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Should You Fish or Cut Bait?

Innovation Spending in a Recession

Report by Charles Plant

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Summary of Findings

Recent recessions in 2001 and 2008 can give us valuable insight into what we should do to optimize the results from innovation spending in this new recession. There is a pattern to what successful firms have done in past recessions and it is as follows:

- Successful firms maintained profits or limited losses by reducing expenses in areas that brought operational efficiency.
- They kept innovation spending constant as a percent of revenue.
- Firms that exited these recessions as winners explored lower risk opportunities in adjacent markets or through incremental innovation instead of dramatic technological change.
- They collaborated with customers, suppliers, and smaller firms to reduce risk and uncertainty.

From an operational perspective, firms need to focus their attention on opportunities with less uncertain market potential and a high net promoter score. In these markets they need to drive product differentiation and improve unit economics.

Fish or Cut Bait

We are just at the beginning of a potentially major economic retraction. While we can't know now what will happen to bring us out of a virus-fueled demand slump, we can learn from past recessions what firms should do about innovating in troubled times. The natural reaction of many firms is to pull back on expenditures in innovation to preserve cash and reduce risk. For others though, this looks like an opportune time to double down on innovation and emerge as a clear winner when things return to normal. But which strategy is right? What can we learn from past recessions that we can apply today?

What Can We Learn from Past Recessions?

The best place to start such an analysis is in the year 2008. The collapse of Lehman Brothers and the credit crunch experienced by other major financial firms led to a crisis that hadn't been matched in size since the Depression in 1929. GDP declined, trade was restricted, unemployment increased in many countries. It took until 2009 for a recovery to begin and it continued in 2010 and 2011, resulting in the greatest bull market of all time.

While the net impact on R&D and innovation from the debt crisis was negative in most countries, the impact was felt differently in different industries. In some countries such as Korea and India, innovation did not decline and opportunities were seized post crisis in a way that benefitted these countries in the long run. Others such as Greece were weakened by the crisis and saw fragile performance after it was over.

The OECD (2012) determined that there were three main factors that influenced innovation performance during the crisis:

- Uncertainties about demand trends strongly inhibited innovation.
- Problems accessing financing were exacerbated by large companies and banks that engaged in a process of deleveraging and hoarding that was detrimental to innovation investment.
- Budgetary pressures rose significantly in many countries and this put pressure on public support for innovation.

During the crisis, innovation performance was affected differently in large versus smaller firms. Larger firms, with more access to capital, were able to accommodate shocks to sales and make fewer cuts to innovation, smoothing investments over time. In smaller firms however, profit margins were more affected and they were more likely to deleverage by discontinuing innovation investments, thus incurring costs in lost human capital and project interruptions (OECD 2012).

What Happened at the Firm Level?

Data from the Great Recession shows that the number of firms that are willing to increase their innovation investment fell from 38% to 9%. (Archibugi et al 2012). Those firms that increased their innovation investments were:

- Smaller than before
- Collaborating with suppliers and customers
- Exploring new markets
- Less likely to compete on costs

One other important finding of this research was that before a crisis firms were more likely to seize technological opportunities, after the crisis they are more likely to look at opportunities in new markets. This strategy of taking existing technology to new markets enables a firm to reduce the uncertainty and risk that accompanies disruptive technological innovation and increases value in the long run.

What is Likely to Happen This Time?

This crisis will have a number of effects that will mirror what was experienced in 2008.

- Demand for products and services, particularly in certain sectors has declined rapidly. The lowered demand will probably reduce demand for more innovative items and durable goods as these purchases can more easily be delayed. Innovative products and services that lower prices may see increased potential.
- Competition may increase as firms seek to maintain sales levels by increasing market share. But at the same time, many smaller firms will exit the market, thereby lowering competition faced by big businesses.
- Cash flow for firms will decline, making investments in innovation more difficult unless external financing is available.
- Since the recovery timeline is unknown, firms may be less willing to accept the risks associated with new product and services introductions.

Essentially what this means is that many firms will be actively trying to manage difficult situations and will be deleveraging or ignoring innovation opportunities. That will leave a market vacuum that will inevitably favour firms that continue innovating all the way through the crisis.

What's the Best Strategy?

Two researchers from the Harvard business School attempted to answer the question of what strategies result in the best return from a recession. (Gulati & Nohira 2010) Their research started in 2008 and they looked at 4,700 companies, breaking down the data into three periods; the three years before a recession, the recession itself and the three years after. Their data which looked at three recessions from 1980 to 1982, 1990 to 1991, and 2000 to 2002 was surprising.

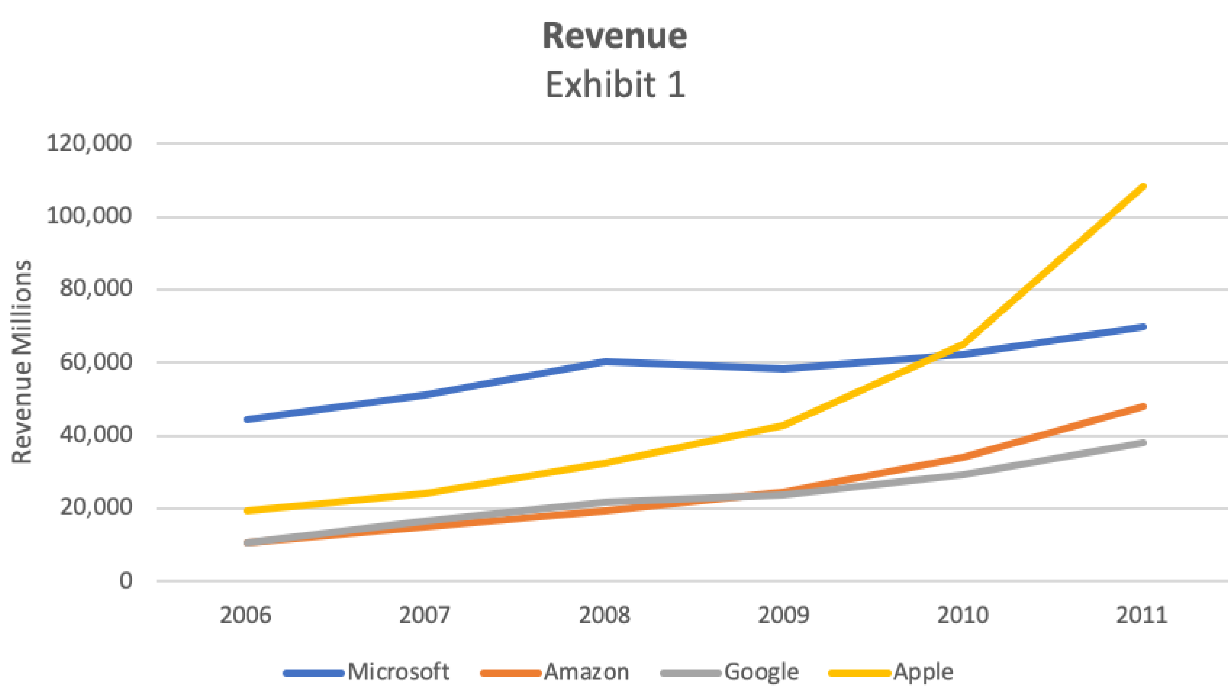
- 17% of the companies didn't survive the recession.
- Only 9% of the companies did 10% better on sales and profit growth after the recession.
- 85% of the growth leaders before these recessions emerged worse off than before.
- Firms that cut costs faster and deeper had the lowest probability of success after.
- Businesses that invested boldly had only a 26% chance of success.

The companies that actually succeeded during a recession were the ones that mastered a delicate balance between cutting costs to survive and investing to grow tomorrow. The costs they cut focussed on operational efficiency and where they invested was in marketing, R&D, and new assets.

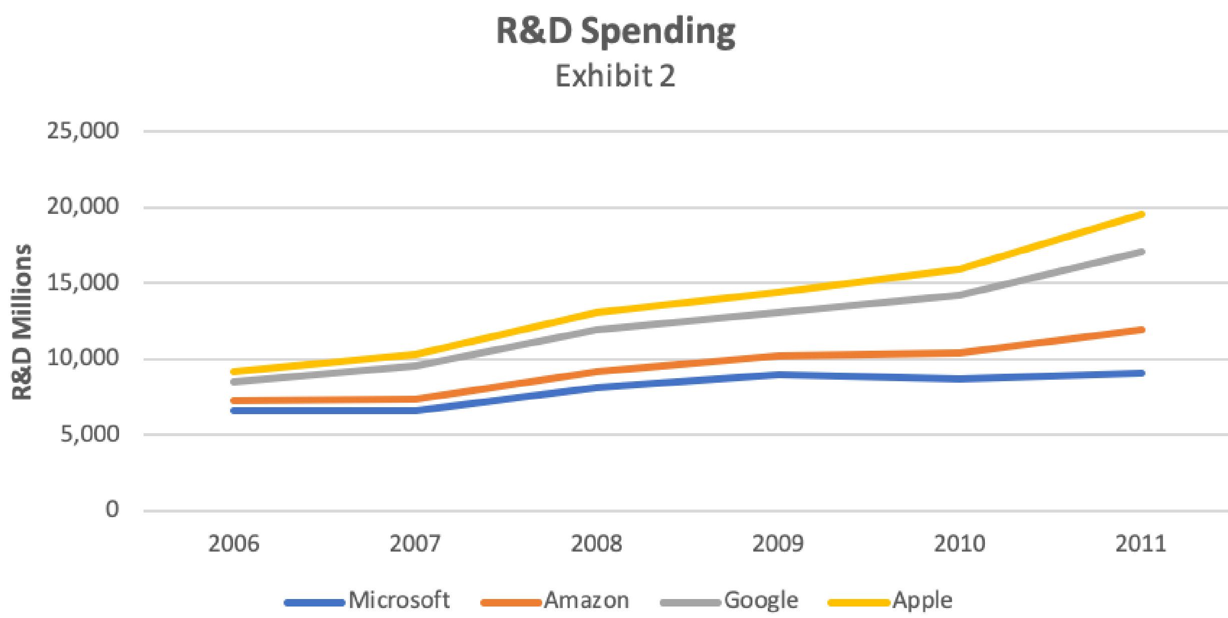
A good example from Gulati and Nohira's study is that of Sony. They went into the 2000 downturn as a leader. They cut their workforce, R&D expenditures and capital expenditures dramatically. The results were an increase in profit margin but sales growth tumbled from an average of 11% before the recession to only 1% after. And they were beaten by companies that did increase innovation expenditures, namely Amazon, Microsoft, Nintendo, and Samsung.

Amazon, Microsoft, Google, and Apple

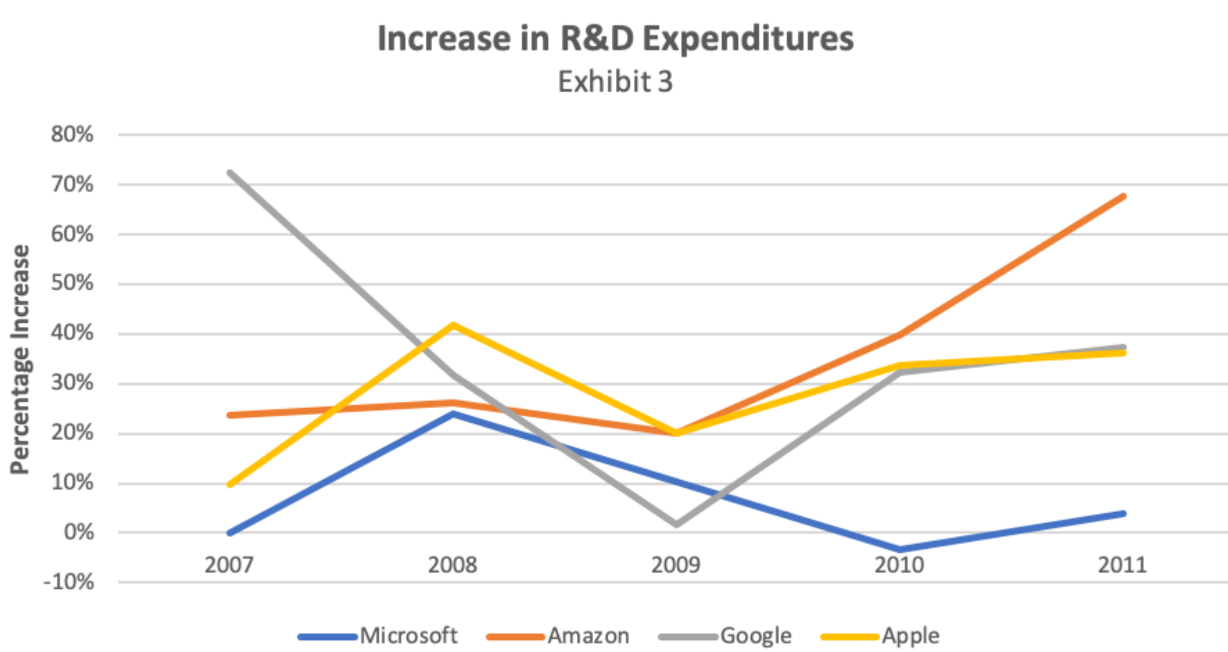
Speaking of Amazon and Microsoft, their expenditures during the 2007/2008 recession are great examples of what companies need to do to be successful in recessionary times. Exhibit 1 shows the changes in revenue for Microsoft, Amazon, Google, and Apple before, during, and after the Great Recession.



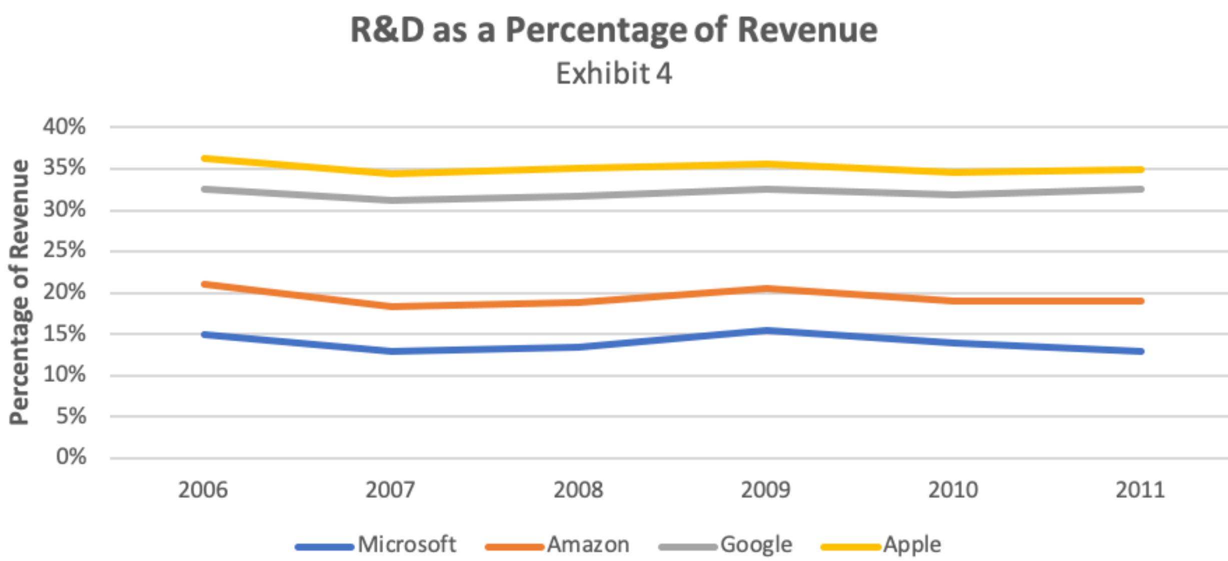
While Microsoft saw its revenue fall during the last recession, the other firms experienced revenue growth, albeit smaller than before or after the recession. In terms of R&D spending, trends are seen in Exhibit 2.



What is instructive to note was that during this period, while the growth of R&D spending declined, only Microsoft actually reduced expenditures. Exhibit 3 shows increases in R&D during the period.



Essentially, what all four of these firms did was to keep R&D expenditures in line with revenue. Exhibit 4 shows how little R&D as a percent of revenue varied during the recession.



It is interesting to note that Microsoft was the only firm of the four that actually reduced expenditures and they were the only ones that had a decrease in revenue. While the revenue decrease might have been the cause of the R&D decrease and not the other way around, of the four firms, they had the lowest percentage of revenue growth post-recession.

The experience of these firms parallels findings from the 2000 recession. During the dotcom bust, many companies reduced headcount and R&D spending. But that's not what Apple did. It spent more on R&D giving itself a head start on innovation. The net result was the introduction of the iPod in 2001. And what followed the Great Recession for Apple? It was the iPad, introduced in 2010.

As Tim Cook said:

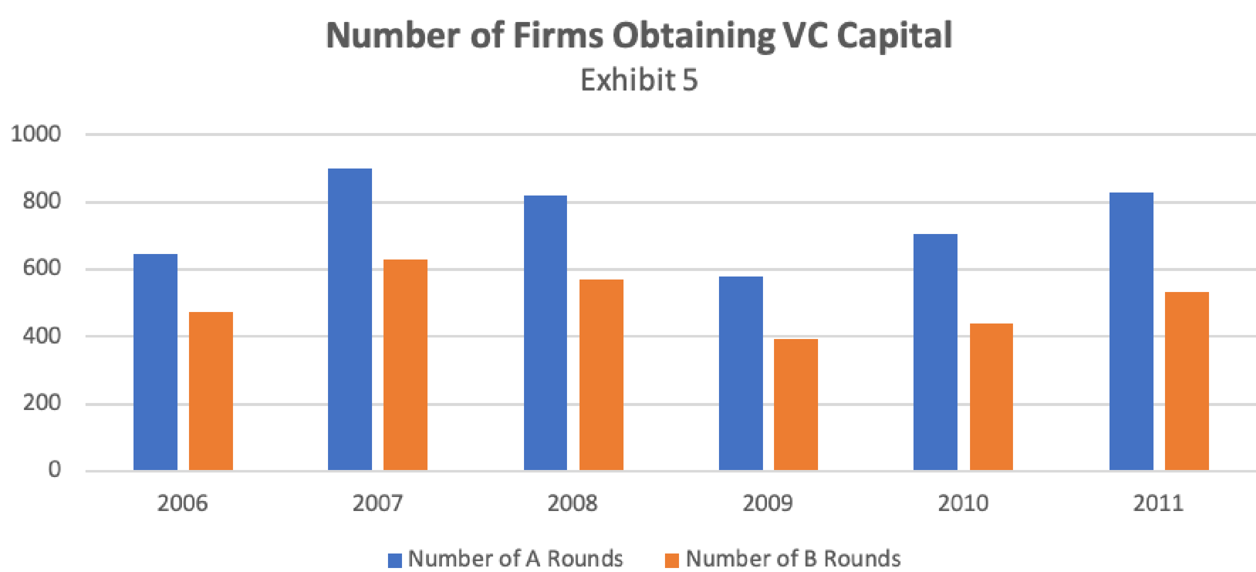
"Our North Star is to remain focused on making the world's best products. Economic turmoil may push us side to side, but we're going to stay on that journey and stay focused on making the best products and not deviate from that."

Why do some firms continue to invest in R&D during a recession?

It comes down to experience. Research (Amore undated) looked at experience as a factor in continued innovation. This research looked at data on listed US firms during economic downturns from the 1980s to 2001. What was found was that "firms that increased innovative effort during past downturns are significantly more likely to invest in R&D expenditures when a new recession hits." A firm's experience with innovation during normal years does not seem to affect their behaviour during a recession. Firms that had past experience with recessionary innovation typically show better patent outcomes and innovation efficiency after a new recession.

What About Smaller Firms?

Data from Crunchbase show a very distinct pattern regarding the ability of smaller firms to innovate during a recession. Exhibit 5 shows the number of firms that obtain Series A and Series B capital before, during and after the Great Recession.



The first impact of the stock market decline in 2007 was a small reduction in the number of firms financed in 2008. Then the crash itself significantly reduced the number of firms getting capital. This number began to pick up again in 2010. Not only were fewer firms obtaining capital, they were raising smaller rounds on average. In addition, the size of the average round and the valuation decreased. The net result is that there will be less competition for larger firms coming from new market entrants during the upcoming recession.

The Opportunity for Larger Firms

A first innovation vacuum is created when many larger firms become distracted and actually reduce innovation spending. The second vacuum is created when smaller firms become constrained by reduced capital. This results in a large opportunity for firms that maintain or increase their innovation investment. This opportunity will tend to favour:

- Countries that emerge more quickly from the crisis
- Industries with less demand reduction
- Larger firms
- Firms with a history of innovating through the last recession.
- Firms that collaborate with customers, suppliers and smaller firms

A Foundation for Successful innovation

Bringing any innovation to the market is a complex process. There are four elements that are an essential foundation for the successful launch of innovative products and services:

- A large market
- Strong competitive differentiation
- Excellent product/market fit
- Good unit economics

Unfortunately, it is likely that with the recent issues facing the world, this foundation has changed. The first thing you must do is check to make sure your market is still there. Market research will enable you to determine whether the market is still there, has gone dormant and will return or will never return. As an example, in the current situation, if you are hosting large educational conferences, the market has gone completely dead except for webinar based conferences which may be increasing. In the shorter run, smaller local or even national conferences will come back at some point in time but one cannot determine now how long it will take for large international conferences to return if they ever will.

One way at looking at whether a market is still there is looking at what triggers a person or a company to buy anything. The best way to think about triggers is to classify them based on their degree of urgency and importance. People prioritize how they will handle opportunities for purchasing innovative products and services.

Fundamentally, they assign priorities to one of these buckets, typically dealing with the urgent before the non-urgent and the important before the unimportant. You can classify triggers into these quadrants very easily. There are four types of problems that people experience and each of these problems results in a corresponding trigger:

Urgency and Importance

Exhibit 6

	Urgent	Not Urgent
Important	**Urgent and important** Operational problems	**Important but not urgent** Strategic Problems
Not Important	**Urgent but not important** Regulatory Problems	**Not urgent and not important** Financial Problems

While management theorists will say that you should place a higher priority on Important Problems than Urgent Problems, in the real world, that's not what companies and people do. They will deal with the Urgent before the Important, thus solving problems in normal economic times in this order:

Order of Importance of Triggers – Normal Times

Exhibit 7

Operational	Fixing something that is broken to enable a firm to run or a family to eat
Regulatory	Meeting a regulation for example on pollution
Strategic	Developing a new product to get the jump on the competition, improving process
Financial	Saving costs

For most firms in recessionary times though, saving money, which used to be not important and not urgent becomes important and urgent. Keeping the lights on, or dealing with operational problems is still the most important thing for companies to do as saving money isn't really worth it if the assembly line isn't working or the server has crashed. Thus, in recessionary times, the order in which firms do things becomes changed to the following:

Order of Importance of Triggers – Recessionary Times

Exhibit 8

Operational	Fixing something that is broken to enable a firm to run or a family to eat
Financial	Saving costs to ensure the firm survives
Regulatory	Meeting a regulation for example on pollution
Strategic	Developing a new product to get the jump on the competition, improving process

What this means is that in recessionary times, customers will put aside strategic initiatives in favour of cost saving initiatives. If you are trying to sell a product that meets a highly strategic need then it is unlikely that it will generate much in the way of sales in a tough recession. How it fares after the recession is anybody's guess and it depends on what structural changes occur in the interim.

In choosing which innovative projects to focus on, a company needs to decide whether it wants short term cash or long term strategic advantage. If it is short term cash, then focus on projects that meet customers operational and financial needs. If the company is financially stable, able to meet financial obligations during a recession, then the best thing to do is to focus on projects that meet the strategic needs of customers as these will put the company in the best position when times return to normal.

Focus on your best potential market segment

If there are projects that meet the criteria established above, then the next decision is which market segments to explore. Many product and service innovations are targeted simultaneously at multiple market segments as they are launched in order to reap the benefits of higher growth from a multi-pronged strategy.

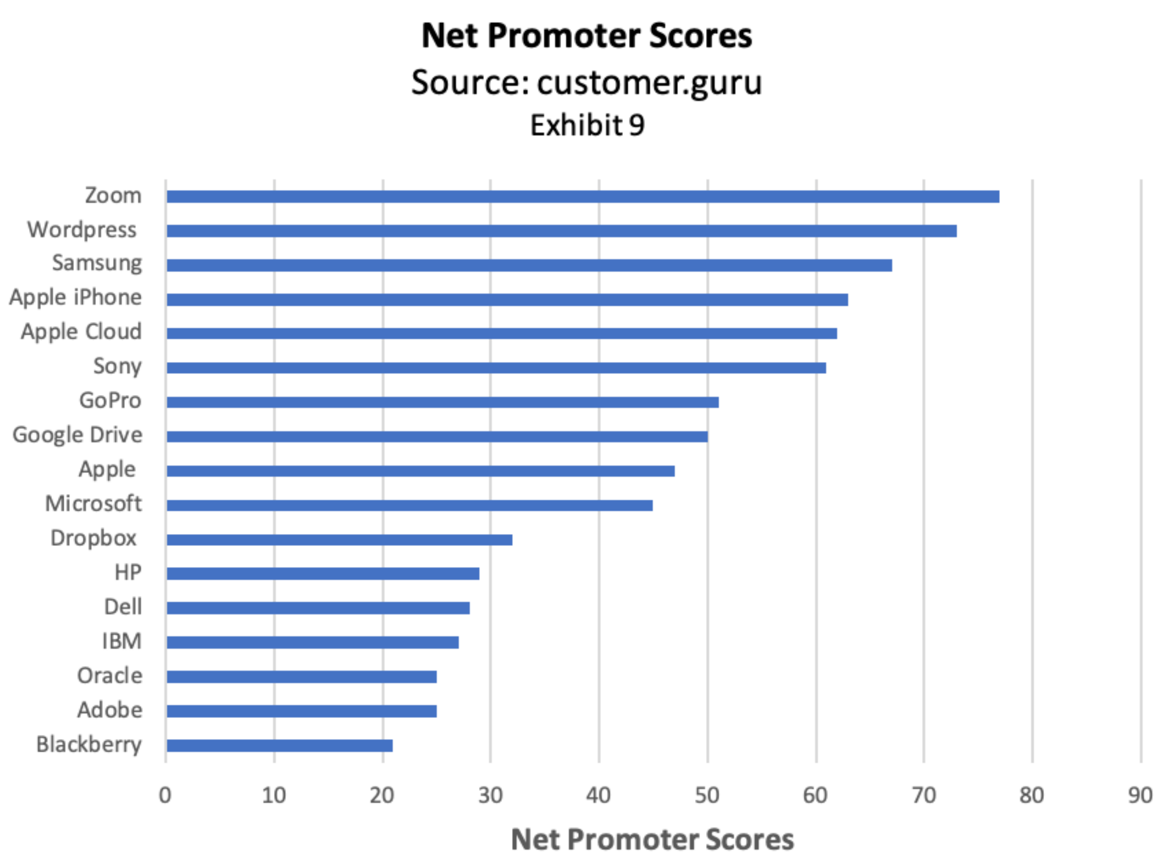
Instead, when you need to conserve cash a company that still supports innovation should be focussing on its best target market segment or user persona. In this way it will maximize its growth rate for the lowest potential cost.

The method to do that is to calculate the Net Promoter Score (NPS) for each of your target market segments. NPS measures customer experience through the use of a 10 point scale used to answer the question: “How likely is it that you would recommend (your startup) to a friend or colleague?” Respondents are grouped into:

- Promoters (score 9 – 10) - loyal enthusiasts
- Passives (score 7 – 8) satisfied but unenthusiastic customers
- Detractors (score 0 – 6) unhappy customers

To calculate the NPS, you subtract the percentage of detractors from the percentage of Promoters, getting a score that is between -100 and 100.

When you measure the score among all customers, you will hopefully obtain a small but positive score. The key to segmenting your clients is to find patterns of customers that as a subset, would have a much higher NPS. Some commentators say that you need an NPS of at least 60 to show product market fit although that is perhaps excessive when you see what major companies manage to score. The following chart shows the NPS of major tech firms.



It is interesting to note that many of the older, more established companies have an NPS of below 30 and many more popular ones have a score above 40. Without attempting to make a value judgement regarding a target score, if you can find a segment of your customers that has an NPS of above 40 then this is the segment you should be targeting in a focussed campaign for innovative products or services. In any case, pick the largest segment possible with the highest NPS to concentrate your efforts on.

The what should R&D do?

Remember that innovative products need a firm foundation before they can be scaled. Your new targeted segment should still be sufficient to support growth over the next few years until purse strings are loosened or economics return to normal. What R&D needs to do is to is to focus on competitive differentiation. Knowing your targeted segment, R&D needs to build product capability first in that area that most increases the ability of the firm's product to be differentiated from the competition by customers. This might be by enhancing quality or speed on some dimension or by reducing cost, whatever it is your strategy is for differentiation. The result of this will hopefully be an even higher NPS.

To do this, you should be able to measure competitive differentiation on the same basis that customers will measure it. It is often difficult to measure differentiation but market research and asking customers how they rate your product to competitive ones on a number of different bases will enable you to develop a scoring system against which you can target and track progress.

Dimensions of Product Differentiation

Exhibit 10

Quality	Speed	Cost
Performance	Transaction	Capital
Features	Delivery	Operating
Reliability	Implementation	Fixed
Conformance	Learning	Variable
Durability	Support and Service	
Service		
Design		
Vendor Experience		
Vendor Knowledge		

As there are many barriers to getting customers to accept innovative products, it is essential that any product or service differences are material and overcome those barriers. For more information on triggers and differentiation see Triggers and Barriers: A Customer Perspective on Innovation (Plant 2018). By focussing on products or services with the highest product market fit and then doubling down on product differentiation, a company can create an insurmountable lead in recessionary times. It can also attack weak spots in adjacent markets.

Spending on intellectual property is seen as strategic and not operational in nature and can often be put on the back burner in times like these. Those firms treating this opportunity aggressively can do so now by evaluating the company's intellectual property and patent portfolio. If the company needs to pivot in some markets, what existing intellectual property can be capitalized on to augment products in adjacent markets? And if the firm is actively creating greater product differential, how can those differences be patented to increase the company's strategic advantage.

What should Marketing & Sales do?

Going back to the four essential elements that a firm needs to prove before it can scale a product or service, the strategy outlined so far addresses market size, competitive differentiation, and product market fit. The last element to address is unit economics. Simply put, unit economics are the direct revenues and costs associated with a particular business model, expressed on a unit basis where the customer is the unit. For companies that sell products, items that are measured in unit economics include:

- Customer Lifetime value (LTV)
- Customer acquisition cost (CAC)
- LTV:CAC ratio

One measure that is simple and is often quoted as a benchmark is LTV/CAC. Many commentators have determined that an LTV/CAC of greater than 3 is a level above which a firm is doing well and below which a firm is challenged. The precise number will actually be different for every firm depending on its cost structure. This is a useful tool though in choosing between projects, setting objectives, and determining progress with product launches.

Companies that sell a service can look at three elements of customer retention to evaluate unit economics. These are all expressed as a percentage of initial annual or monthly sale:

- Logo Retention – The percentage of customers maintained over time
- Gross Dollar Retention – The dollars from those customers retained over time
- Net Dollar Retention – the total revenue minus any revenue churn (caused by departing customers, or customers who have downgraded) plus any revenue expansion from upgrades, cross-sells or upsells.

Of these three, net dollar retention is perhaps the most important metric and firms should target 100% retention to ensure consistent growth.

What is the Recipe for Success?

From past experience, one can see a pattern that shows what successful firms have done in past recessions. The recipe for success for innovation in this recession should be to:

- Maintain profits or limit losses by reducing expenses in areas that bring operational efficiency.
- Keep innovation spending constant as a percent of revenue
- Explore lower risk opportunities in adjacent markets or through incremental innovation instead of dramatic technological change.
- Collaborate with customers, suppliers, and smaller firms to reduce risk and uncertainty.

From an operational perspective, firms need to:

- Re-examine predictions as to market size and choose innovation projects that have a less uncertain potential.
- Focus on market segments that have a high net promoter score.
- Look for opportunities to improve product differentiation
- Focus on improving unit economics.

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About Charles Plant

Charles Plant | Founder, The Narwhal Project

Charles Plant is a serial entrepreneur and innovation economist. As founder of The Narwhal Project, he is conducting research in order to understand what it takes to create a world class technology company. Aside from numerous research papers he has recently written a book that is available on Amazon entitled Triggers and Barriers: A Customer Perspective on Innovation.

Charles has been an officer, director or investor in over a dozen technology companies. He was co-founder and CEO for 15 years of Synamics, a telecommunications software firm that provided mass calling platforms to telcos. Active for much of his career in the world of finance, Charles has been a venture capitalist, investment banker, and corporate banker. He also worked for four years at MaRS Discovery District.

As an educator, Charles spent seven years on the faculty of York's Schulich School of Business teaching in the MBA program and has taught innovation and entrepreneurship at the University of Toronto. He has an MBA in marketing, is a Chartered Accountant and is currently pursuing a PhD in Economics.

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Communitech helps tech companies start, grow and succeed in three distinct ways:

- Communitech is a place – the centre of gravity for entrepreneurs and innovators. A clubhouse for building cool shit and great companies.
- Communitech delivers programs – helping companies at all stages with access to capital, customers and talent. We are here to help them grow and innovate.
- Communitech partners in building a world-leading ecosystem – making sure we have all the ingredients (and the brand) to go from a small startup to a global giant.

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