A Study of Corporate Entrepreneurship in the Semiconductor Industry

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ABSTRACT

The number of semiconductor companies receiving venture funding has been decreasing through-out the last decade. The economics of manufacturing semiconductors do not offer an attractive risk-reward profile to the traditional VC model of investing. Moreover, fewer significant positive funding outcomes have further pushed VCs away from this space.

Stagnant in-house R&D, dying start-up ecosystem have led the large corporations to consider corporate entrepreneurship to boost the innovation possibilities. In the past 20 years, many large semiconductor corporations have established corporate venture capital units and other initiatives to foster innovation and growth, while putting idle cash on the balance sheet to good use. However, corporate entrepreneurship has seen a mediocre performance with many initiatives not yielding the desired success.

This thesis focuses on Corporate Entrepreneurship, with a special emphasis on Corporate Venture Capital (CVC) in the Semiconductor industry. Primarily relying on interviews and secondary research, it attempts to study some of the more successful CVCs in the industry, and understand, the key traits that have made them successful, and how they tackle the challenges facing the industry.

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Introduction

"Open Innovation" has emerged as one of the corporate buzz words for tapping into external innovation. It is a concept that has been deployed by many companies and refers to the search for promising ideas outside of the organization. This also involves combining internal and external resources and activities like ideas, people and opportunities to formulate a high growth strategy.

If a corporation's ability to develop and acquire valuable resources and capabilities is largely related to finding knowledge external to the firm and integrating it with internal knowledge, the question arises around the best way to source external knowledge. Many companies pay high level of attention to recruitment of skilled talent, partnerships, university collaboration, and M&A activities. While all of these can be critical sources, this study will focus on the role of corporate entrepreneurship as a tool to foster innovation and more particularly on its role in the semiconductor industry.

Corporate Entrepreneurship can be attributed to various activities within a corporation, however the following two distinctions need to be considered in its definition:

- Corporate Venture Capital (CVC) is equity investment by established companies in independent entrepreneurial ventures that are seeking capital to expand or continue operation. This investment is generally a passive, minority stake in the investee entity.
- Corporate Entrepreneurship is a broader term that refers to the approach adopted by established and large corporations, that allows them to tap into, and eventually harness, external sources of new businesses, products, and technologies. CVC is essentially a subset of Corporate Entrepreneurship. Corporate Entrepreneurship can also include investments that are aimed at building new and independent businesses from within the

current corporation with the intent of spinning the entity out and relating the new start-up to the core business of the larger corporation – this is business incubation.

This study will address Corporate Entrepreneurship activities with a particular focus on Corporate Venture Capital (CVC).

High capital requirements, consolidation, and decreasing presence of VC firms are just a few of the challenges for investment in the semiconductor industry. Recent economic conditions have exacted a toll on the CVC industry as well. Many of the large semiconductor corporations that initiated corporate entrepreneurship programs at the peak of the public markets are not able to sustain their venturing activities in the face of pressure to preserve cash.

Still, in the midst of this crisis, a number of CVCs have quietly and consistently managed to become sources of innovation and success in corporations around the world. They continue to demonstrate their unique role in enhancing the parent corporation's prospects for global growth. These Corporate Entrepreneurship programs seemed to have positioned themselves for success by following a dedicated set of principles and adapting to changing market conditions.

This study focusses on identifying keys to creating and sustaining a successful corporate venturing program in the semiconductor industry. In an industry as complex as semiconductors, it is not very easy to pin-point generally applicable best-practices, but effort has been to made to gather a significant amount of information from successful semiconductor CVCs, which provided some useful insights to succeed ranging from the development of a well aligned strategy, to the implementation of an effective structure and investment process. Some specific points examined include the role of the CVC in enhancing the global presence of its parent company, the importance of leveraging parent company resources, methods of enhancing integration with business units, and methods for measuring the strategic return on investments.

Research Methodology

The main objectives this study seeks to address are threefold:

1. Understand how various top semiconductor companies approach corporate entrepreneurship – many companies try and achieve different objectives with corporate entrepreneurship and this study seeks to address these different approaches for a selection of semiconductor companies.
2. Identify key success factors and challenges in corporate entrepreneurship – this study seeks to highlight how certain companies have designed their corporate venturing programs to capitalize on the success factors of corporate venturing and to address the challenges that need to be resolved.
3. Obtain insight on benefit and challenges of corporate entrepreneurship – corporate entrepreneurship has been successful at some companies and has failed at others, so this study will seek to identify the key benefits that can emerge from and the risks of corporate venturing.

This study explores the cases of Intel Capital, Qualcomm Ventures and Cisco Investments, three leading CVCs in the semiconductor industry that have created effective operating structures to address the challenges and demonstrate the success factors. These companies take very different organizational approaches. Intel and Qualcomm adopted a "traditional venture capital fund in a company" model, while Cisco has its CVC unit work very closely with its business units.

Information included in this report was obtained through detailed interviews with investment professionals at select investment firms of semiconductor companies (Intel Capital, Qualcomm Ventures, and Cisco Investments), with a lot of supporting material obtained from databases,

industry reports, academic articles, and press releases. Also, the investment data has been obtained from Thomson One Venture database, National Venture Capital Association (NVCA), Seedtable CVC database and CB Insights.

Structure of the study

This study starts with an overview of the semiconductor industry, its key trends and characteristics, and the investment trends in the industry with an in-depth focus of Corporate Entrepreneurship. Next, it deals with case studies of the key players in the industry – Intel Capital, Qualcomm Ventures, and Cisco Investments. Finally, the key findings from the case studies are analysed, with a focus on identifying the secret sauce which has helped these CVCs become successful and its implications on the semiconductor industry. The objectives, processes, and operations of various corporate venturing organizations will be explored to address the question of how companies should focus on the success factors and tackle the challenges facing the industry.

Semiconductor Industry

Overview

The Semiconductor Industry is the aggregation of all the companies involved in design and manufacture of semiconductor devices. In 2014, the Global Semiconductor and Electronic Parts Manufacturing industry is expected to generate $755.2 billion in revenue (IBISWorld Industry Report 33441a, Nov 2013). This will mark the fifth consecutive year of growth, as the industry recovers from the 2009 slump. Growth has been prompted by increasing sales volumes of new computer and consumer electronics products; the growing use of electronics in home appliances, communications and automobile products and the rising application of electronics in industrial production, such as in automation and control.

1H13 Rank	2012 Rank	Company	Headquarters	2012 Tot Semi
1	1	Intel	U.S.	49,114
2	2	Samsung	South Korea	32,251
3	3	TSMC*	Taiwan	16,951
4	4	Qualcomm**	U.S.	13,177
5	8	SK Hynix	South Korea	9,057
6	6	Toshiba	Japan	11,217
7	5	TI	U.S.	12,081
8	10	Micron	U.S.	8,002
9	9	ST	Europe	8,364
10	11	Broadcom**	U.S.	7,793
11	7	Renesas	Japan	9,314
12	15	GlobalFoundries*	U.S.	4,560
13	14	Infineon	Europe	4,928
14	16	NXP	Europe	4,325
15	13	AMD**	U.S.	5,422
16	12	Sony	Japan	5,709
17	24	Elpida***	Japan	3,075
18	22	MediaTek**	Taiwan	3,366
19	20	UMC*	Taiwan	3,730
20	19	Freescale	U.S.	3,803

Figure 1 – Top Semiconductor Companies by Sales; Source: IC Insights

The semiconductor industry runs by a simple principle, to produce smaller, faster and cheaper devices. The key benefit from this principle being – the smaller the transistors, more transistors can be packed on a chip, and more the transistors, faster the chip. And thanks to fierce competition, and newer technologies, there is a lot of pressure on the chip average selling price (ASPs). As a result, chip makers constantly go back to the drawing board to come up with superior products, in order to stay competitive and maintain revenues and margins.

Industry attractiveness - Porter's 5 Forces Analysis

Threat of New Entrants. The threat of new entrants is currently low. In this capital intensive industry, it requires billions of dollars in investment to set up chip fabrication units. As the industry shifts to a complete fabless model, the threat increases slightly. However, unlike software/ internet based companies, the costs of setting up a new company are significantly higher, IP with established players and limited availability of highly talented designers, engineers further keeps the threat of new entrants low.

Power of Suppliers. The power of suppliers is considerable in this space. Large semiconductor companies, mitigate this risk by contracting with multiple suppliers. However, as the production becomes expensive, many companies increasingly become dependent on a few particular chip suppliers/ manufacturers, thus increasing the power of suppliers. As the suppliers of cutting-edge equipment and production skills, merchant foundries enjoy considerable industry bargaining power. Some of the large chip foundries like TSMC (Taiwan Semiconductor Manufacturing Corporation), UMC – United Microelectronics Corporation, GSMC – Grace Semiconductor Corporation, IBM hold a good amount of bargaining power with semiconductor companies.

Power of Buyers. Many of the industry's key segments are dominated by a small number of large players. This means that buyers have certain bargaining power. For example, microprocessors are primarily purchased by PC and consumer good manufacturing companies like Dell, HP, and Apple etc. Given their size they would have certain bargaining power in terms of pricing and exclusivity.

Availability of Substitutes. The threat of substitutes in the semiconductors industry really depends on the segment. While intellectual property protection might stop the threat of new

substitute chips for a period of time, generally within a short period of time, companies start to produce similar products at lower prices. There is also a growing trend of counterfeit/ copy-cat products in the market. For example, a company that spends millions, if not billions, of dollars on the creation of a faster, more reliable chip will strive to recoup the R&D costs. But then along comes a player that reverse engineers the system and markets a similar product for a fraction of the price. In the short-term there is minimal threat of substitutes, however the increasing trend of copy-cat products in the market is increasing the threat in the long run.

Competition/ Rivalry. The industry is marked by intense rivalries between individual companies. There is high pressure on companies to come up with something better, faster and cheaper than what redefined the state-of-the-art only a few months before. That pressure extends to chip makers, foundries, design labs and distributors – everyone connected to the business of bringing chips from R&D into high-tech equipment. The result is an industry that continually produces cutting-edge technology while riding volatile business conditions. However, certain segments of the industry also are characterized by low competition. For example, PC microprocessors has essentially 2 companies competing for the market share, Intel and AMD.

In conclusion, the industry can be best described as a growth venue. The sector is definitely, not as high-flying as it once was, but it does still seem to exhibit better-than-average expansion characteristics. Competition is intense, with product innovation, fuelled by aggressive research & development (R&D), paving the way for increased profitability.

Key Industry Characteristics

The Semiconductor Industry is highly cyclical in nature. During times of economic prosperity, the chip sector thrives, thanks to increased spending by consumers and businesses. However,

during economic downturns revenues come under pressure, as corporate IT budgets are reduced and consumers hold off on purchasing the latest devices. The key industry characteristics include –

1) High Capital Intensity

- High capital start-up costs
- Short manufacturing equipment replacement cycle

This industry requires substantial amounts of capital investment. For every dollar spent on labour, the industry spends about $0.89 on capital (IBISWorld Industry Report, Nov 2013). The rate of technological change within the industry is high and increasing, therefore significant investment in capital is expected to continue. However, capital intensity varies by product segment. Segments involving a relatively higher level of capital intensity include semiconductor and display panel fabrication, while activities involving relatively lower levels of capital intensity include the manufacture of passive devices, printed circuit boards, flexible printed circuits and semiconductor assembly and testing operations

2) The level of technology change is high

New developments in electronic component technologies can make end-products significantly cheaper, smaller, faster or more reliable than their predecessors and enable, through their timely appearance on the market, significant value creation opportunities. For this reason, many companies in this industry devote significant effort to research & development.

3) Need for Continuous Innovation

Moore's law sets the pace for innovation: The continual improvement in semiconductor technology can be expressed in the concept of Moore's Law, named after Gordon Moore, a

cofounder of Intel. In 1965, Dr. Moore observed that, since the invention of the IC in 1958, the number of transistors on a chip had doubled every year, and he predicted that the trend would continue "for at least ten years." His prediction has proved to be uncannily accurate for nearly half a century, in part because the law is now used in the semiconductor industry to guide long-term planning and set R&D targets. (The doubling period is sometimes noted as every 18 months, though that timeframe refers to a doubling in chip performance—a measure that combines the effect of more transistors and their being faster—that was predicted in 1975 by Intel executive David House.). Key characteristics of the need for continuous innovation include -

- There is fast technological change in this industry, supported by high levels of R&D
- Product innovation is a key feature of this industry, with new products released at a rapid pace
- The demand for final electronic products is burgeoning

Hence, product innovation is very important, since consumers crave the newest offerings. Consumer discretionary items, such as cellular phones, digital televisions, and portable music players, are upgraded every year or more, giving customers many options to choose from. Technological innovation results in intense pressure to bring interesting products to the marketplace in a timely manner. Additionally, consumers tend to buy advanced new products long before the old ones are dysfunctional. Many semiconductor companies also supply silicon devices to the businesses. This generally involves long-term, definitive contracts. Innovation is a key factor here, as well. During prosperous economic times, corporations upgrade their networks and replace equipment.

2013 Rank	2012 Rank	Company	Region/ Country	Type	2012 Sales ($M)	2012 R&D ($M)	R&D/ Sales	2013 Sales ($M)	2013 R&D ($M)	R&D/ Sales	13/12 R&D
1	1	Intel	Americas	IDM	49,114	10,148	21%	48,321	10,611	22%	5%
2	3	Qualcomm	Americas	Fabless	13,177	2,655	20%	17,211	3,395	20%	28%
3	2	Samsung	South Korea	IDM	32,251	2,765	9%	34,378	2,820	8%	2%
4	5	Broadcom	Americas	Fabless	7,793	2,318	30%	8,219	2,486	30%	7%
5	4	ST	Europe	IDM	8,364	2,413	29%	8,044	1,816	23%	-25%
7	9	TSMC	Taiwan	Foundry	16,951	1,370	8%	19,850	1,623	8%	18%
6	8	Toshiba	Japan	IDM	11,217	1,710	15%	11,958	1,560	13%	-9%
8	7	TI	Americas	IDM	12,081	1,877	16%	11,475	1,522	13%	-19%
9	13	Micron	Americas	IDM	8,002	909	11%	14,433	1,487	10%	64%
10	6	Renesas	Japan	IDM	9,314	1,901	20%	7,975	1,343	17%	-29%

Figure 2 – Semiconductor R&D spending leaders; Source: IC Insights

Investment Trends

Rapid decline of VC funding to semiconductor start-ups

An analysis of US VC funding from 1995 to the first quarter of 2014, based on the information from PwC/ National Venture Capital Association data reveals that the ratio of semiconductor VC deals to the total number of VC deals each time period has been steeply declining. (Figure 3)

Furthermore, according to GSA and Pagemill partners, the number of semiconductor start-ups receiving initial funding has been decreasing through-out the last decade. 44 semiconductor companies got initial funding in 2003 compared to only 3 companies in 2011.

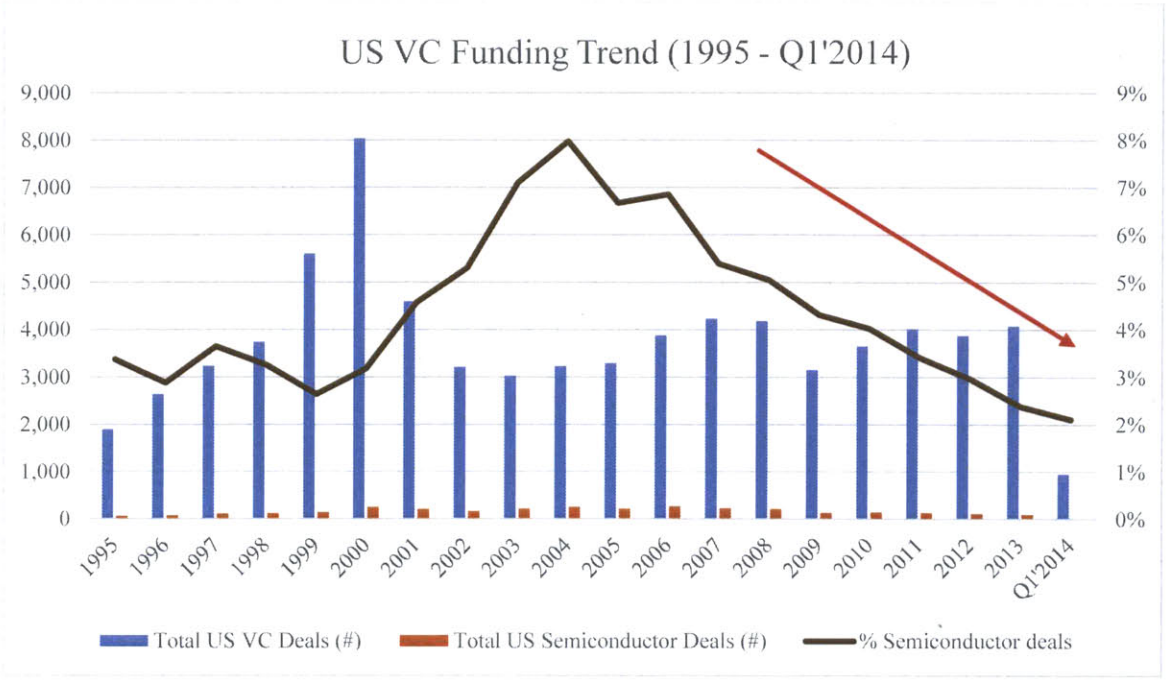

Figure 3; Data Source: PwC/ National Venture Capital Association MoneyTree Report, Thomson Reuters

VCs are less inclined to invest in this industry because -

Complex & Capital Intensive: The economics of manufacturing semiconductors do not offer an attractive risk-reward profile to the classic VC model of investing.

Few significant positive outcomes: IPO's and high valuation acquisitions have declined in the last few years. For example, the year 2011 only saw 6 M&A transactions and 3 IPOs, compared to over 20 M&A transactions and 9 IPOs in the year 2000.

Global Semiconductor Alliance (GSA) says *"The lack of semiconductor start-up funding is already having a large and adverse impact on the growth of the overall semiconductor industry – we must find a solution. The GSA is fully committed to solving this start-up funding issue, an absence of start-ups means a lack of innovation."*

Even who's who of the industry have expressed concern regarding the drying up of VC money to the start-up ecosystem. Lip Bu Tan, CEO of Cadence Design Systems says "Collaboration and more semiconductor VC investment is what's needed to continue innovation in the high tech space."

An analysis of funding from corporate venture capital funds in the industry shows us that CVC money (Figure 4) has been very business cycle dependent. In the good years, the funding even reached as high as 14% of the total VC funding share. However, in distress years the funding levels have fallen below 8% and have not been consistent over the years. After the credit crisis in 2009, the CVC funding seemed to have recovered and has been increasing as the economy improves.

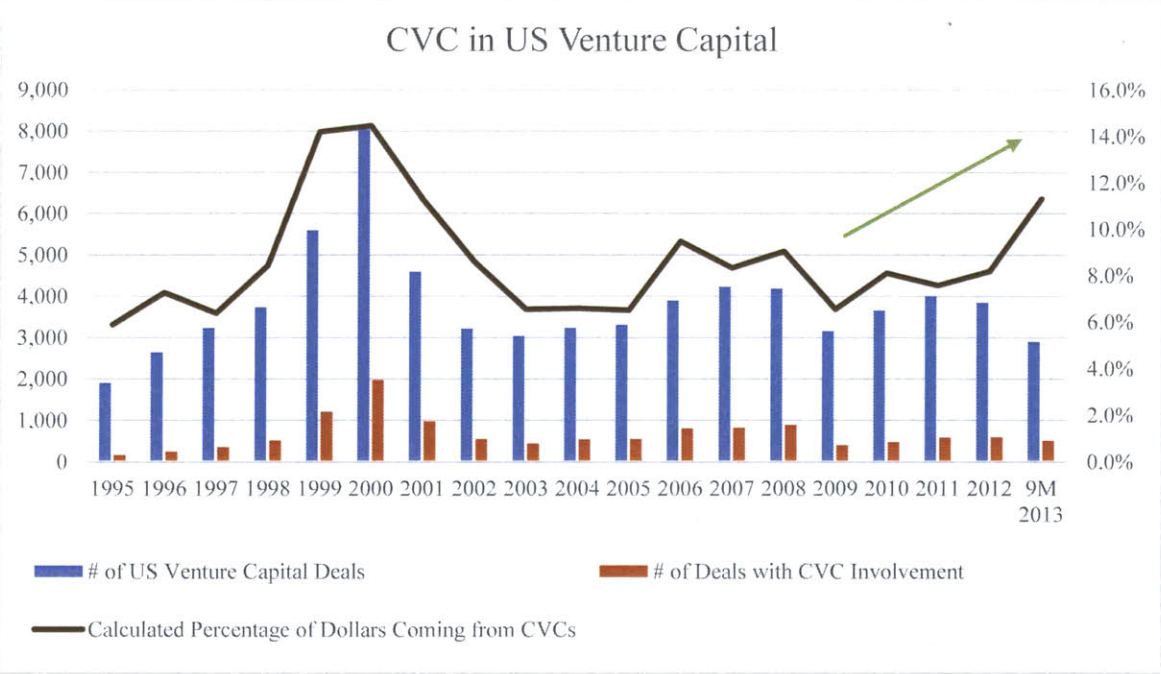

Figure 4; Data Source: PwC/ National Venture Capital Association MoneyTree Report, Thomson Reuters

CVC funding metrics are dependent on the industry.

In order to test this hypothesis, an analysis of the CVC funding in 2013 has been done by industry segments. As seen in the Figure 5, Semiconductors industry has the highest CVC involvement across all the deals at around 25%. Other sectors with high CVC involvement include telecommunications and computers and peripherals. This is in line with the argument that industries with high capital intensity, constant need for innovation generally have higher levels of Corporate Entrepreneurship. Another observation that came up from this analysis is that the areas with high CVC involvement are complementary and adjacent to the semiconductor space. This can also be noticed from the investment portfolios of major semiconductor players like Intel, Samsung.

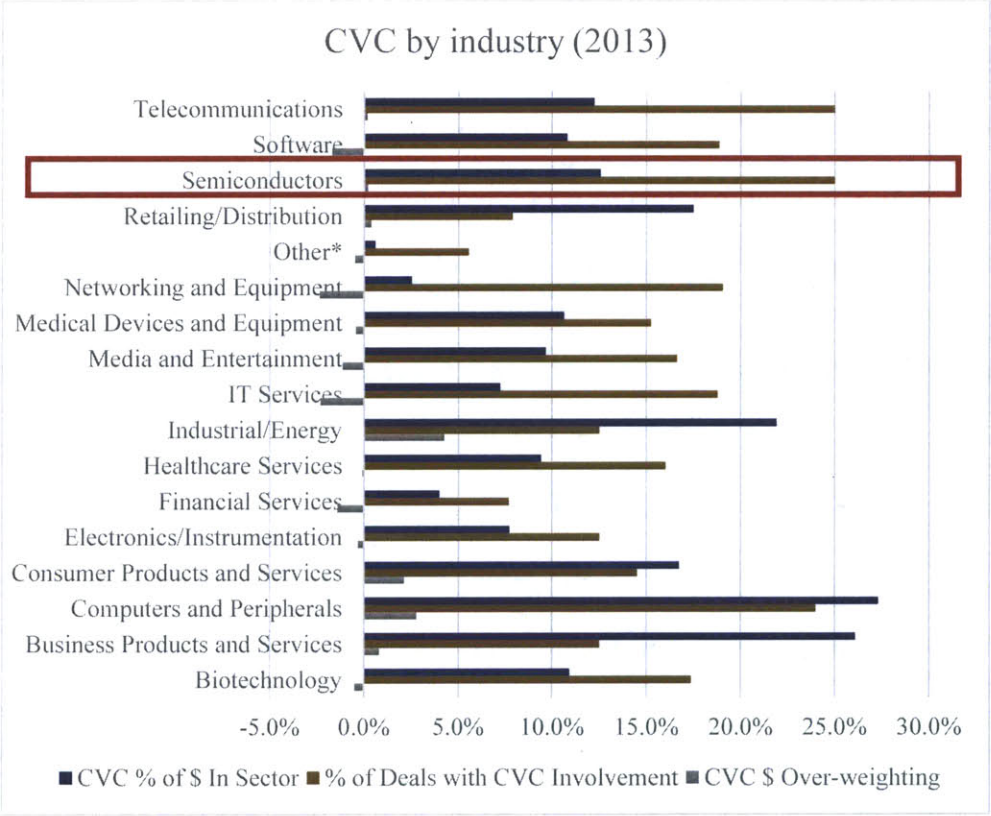

Figure 5; Data Source: PwC/ National Venture Capital Association MoneyTree Report, Thomson Reuters

Corporate Entrepreneurship

Corporate Entrepreneurship is the catch-all phrase used to describe a wide variety of investment/ innovation efforts undertaken by large corporations. Corporate Venture Capital (CVC) describes an equity investment made by a corporation, or its investment entity, into a high growth and high potential, privately-held businesses. This makes CVC appear similar to traditional venture capital, and in many ways they perform the same economic role – the identification and nurturing of the innovative businesses of the future. However, while the structure and practice of venture capital is very similar from firm to firm, the structure and practice of CVC is enormously diverse, as each unit is adapted to work harmoniously with its corporate parent's culture and strategic objectives.

Ecosystem Venturing supports and encourages a company's network of customers, suppliers and complementary businesses. This type of venturing is appropriate when the existing business is dependent on the vibrancy of the community of complementary business and the entrepreneurs in the community do not have sufficient support from existing VC players.

Innovation venturing improves effectives of some part of company's activity. Often but not exclusively this applies to R&D. Most of the idea generation is done internally, but it also comes from external sources. The unit rewards people for the value added, and invests in many projects to spread risk, uses joint ventures and links to venture capital industry, and sets stage-gate targets (milestones) to help assess progress and for further funding.

Harvest venturing increases a company's cash resources by harvesting company's existing assets like technology, IP or other assets. In some cases, the spare resources could be sold.

Private Equity Venturing diversifies a company's business into Venture Capital space, where it invests in start-up businesses like it were an independent venture capitalist. There is no guarantee that the unit will assist the existing businesses or find a new growth platform to add to the portfolio.

In general, there are two main objectives to corporate venturing: 1) developing the strategic capabilities of the parent corporation; and 2) providing a source of financial return for the parent corporation. Generally, CVC programs are designed to sit somewhere on this spectrum.

How does CVC differ from traditional VC?

While CVC has elements in common with venture capital (VC), it also has points of difference. Private venture capital is a singular pursuit; the General Partners (GPs) of the VC firm assess and invest in high growth potential businesses by deploying funds raised from external investors known as Limited Partners (LPs). They hold the committed capital in a fund for a set period of time (typically 10 years) dispersing returns gained from the sale of investee businesses both during and at the conclusion of the fund's lifetime. The sole objective of such a fund is financial return via capital gains, as this is how the VCs themselves are assessed by their investors. CVC, on the other hand, differs in a number of ways. Firstly, CVC activities may comprise either the GP role, or the LP role, or a combination of both. Secondly, while the sole objective of a VC fund is financial return, CVC performance is generally assessed on both strategic and financial metrics. Also VC firms have quite homogenous business models, whereas CVCs have diverse business models, making it a much more exciting space to study.

Corporate Venture Capital in Semiconductor Industry

With the pressure for innovation more intense than ever and conventional R&D yielding stagnant or diminishing returns, growing number of corporations are turning to Corporate Entrepreneurship. Today it has taken root across a broad range of industries, and it looks as if it is here to stay.

In the semiconductor industry corporate venture capital has had its own share of success and failures. A lot of companies got into corporate entrepreneurship/ corporate venture capital in the late 1990's and early 2000's. Semiconductors being a cyclical industry, the investment trends have been very proportional with the business cycles. However, a few industry players have been successful and consistent in investing in this space. Companies like Intel, Samsung, Cisco, and Qualcomm have led the way in corporate entrepreneurship in the semiconductor industry. Let us now take a look at few of the key industry players through case-studies and understand their investment philosophy, structure, process and success. A lot of information in the following case-studies has been collected from in-depth interviews with investment professionals, company literature and other secondary sources.

Case Study 1: Intel Capital

Overview

Intel (NASDAQ: INTC) is a world leader in semiconductor space delivering computing innovation. The company designs and builds the essential technologies that serve as the foundation for the world's computing devices.

Beyond Intel's microprocessor innovations, Intel also invests in innovation through its global investment organization, Intel Capital, one of the largest corporate venture capital organizations in the world. One of the longest standing CVC programs with a track record of more than 20 years and numerous successes to its name, Intel Capital has been patiently working away as a stalwart of the industry. Since 1991, Intel Capital has invested more than US $11B in over 1,339 companies in 54 countries. In that timeframe, 206 portfolio companies have gone public on various exchanges around the world and 344 were acquired or participated in a merger.

Intel Capital - Mission

- Make and manage financially attractive investments in support of Intel's strategic interests
- Execute Intel's strategic acquisitions
- Be the eyes and ears of Intel on technology and business trends

Investment Philosophy – "*Investing in the future*"

Intel's commitment to investing for the future extends to investing in future innovators. The company's substantial investments in R&D, leading-edge manufacturing, complementary

businesses, education, and entrepreneurship demonstrate the company's commitment to transforming the future.

Investment Facts

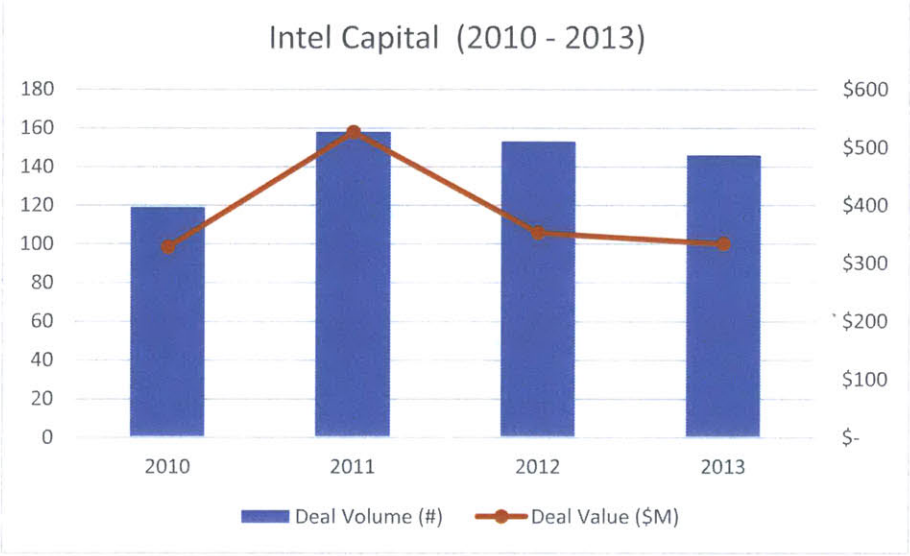

Figure 6; Source: Intel Capital Corporate Presentation; Interviews; Marketline report on Intel

Year	Total Investments	New Investments	Follow-on Investments	Exits
2013	146 Investments $333M	63 Investments $245M	83 Investments $88M	33 Exits 6 IPO, 27 M&A
2012	153 Investments $352M	64 Investments	89 Investments	35 Exits 7 IPO, 28 M&A
2011	158 Investments $526M	NA		NA
2010	119 Investments $327M			29 Exits 12 IPO, 27 M&A
2009	107 Investments $327M	25 Investments	82 Investments	NA

At the peak of the sub-prime/ credit crisis in 2009, Intel had invested $327M in 82 of its existing portfolio companies and 25 new deals. However, the investment did slow down compared to $1.6B in 169 investment rounds, including 65 new deals in 2008.

Notable Investments

Intel Capital has made a number of well-known investments around the globe. These include Action Semiconductor, AVG, Bellrock Media, Broadcom, CNET, Citrix Systems, Elpida Memory, FPT, Gaikai, India Infoline.com, Inktomi, Insyde Software, Integrant Technologies, Kingsoft, LogMeIn, Mall.cz, Marvell, Mellanox, MySQL, NIIT, PCCW, Red Hat, Rediff.com, Research in Motion (Blackberry), Sasken, SiRF, Smart Technologies, Sonda, Sohu.com, Techfaith, VA Linux, VMware and WebMD.

Investment Funds

Intel Capital developed several specialized funds targeting specific geographies or end markets critical for the parent company Intel.

The $100 million **Intel Capital Experiences and Perceptual Computing Fund** (launched June 2013) invests in software and applications making human-like senses – the ability to see, hear and feel – possible on devices to deliver more natural, intuitive and immersive computing experiences across the spectrum of Intel architecture platforms.

The $100 million **Intel Capital Connected Car Fund** (launched February 2012) invests in hardware, software and services companies developing technologies to promote new, compelling in-vehicle applications and enable the seamless connection between vehicles and any connected device, including mobile devices and sensors.

The $300 million **Intel Capital Ultrabook Fund** (launched August 2011) focuses on technologies that drive innovation in companies building hardware and software technologies that help deliver new and enhanced user experiences, longer battery life and slim component and platform technologies.

The $500 million **Intel Capital China Technology Fund II** (launched April 2008) invests in Chinese companies developing innovative hardware, software, and services. It is used to invest in companies that complement Intel's technology initiatives and to further build out Internet infrastructure in China.

The **Intel Capital Brazil Technology Fund** (launched March 2006) is a $50 million fund to promote technology growth in Brazil.

The **Intel Capital India Technology Fund** (launched December 2005) is a $250 million fund that invests in Indian technology companies to help stimulate local technological innovation and the continued growth of India's Information Technology industry.

The **Intel Capital Middle East and Turkey Fund** (launched November 2005) is a $50 million fund for investment in companies developing innovative hardware, software, local content, and services throughout the Middle East and Turkey.

Investment Vehicle Attributes

Intel Capital is 100% owned by Intel, and unlike typical venture capital funds which have limited lifespans, Intel Capital can afford to take a more strategic view on the development timeframes of its investments. Intel Capital focusses on advancing the strategic capabilities of Intel by making investments in businesses which complement its existing products and supply

chain as well as providing insight on future technology directions. To do this, Intel Capital has broad scope in terms of geographies as well as finances.

Intel Capital is one of the top global investors in technology venture capital. It typically invests between $300- 500mn annually into new ventures as well as its existing portfolio. Intel Capital's large scale, its ability to be open-ended and strategically inclined allow it to focus on return on investment in a broad context and over a longer timeframe to maximise return. However determining the best time and method of exit for an investment becomes critical. Exits are typically made through trade sales and occasionally IPO; only a small fraction of the total historic portfolio of Intel Capital ended up being acquired by the parent company.

Types of Investment

Intel Capital typically makes four types of investments:

Ecosystem: Investments made in technologies that support the final products in which Intel's products are used. These companies' products complement and help drive demand for Intel products.

Market Development: Investments made in companies that help accelerate the adoption of technology in emerging markets.

Gap Fillers: Investments made in companies that sell technology that Intel needs to help market or produce its products.

Eyes and Ears: Investments made in emerging technologies that might be useful in three to five years, but are not necessarily related to a current Intel business.

Investment Criteria

First, Intel Capital chooses to focus on entrepreneurs. It is not looking for a completed product or even a prototype. It is focussed on the individuals and the rights skills in team it are looking to invest in. Second, Intel Capital looks for alignment of a potential investment with its 6 focus areas (mobility, software services, consumer internet, digital media and services, computing, manufacturing and labs). Third, Intel Capital looks for the ability to fill a technology niche or solve an existing need. Last, Intel looks technologies which can complement or enable Intel's current technology or show proof of disruptive new technologies.

For example, Intel Capital recently invested in Omek, a company that provides 3-D gesture-recognition and body-tracking technology. This technology is particularly relevant for notebook and Ultrabook platforms, offering new ways to interact immersively with devices without the use of keyboards.

Some investments support broader business and engineering collaboration to extend Intel's capabilities into new territories or segments. For example, last year Intel Capital invested in Borqs, a China-based Android software integrator for mobile phones. The two companies are working together to help deliver Android-based phones powered by Intel chips.

Investment Activities

As one of the technology industry's most experienced CVCs, Intel Capital seeks to be the lead investor in a majority of its deals. However, it targets minority stakes of approximately 20% or less to avoid consolidating on its books to avoid accounting hassles.

Experience also allows Intel Capital to take advantage of a range of opportunities – investing anything from $1mn up to $50mn, and from Series-A investments to later stage investments.

While the Intel Capital's average investment fits the range of private VC firms, when opportunity demands it the firm has invested as high $30M-$50M in the first round. Intel Capital also introduces other investors to companies through its own syndicate program, where the transaction structure or size would benefit from additional co-investors.

Over time, Intel Capital's sector focus has widened from semiconductors as it has taken a broader view of its business ecosystem. Given Intel's focus on chip manufacturing, previous investments have centred on users of such products and allied areas like enterprise software, data centres, digital media and mobile phones. However as the integration of chips has become more ubiquitous, so Intel Capital's investment criteria has expanded to the point that it now includes the full range of what would typically be considered TMT (Technology, Media, Telecommunications).

The nature of many strategic investments made by Intel makes it challenging to measure results – unlike financial returns which are relatively easy to measure. On financial returns, Intel Capital focusses on the bottom line, aiming to achieve the top quartile financial returns when benchmarking itself against other global VC funds. The firm says that this type of focus ensures investor discipline is maintained. Though Intel Capital does not disclose any financial results from its investments, it is very successful and has contributed billions of dollars to Intel in the past.

"The strategic benefits that accrue to Intel are as important and these are more difficult to quantify. We have worked on having a range of measures which had a strategic milestone focus but these became too bureaucratic and did not add that much value. We run a profit and loss approach of accounting – as Intel does off-balance-sheet investment – and we also run a shadow accounting structure to enable us to do a comparison of a fund investment with costs and carry to enable us to indicate an IRR and cash-on-cash return metric which

is comparable to the VC stats. Ultimately we have found that asking our business partners is the best way to measure the strategic benefits. We regularly talk to the heads of the business units at Intel that we work with and they grade us on whether we have helped them, both in devising their strategies as well as with investments and how we can do better."

Source: Global Corporate Venturing, Feb 2013 – Interview with Abdul Guefor, MD Intel Capital Treasury EMEA

Investment Process

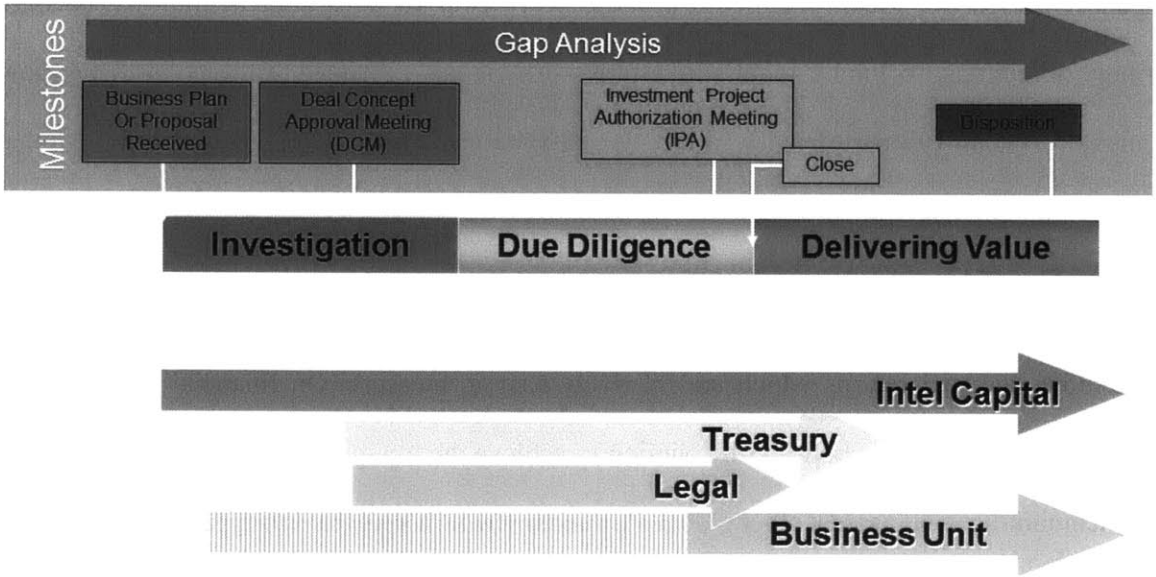

Figure 7; Source: Intel Capital Presentation

Initially in the early years, Intel Capital lost a lot of money. It fixed the problem partly by developing a process, a 17 page flow chart/ process, making sure managers could not go around the process – as happens in big companies – to different managers. It aligned its interests with VCs on price and had similar documentation. And it also started looking at deals other VCs looked at, rather than just look at the deals it wanted.

It also uniquely monitored the internal business, when they were crowding the entrepreneur in a deal, and in doing so protect the small guy from being overwhelmed by a big corporation, be

it Intel or others. Intel's investments have yielded some amazing successes like software maker Citrix, chip maker Broadcom, Chinese Search Engine Baidu etc.

Managing a global franchise ensured a matrix structure of geographic and sector based managing directors and a process for making decisions. Another interesting aspect at Intel Capital is, although the firm has multiple funds focussed on various sectors/ regions, all its money comes from its parent's balance sheet and there is a single investment committee and remuneration policy.

"Intel Capital has survived being so big because it has invested millions of dollars in its web based IT system to share data and performance anywhere, it has a single investment committee with on-the-ground managers and sector expertise, a shared goal and one pot of money."

Source: Global Corporate Venturing, Feb 2013 – Interview with Abdul Guefor, MD Intel Capital Treasury EMEA

People

In order for such a complex operation to be successful a high degree of talent is needed. Of the total global headcount of around 200, there is an investment team of around 80 who are usually sourced from private VC funds. By comparison, some of the world's largest and most successful independent venture capital firms like New Enterprise Associates (NEA), Kleiner Perkins Caufield Byers (KPCB), have spent longer in business, invested less and have smaller technology teams. Compared to Intel Capital's 80 investment professionals, NEA has 32 people in its technology team and KPCB has 30 people in its tech team. (*Source: LinkedIn*)

Staff work within functional constructs similar to a traditional VC – investment staff attend the boards of the businesses in which they invest, get rewarded well when Intel Capital successfully

exits the investment, and it thus ensures the highest calibre of talent are attracted to and are retained by the company.

Interaction with the parent company

Figure 8; Source: Intel Capital Presentation

The key secret to Intel Capital's ascent as one of the most successful semiconductor investors ever, and survive being so big has been its methodical approach and access to Intel's resources and capabilities. Intel can drive a portfolio company's business plan with intellectual property and use its business know-how. Intel Capital is good at evaluating these as its people have financial and operational backgrounds and have a robust relationship with the business units at Intel.

Intel Capital has a steady working relationship with Intel's other business units and leverages a matrix structure to ensure investment opportunities from around the world can be discussed and compared with each other as well as with current R&D programs within the parent corporation. If the opportunities display strong financial potential and are a fit strategically, the investment process moves ahead.

Sometimes there is a tension between the time horizon the fund is looking at and the focus the business unit has on current developments, so Intel Capital aims for around 10% of investments to be eyes and ears for the business, and this includes the Intel laboratories, so it can do investments that may not initially be supported by a business unit.

Intel Capital Differentiated Advantages

Intel Capital has a distinct collection of important value-add benefits that traditional VC firms and other CVC firms are unlikely to match.

Global Reach: With offices in more than 25 countries, Intel Capital has access to a vast network of resources in markets around the world. It has insights into these markets, contacts with local customers and suppliers, and the ability to match portfolio companies with customers across geographies.

Worldwide Customer Access: Through Intel Capital Technology Days and the Intel Capital Global Summit, Intel Capital facilitates regular, targeted meetings with the right decision makers drawn from Intel's relationships with suppliers, partners and customers in every major market in the world. In 2012, Intel Capital facilitated 3,500+ engagements between portfolio companies and customers from Global 2000 companies. Of those 3,500 engagements, 1800+ came through Connect meetings at the Global Summit and 1700+ came through the 76 Intel Capital Technology Days and related activities held in 2012.

Recognized Brand: Intel is among the most recognized brands in the world and connotes quality, integrity, and innovation. This opens doors for Intel Capital and its portfolio companies, in places near and far with customers and co-investors around the globe.

Technology Expertise: Intel Capital's portfolio companies are privy to Intel's architecture roadmaps, gain access to our manufacturing and engineering knowledge, and benefit from the work at Intel's labs and factories.

Summary

Intel Capital presides over one of the longest standing and most successful global CVC programs. Its adaptive approach to CVC has provided an example to many other corporates who have since entered the field of investment. Its ongoing success, and that of its portfolio companies, provides an example of the value corporate entrepreneurship brings via its role as an early stage investor.

Case Study 2: Qualcomm Ventures

Overview

Qualcomm began venture investing in 1998-99, to become more deeply involved in the semiconductor and telecommunications industry and put the idle capital on its balance sheet to work. Given the massive growth in the tech market at that point in time due to the dot com bubble, this informal involvement was swiftly followed by the formation of Qualcomm Ventures in 2000. However, unlike many semiconductor companies who started out investing during the tech bubble, Qualcomm did not cut and run after the dot com crash in early 2000s. Today, Qualcomm Ventures has invested in nearly 100 companies worldwide.

Mission

- Provide an early window on new growth areas in telecommunications and get a first-hand look at emerging technologies and business models
- Support Qualcomm's corporate and individual business units' strategic goals
- Make investments without compromising financial ROI
- Reinforce "Qualcomm" brand name as a forward thinking, innovative and successful company

Investment Facts

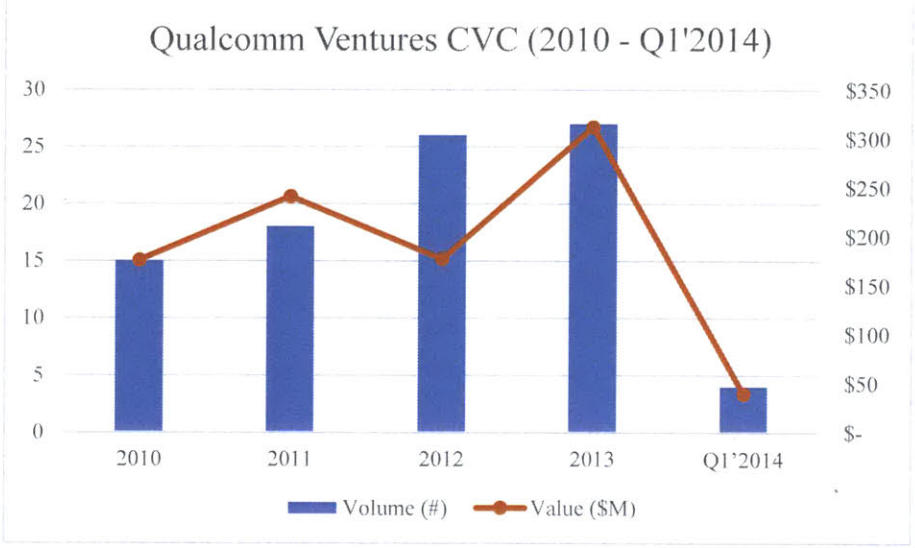

Figure 9; Source: Marketline Financial Database

Notable Investments

Qualcomm Ventures has invested in some very high profile and successful companies. Some of past exited investments include – A123 Systems, Airvana, Inside Secure, Invensense, NetQin, Openwave, Paypal, Validity, Viedle, and Waze. Some of the current high profile investments include 99taxis, appsdaily, avalanche, Bluestacks, Capillary, Cavendish Kinetics, Enovix, Fiksu, Fitbit, MapmyIndia, Open Signal, Plivo, Trigger, Verve, yebhi.com, and Zoop.

History of Success

Qualcomm Ventures has had some major homeruns in its journey of venture investing since 2000. It has had three ">1 billion dollar" exits (Waze, Invensense, NetQin); having started early investments in wireless technology, it evolved today as the #1 investor in mobile technology.

Investment Funds

$500M Qualcomm Ventures Evergreen fund (2000) - funded off balance-sheet to support various investments across the world

$100M (carved off $500M evergreen fund) Wireless healthcare fund (2011) to invest in digital health start-ups to mobilize healthcare with an expected investment size of $2 to $5M for initial investment

Investment Vehicle Attributes

Qualcomm Ventures was created to put the parent company's balance sheet to work and the program today still reflects that – the fund is open ended with investments made entirely off the balance sheet. The fund operates out of four main regions – the US, Europe, China and India – with $500m, €100m, $100m and $100m available for investment respectively.

Qualcomm Ventures was established with three main aims in mind: first, to gain financial returns from smart investments; second, to provide Qualcomm the strategic benefits of building out its supply chain and driving adoption of relevant technologies, therefore it strove to push the adoption of 3G and 4G technology. Qualcomm Ventures achieved both by supporting demand from consumers through services like apps, and supply, via investment in areas such as network and infrastructure.

"We're in the middle layer. We're inside the handset and there are great things around the handset to get you to buy better, faster, handsets because we sell another chip. Those are the three layers we live in. It's all fundamentally to drive more 3G and 4G chip sales."

- *Jason ball, Qualcomm Ventures*

The final aim of the initiative is to act as a sensor, to provide the company with a forward view of technological development in the industry. The direct access of the investment team to the CEO, CFO, CTO, Chairman and other senior executives ensures that they receive information, market and industry insights that would otherwise be forced to filter their way through the rest of the organisation, potentially weakening their impact or corrupting the information.

Types of Investments

The investments made by Qualcomm can be segmented into the following categories:

- Accelerate & influence the growth of the wireless market
- Stimulating demand for wireless technology, new products, apps and services
- Creating new and complementary technologies and businesses
- Enabling new markets (vertical and horizontal)

Investment Criteria

Strategic Fit	**Financial Fit**
Strategic fit of the opportunity - Tier 1: Strong fit with QUALCOMM's products and initiatives - Tier 2: Potential to significantly impact wireless value chain	***Liquidity potential & financial returns comparable to VC investors*** ***Investment Stage*** - Expansion stage (typically 2nd round of financing): ~80% - Early stage (typically 1st round): ~20%

	- Investment size: from $500k to $10M (flexible based on opportunity)
Significant and sustainable competitive advantage - Technology or business model based	***Syndication*** - Strong investor group and board - Co-invest with financial VCs

The evaluation process and investment criteria are pretty similar to those of a private venture investor. After vetting by an investment manager, the investment opportunity needs to get the Qualcomm Ventures group buy in before submitting to the investment committee for final approval. The average ticket size of an initial investment is between $2M to $5M. Most of the times Qualcomm only participates in a syndicated round with other institutional venture investors. And the preference is generally for a company that has demonstrated early customer traction, and for syndication with another institutional investor with complementary skills to the ones Qualcomm brings.

Investment Activities

Qualcomm Ventures plays in almost all stages of a start-up's development cycle, from early stage seed funding through to high-growth venture funding. In order to focus on all stages of funding, it has created three component programs each targeting a different stage of start-up development.

- ***QPrize***, targets seed stage entrepreneurs, provides $100,000 for each of its 6 regions of focus to promising start-ups, with the global QPrize Winner receiving an additional $150,000.
- The second component program is a $5M global allocation pool, with individual start-up investments averaging around $250K-$300K.
- The third venturing program is the largest allocation and provides typical VC like investments; first round investments of $2M-$10M with increasing levels of investment for later stage investment rounds so as to ensure Qualcomm Ventures' stake does not become diluted. Stakes rarely exceed 20%, in order to avoid having to consolidate for accounting purposes. It is estimated that the largest position held in any company was around $70M.

Like other CVCs, Qualcomm Ventures has to balance strategic and financial returns. Some investments may not yield the desired returns, however they are vital in helping the overall business to maintain a technological edge. However, lack of strong financial performance is no excuse, and strong performance in this aspect is very important to Qualcomm Ventures and its portfolio companies.

People

Qualcomm Ventures currently has a team of 31 members. Majority of the people are based of the US (20), while others are scattered in other locations in order have feet on the ground and work with the start-ups in those particular regions. (Brazil: 1; China: 4; Europe: 2; India: 2; Israel: 1; Korea: 1). Within the global team there are Qualcomm insiders, talent from other CVCs, hires from private VC firms, ex-bankers, management consultants and start-up founders. These globally dispersed team members are in regular contact, discussing deals and sharing market intelligence.

Interaction with the parent company

Qualcomm Ventures has had to maintain a tight working relationship with its parent. As explained earlier, the investment team is tightly linked into the high level management of the parent company. Investment teams also have solid links with in-house R&D and relevant business units. This provides a range of benefits, probably the most important of which is the lack of overlap with internal R&D activities. This ensures that opportunities for discovery are maximised and wasted resources are minimised.

Differentiated Advantage

Qualcomm Ventures strives to be a value-added strategic partner and technology enabler to its portfolio companies. It actively assist portfolio companies to gain access to various resources within Qualcomm and its ecosystem, which include:

- Global Distribution Support: Carriers, OEMs and Qualcomm
- Technical Value Add: Sensors, NDK APIs, 3G/4G Trends and Computer Vision (A/R, Text Recognition)
- Early Handset Access: Access to Pre-Release Handsets
- Market Data: Handset Sales Volume (by market, model, manufacturer and OS)
- Qualcomm Life, Inc.: 2net Ecosystem

Through its past investments Qualcomm has learned many lessons that it can pass on to aid start-ups with successful strategies, and sometimes more importantly, to avoid key pitfalls. In addition to the investment professionals who manage the investments, Qualcomm Ventures has dedicated business development and marketing personnel to provide a broad range of support.

Summary

Qualcomm Ventures provides an excellent example of the resilience of strategically minded CVC initiatives – despite starting amidst the uncertainty of the dotcom boom and subsequent Crash, it was able to survive and benefit from the experience. This persistence enabled them to be in a position to continue to invest during the recent recession and benefit from the inevitable recovery.

Case Study 3: Cisco Investments

Overview

Cisco's corporate venture capital effort has evolved over the last twenty years and is a result of the company's innovation strategy which is comprised of three different elements:

- **Build – Cisco's own R&D activities**
- **Buy – Corporate M&A**
- **Partner – The creation of joint ventures and equity investments**

"Partner" is based on Cisco's desire to develop its business ecosystem through the creation of lasting business partnerships, and while Cisco does not have a separate CVC function, this aspect is a great fit with the objectives and activities of CVC. Structure wise, Cisco combines the partnering activities with its M&A function in a group simply known as Corporate Development (Corp Dev) and undertakes direct and indirect investments depending on the circumstances.

This variation on direct versus indirect investment activities grew as a result of the developing role of the corporate development team itself. Initially the team was based out of company's headquarters in San Jose, California, making direct investments in the North American market. However, as Cisco's revenues improved tremendously from several million dollars in revenue to several billion dollars, and the US market becoming mature, it was time for Cisco to expand its geographic scope. Cisco began by making indirect investments in new regions as well as expanded its presence there by establishing offices- The first target for expansion was Europe, then India and China. Alongside its investment activities these offices also aim to build partnerships with other local investors like VCs and institutions such as government.

Mission

- Focus on strategic opportunities aligned with Cisco's businesses
- Keep a keen eye on potential future disruptions that will shape the broader, global market and ecosystem in a meaningful way to Cisco's customers and partners

Investment Facts

Cisco is an active investor with deep market and technology expertise located in major geographies, including US, China, India, Israel, and Europe. Cisco Investments currently has an active portfolio of $2B with over 75 direct investments around the world, and also holds Limited Partner positions in over 35 funds globally.

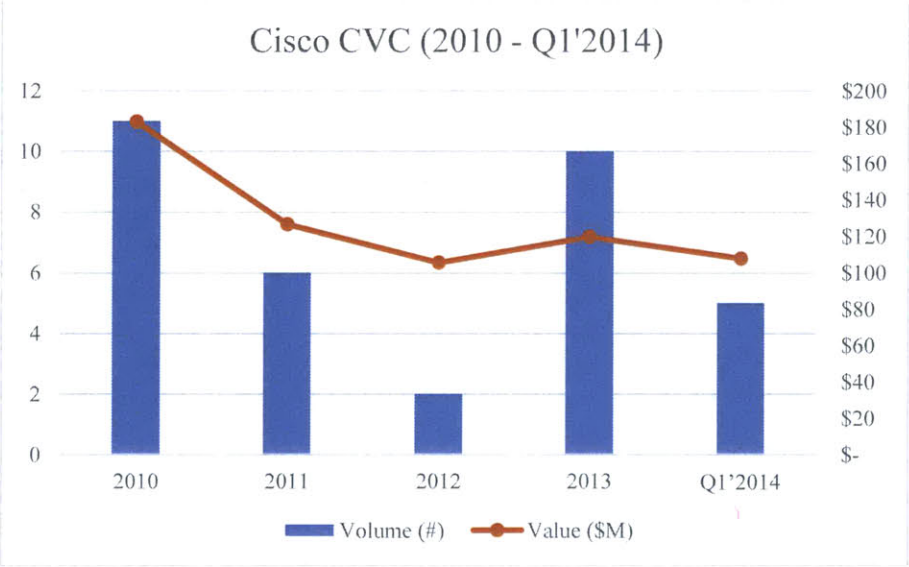

Figure 10; Source: Marketline Financial Database

Notable Investments

Notable investments by Cisco include VMWare, VCE, Aptio, Digivision, Majitek, Secure View, Parallels, Ambiq Micro, Celeno, Aichip, Nimbus, Quantcast, Wilocity among others

Investment Funds

Cisco corporate development makes equity investments through Cisco Investments, a legal entity feeding off money flow from the parent company's balance sheet with allocations to respective business units. There are no separate funds earmarked for distinct markets or regions.

Investment Vehicle Attributes

The equity investments undertaken by the Corp Dev team are highly strategic and aim to build out Cisco's business ecosystem through the creation of new entities, and on vary rare occasions, feeding the company's M&A activities. The decision to make direct or indirect investments is based on geographic capabilities. In regions where Cisco has a presence such as North America, Europe, India and China, it prefers direct investments; in other regions where Cisco does not have a presence, such as Russia and Latin America, it prefers to invest indirectly as an LP into a local specialist fund.

The investment capital comes from Corporate, with business support provided by one of the business units (known internally as the 'Executive Sponsor'). However, the P&L from the investment entity will be associated with the business unit (BU). Typical investments are in the $2M-$5M range are made for equity stakes less than 20% to avoid consolidation in accounting.

Investment Activities

Cisco's CVC activities allow it to track technology in areas adjacent to their own capabilities, as well as those developing in niche areas. When making equity investments, Cisco will typically try to partner with one or more leading financial VCs who will lead the investment, though in a small percentage of deals Cisco will lead terms instead.

As a preference, Cisco will prefer to seek a licensing agreement, so the rationale for an equity investment must be strong. If the decision is made to take an equity stake, a number of circumstances must be met. First, the target business will need to have secured its first major customer or have cleared validation trials as a service provider. Second, the investment sweet-spot will need to be at around $2M-5M for a first round investment. Third, the equity stake taken is likely to be a minority stake of less than 20% of equity.

Cisco also considers broader range of deals, what it terms 'team-based' deals. These are deals where the technology is not as closely aligned to Cisco's current interests or capabilities but in which the company might take an interest in 5-7 years. In such cases Cisco will look for an early stage investment with a financially-focused VC. Cisco also avoids some of the problems of misalignment that come with co-investing with VCs by ensuring it work with VC partners who have plenty of category experience.

Sometimes, Cisco's own strategic investment rationale conflicts with that of a VC who is more focused on financial returns. Here Cisco– as the strategic partner, mitigates the issue by highlighting its ability to provide both strategic advice and a source of business growth. The success of these deals means that Cisco has strong working relationships with VCs and each provides referrals of potential investments.

Investment Process

Cisco provides an excellent example of a company that has, over the years learned how to develop the capability to use the full range of corporate development modes (build, buy, and partner). It has also learned how to blend them into a balanced and very effective portfolio, which it manages very dynamically working to constantly replenish resourcing options, and keep them relevant in its own ever-evolving ambitions, in a constantly changing competitive

landscape. Although Cisco has got the reputation of being the best-in-class acquirer of high-tech companies, it is also serious at complementing acquisitions with partnerships and venture investing. Its balanced approach is rounded out by corporate support activities – in-house venture expertise, use of flexible incentives, an expansive resourcing scanning horizon, and robust execution skills – that keep it supplied with new resources and customer-oriented solutions.

The base strength of Cisco's corporate development is its ability to carefully evaluate sourcing options and engage adaptively and creatively with internal and external stakeholders.

Cisco is structured such that its deal team has a very broad tool kit at its disposal to go after the needs of the market that it is focused on. It considers partnerships, investments, investment-backed alliances, joint ventures, M&A. And it's not unusual if one type of transaction morphs into another type of transaction, either as it engages in initial dialogue with the other firm, or over time. That flexibility, to make sure that the vehicle is the best one to meet Cisco's need and the needs of its customers, is considered an advantage internally.

The determination of the best vehicle for an opportunity is determined in two different dimensions. One is around its relevance to its strategic priorities. How much is it core versus how much is it context? The closer the area is to its core, the more likely it is to bring that into Cisco through a traditional acquisition. For a technology that is nascent, Cisco is more likely to engage in a minority investment. If an area is further from its core or targeted to a specific vertical where it needs to bring technologies or expertise together to meet the needs of a customer, it prefers to do a more traditional alliance.

The other factor is, how well-positioned is Cisco to be able to successfully execute and drive a number one or number two position in that market? If the other company is in a smaller market

that would not benefit from Cisco's ability to drive scale, or if it's in a geography where Cisco is less embedded and wants to learn more and gain market access, it would be a good candidate for a joint venture or maybe an investment. A number of such investments have been made in Korea and China that fit this model.

In terms measuring the success of an investment, Cisco considers two key aspects. One, can it produce solutions that meet the needs of Cisco's customers through this investment? And two, does it generate long-term shareholder value? If it's a company in an emerging market that's very nascent and Cisco wants to see how it evolves, it would measure it on market learning and its ability to react quickly as things evolve. It's truly transaction specific, but Cisco tries to keep it simple and focused on its customers and shareholders while recognizing that all of these transactions have some level of risk.

People

Cisco is an active investor with more than 50 investment professionals with deep market and technology expertise located in major geographies, including US, China, India, Israel, and Europe.

Interaction with the parent company

In order to accelerate and capture the value of the identified disruptions, Cisco Investments works closely with functions of CTSO (Chief Technology and Strategy Officer) organization and the Technology Groups in Cisco Business Entities to partner, invest, acquire and integrate technologies. This includes reinforcing the business cases, and helping to ensure that the best choices are made to tailor to Cisco's business needs.

Cisco Investments is also deeply involved in shaping Cisco's technology strategy: this effort is driven in collaboration with business entities and CTSO strategy teams and aims to develop comprehensive technology strategies, particularly for the ones overarching different areas of the business and amplifying the technology message within CTO/Fellow/Distinguished Engineer communities, Corporate Strategy, Business Entities and Services.

Differentiated Advantages

- Cisco Investments combines the benefits of a corporate investor with that of traditional venture investing. Cisco has the financial strength to use a wide range of investment vehicles to foster innovation in the start-up community. Investment types range from small grants to seed-stage companies and winners of business plan competitions to larger equity investments in later stage and even pre-IPO companies.
- In addition, with Cisco being an influential innovator and buyer of IT technology, a new focus for Cisco Investments is to accelerate the development of the portfolio companies by connecting them to Cisco IT, Cisco's business leaders as well as Cisco's network of partners and customers through its global events and programs, such as Cisco Live and Cisco's partner programs.

Summary

Cisco, not establishing a separate entity to manage equity investments, shows the level to which CVC activities are an integral part of the company. The fascinating aspect of Cisco's investment model is in its deliberate efforts to engage with investment partners like VC either as co-investors or as LPs. Cisco is able to operate effectively as an investor in todays' deals and as an insightful partner for tomorrow's deals by having clear objectives and working with partners who have aligned interests.

Comparative analysis of the three firms

In this section, an attempt has been made to provide a detailed comparison of: Intel Capital, Qualcomm Ventures, and Cisco Investments. At the high level, these firms seem to follow a common approach to corporate venture capital activity, but there exist some clear differences in the way they each set strategic goals and manage their organizations. The analysis will also address the key differences between each model and look at how these companies have positioned themselves for success through a focus on success factors and an ability to overcome the traditional challenges in the industry.

Corporate Objectives

Intel Capital & Qualcomm Ventures*:* Both the firms have pretty similar overall objectives.

- Seek financial returns and ecosystem development;
- "Eyes and Ears" strategy to keep watch of the upcoming trends in the market/ industry.

Cisco Investments*:*

- Seeks financial returns, but is more focused on product development;
- Some of the investments are also made from a relationship building perspective with customer/ market

Fund Sourcing

Intel Capital & Qualcomm Ventures: Direct investment through dedicated funds (from the corporate balance sheet)

Challenge: Balance sheet investing is typically driven and motivated by short-term, quarterly financial results, which is opposite of the traditional VC's longer-term focus. This approach may contribute to difficulties in maintaining commitment to corporate venturing at certain

companies, especially if the venturing arm does not have a long history of balance sheet investment, because companies can pretty easily alter investment levels each year. Potential portfolio companies might not be as attracted to balance sheet investors with a limited history, especially if presented with multiple funding alternatives or other sources of capital with a more proven track record. Intel Capital & Qualcomm Ventures have very strong corporate commitment towards their cause and they also overcome this obstacle by consistently looking to invest in opportunities, even in bad time, in order to keep the initiative's integrity and keep it shielded from the effects of the rest of the corporation and the board.

Key Advantage: Balance sheet investing means, having only one capital pool, which translates to companies needing to spend less time and resources fundraising and managing investors. This allows Intel Capital & Qualcomm Ventures to focus more on finding and mentoring successful ventures.

Cisco Investments: Direct discretionary Investment (allocated to business units)

Cisco Investments is a great example of a company that successfully invests from a fund structure, where it attributed investments to business unit sponsors and they are held responsible for the investments made. This system provides an incentive for Cisco business units to contribute more money if they are actually looking to benefit from Cisco investments and reduces any "free rider" problem that might have emerged. Cisco Ventures still tries to keep the sharing of information open with all Cisco business units to maintain relationships for future fundraising.

Key Advantage: Sourcing funds from an internal sponsor reduces some of the effort of having to find external investors in the fundraising process, and also helps clearly align the investment objective of Cisco with the business objectives of Cisco. In the case of pure balance sheet investment, a challenge exists for companies to avoid falling into a comfort zone with some

expected level of funds ever year. Ultimately, Cisco's approach helps them better overcome one of the key challenges faced by all corporate venturing units: the ability to align incentives.

Investment Type

Intel Capital & Qualcomm Ventures: Intel Capital and Qualcomm Ventures, consider themselves as investors for both strategic and financial returns, and claim that each deal needs to have a healthy financial return prospect as well as strategic rationale. Qualcomm focuses a large majority of its strategic investments on corporate strategic or ecosystem building deals, and investments are not tied to a specific company initiative. Approximately 90 percent of the investments at Qualcomm are developed and decided exclusively within the venture arm since they believe they have a good view of what is needed at the company beyond what the business units are working on. Additionally, even though the corporate venture capital arm does not generally seek direct input from the business units, they do not make investments in any companies that are directly competitive with work being done already by internal R&D.

Qualcomm Ventures: One specific example at Qualcomm that depicts their commitment to long-term relationship development and continued branding in the venturing community exists with the QPrize Program founded a few years back. This program seeks to specifically get closer to early stage companies with less than five years in the market and low revenue levels. Qualcomm attempts to build its relationship with these companies by giving them free software, access to technology, classes, go-to-market assistance, and mentors to help in their development. They solicit applications in a particular region for the competition among start-ups that can lead to great international exposure for the companies that win. This partnership program for Qualcomm might not provide any direct, short-term returns, but does initiate the early development of local ecosystems that could have relevance to Qualcomm in the long-run.

Cisco Investments: Cisco provides a different look than Intel Capital or Qualcomm Ventures as a corporate venture capital unit in many regards. In many ways, Cisco Investments has positioned their corporate venture capital activity in a way that creates the potential to deliver and properly incentivize long-term strategic returns to the parent company because of the close ties with business units. Cisco does not benefit from the same scale and history that exists at Intel Capital, and Cisco might not be at the most ideal spot along the value chain to deliver value to portfolio companies; however, Cisco does still have a strong core business, a growing commitment to corporate venture capital, and an emerging reputation that should position them for long-term success.

Challenge: Cisco is more interested in short-term investments that will lead to opportunities that are two to three years out given that strategic value is more evident early on in an investment. The challenge of longer-term investment (5+ years) is that the strategic priorities change at both Cisco and even more quickly at start-ups. Even if the two are aligned now, their direction might be completely misaligned within five years. Cisco overcomes this obstacle by approximately dedicating 70 to 80 percent of investments which are strategic and looks for product development opportunities guided by input from the business units. The remaining 20 to 30 percent of deals are more purely focused on financial returns. These financial returns deals can be categorized along the line of the "Eyes and Ears" deals, and they seek relevance to Cisco three to five years out.

Key Success factors

Intel Capital & Qualcomm Ventures: These firms seek to add value to start-ups by enhancing credibility to new companies, facilitating new customer introductions, and enabling technical access; Companies can work with a strong core business at Intel/ Qualcomm that is pretty

neutral in the value chain and provides access; Intel also provides strategic, manufacturing, marketing and financial support to start-ups

Cisco Investments: Cisco, on the other hand, is limited to their platform and subject to multiple competitors; Cisco seeks to add value to start-ups through superior access to people and opportunities for partnership with existing Cisco technologies (e.g. joint development agreements around certain technologies) – a combination of Cisco relationships and technical capabilities that can help start-ups; It also views its ability to act as an insider aligned with the successes of a start-up as a large value-add to portfolio companies

Organization Structure

Intel Capital & Qualcomm Ventures: Intel Capital and Qualcomm Ventures, have a very flat organization with centralized decision authority, but do utilize some expertise from other business divisions to support investment opportunity analysis. Each investment committee is made up of the senior executives of the firm, as well as the relevant investment professionals from industry/ region and representatives from the legal and treasury units. The investment approach is relatively quick and efficient with executive-level support and very little intervention from the corporation. This gives them a high level of autonomy – similar to the level one would see in a more traditional VC. While the investment committee is responsible for the final decision of whether or not to invest, the investment professionals are almost solely responsible for the deals that they bring. Once a deal is funded, an investment professional will take on the title of "good guy" or "bad guy" because of his or her ownership of the success or failure of an investment decision.

Cisco: Cisco follows a slightly different organization structure. Business units send sectors of interest to Cisco Investments, which then will look for companies of interest within those sectors. Cisco Investments will then bring companies up to the business units and they will

give input into which companies they like. Business units might also use their personnel that interact with industries of interest to find potential companies that are then forwarded to Cisco Investments. Once potential investment opportunities are identified, those companies that do get investment are typically those where the business units and Cisco Investments come to agreement. The corporate development team, works with the business units and the start-up ecosystem, while evaluating deals. Each deal however is evaluated at the Investment Committee level, which comprises of executive management of the parent company, business unit sponsors, and the corporate development team. The investment goes through only after the investment committee's approval. This approach can slow down decision-making, puts the approval decision into the hands of an executive at least one step removed from the interaction with the start-ups, and can raise timing challenges with start-ups looking for immediate funding and considering multiple options.

Success Metrics

Intel Capital	Qualcomm Ventures	Cisco Investments
• Primary: Investment IRR; • Secondary: Letter Grade from BUs on strategic value, benchmark vs. other VCs	• Primary: Investment IRR; • Secondary: well-defined strategic criteria, benchmark vs. other VCs	• Primary: Balanced financial returns and strategy • Secondary: Qualitative articulation of strategic rationale

In summary, this analysis provides a glimpse of some of the "successful" models of CVC, that are able to clearly achieve the key success factors that drive corporate venture capital and overcome the challenges that most companies face in their venturing efforts. Despite advantages across different metrics for one company over the other, it is difficult to declare one "better" over the other.

Summary of findings from the case studies

The Semiconductor industry has witnessed many companies launching corporate entrepreneurial efforts to foster innovation and deploy the idle money on their balance sheet to work during the industry highs. However, a lot of them winded down this effort. Only a few players have managed to successfully continue corporate entrepreneurship and create value for the parent company as well start-up along with financial returns. Based on the case studies of Intel Capital, Qualcomm ventures, and Cisco, an effort has been made to identify the key aspects of corporate venturing adopted by these players. Although there is no standard "success model" for corporate entrepreneurship, the companies analysed represent those that have successfully overcome the challenges and harnessed the success factors.

Observations on Corporate Entrepreneurship

- ***Objective of Corporate Entrepreneurship activities is not just financial returns***, and there are many strategic objectives targeted by investment in external companies. Financial returns are still important to many companies and in many cases are a required criterion in an investment decision, but other investment drivers also exist.
- ***Initiatives targeting outside the company cannot be considered in a vacuum***, but rather must be evaluated in the context of internal activities. Consistent with the idea behind open innovation, companies combine internal and external ideas in their business models. The business model utilizes both external and internal ideas to create value.
- ***Some corporate entrepreneurship activities are more focused on technology and even product development,*** *while many* of them look toward the development of the ecosystem that exists around their core business and existing products.
- ***There is no standard formula for success***, since semiconductor companies with different objectives and approaches have been successful at corporate entrepreneurship.

Keys to success

- **A clear understanding of the core businesses and strategic intent of the corporation** is crucial in order to design a disciplined and effective corporate entrepreneurship program. This design will dictate investment decision criteria, organization, personnel choice, and approaches to investing in and supporting start-ups. CVC activities, without a well-defined intent and understanding, can not only waste resources, but also distract or prevent companies from achieving their objectives.
- **Strong corporate commitment and support** for medium to long term (5 to 7 years) is necessary for CVC units to produce meaningful results and to gain the confidence of entrepreneurs and the VC community as a reliable source of capital.
- **A mix of talent from within and outside the corporation, including those with experience in VC or other technology companies,** helps companies access a broader network of entrepreneurs while capitalizing on existing relationships and resources within the corporation. This influences not only the volume and quality of deal flow, but also the ways in which the corporate venture may add value to companies in its portfolio.
- **The ability to add value to start-ups beyond financing** is a key differentiator of CVCs from traditional venture capital funds. This can come in various forms, such as access to customers, technical resources, or manufacturing support.
- **A strong, high-quality deal flow** is necessary to achieve the CVC's strategic and financial objectives. This is more important to CVCs than traditional VCs because CVC deals must satisfy not only financial but also strategic objectives. A strong deal flow is the result of various factors including - Understanding of the corporation's core objectives mandates the types of opportunities to pursue; commitment from the top

ensures availability of funds; talent and relationships of personnel allows access to human networks; and the unique ways in which the corporation can add value makes the CVC more attractive to start-ups.

Key challenges to overcome

- **Balancing strategic and financial objectives** is difficult given the challenge of quantifying strategic value and a lack of clear trade-offs between the two. A company can have multiple strategic objectives – technology acquisition, product or ecosystem development, information gathering, partnership building – but CVC initiatives must provide some financial return to justify its existence.
- **Acceptance of failures** is a challenge for many corporate cultures, and CVCs often struggle to achieve the proper balance of risk and return to meet corporate objectives. The ability to let go and not be attached to failed investments differentiates a successful corporate venture firm from a failed one.
- **Maintaining a disciplined long-term investment approach** presents a challenge due to the tendency of start-ups and traditional VC investors to focus on liquidity events. With their additional responsibility to pursue opportunities with strategic value, CVCs must imbibe a disciplined approach to stay focused and not be swayed.
- **Aligning incentives of investment professionals** becomes a challenge for CVCs operating among traditional venture capitalists whose compensation has significant upside, since typical corporate compensation cannot match them. Further, compensation that excessively rewards the upside may be misaligned with the CVC's objectives. But, CVCs need to structure compensation that balances its competitiveness for talented individuals, and its corporate objectives.

Implications for the semiconductor industry

Corporate entrepreneurship and "open innovation" need to be understood in a broader framework. The strategic role of corporate entrepreneurship within the corporate innovation framework needs to be clearly defined and well understood. Companies need to think broadly about their missing pieces in developing a truly innovative business and defining the appropriate role for CVC. Corporate entrepreneurship is not merely about identifying new technologies outside of the firm that can be licensed or acquired for internalized development, but instead should be understood as building relationships with outside parties to enable new, value-enhancing ways of doing business across the value chain and/or the business ecosystem. It appears that most semiconductor companies tend to take the former, narrower perspective in their corporate entrepreneurship activities, whereas the successful semiconductor CVCs take the latter, much boarder perspective. For semiconductor companies whose problem is not necessarily a lack of new technologies coming out of R&D, CVC can be a powerful tool to drive innovation in business models and gaining more influence in the business ecosystem. Treating CVC as supplemental activity for internal R&D efforts is unlikely to be successful.

Measures must be taken to ensure that a company's CVC unit has a good business proposition to start-ups, the VC community, and other industry partners to ensure a robust and high quality deal flow. The company must be able to demonstrate a strong commitment to the CVC initiative, timely decision making, and the ability to provide non-financial value to start-ups. It appears that semiconductor companies typically do not commit sufficient time nor resources to their CVCs, and also slow down their decision making by requiring briefings to and approval from headquarters on every aspect of the deal. A longer-term commitment to the CVC initiative will attract a broader range of companies interested in long-term development

opportunities. Additionally, streamlining this decisions process can allow for increased deal flow at semiconductor/ technology CVCs and the chance to better diversify investments.

While there is no clear recipe for success to balance the financial and strategic objectives of CVC, companies must clearly define the role of CVC within the spectrum of corporate innovation activities and its relationship with existing business units. One of the key challenges for corporate entrepreneurship is finding a balance between financial and strategic returns – a problem that each company needs to solve on its own by understanding and managing the trade-offs between these two objectives based on their own priorities. These trade-offs need to be understood and communicated in the vision and objectives driving the corporate entrepreneurship activity. A heavy focus on either of the extremes of financial or strategic goals can pose some challenges to corporations. On one end of the spectrum, excessive business or strategic focus may limit the types of deals to pursue, and therefore can result in lower financial returns from the CVC investment. This may not only restrict the CVC's access to deals and information in the market, but may also make it difficult to attract and retain high performance investment managers. Conversely, excessive financial focus, while possibly earning very high returns, may alienate the CVC unit from the rest of the company and result in the existence and purpose of the CVC initiative being questioned.

The success of a CVC is determined by the people involved. Careful consideration should be given to balance both internal and external human resources with appropriate compensation and incentives. Any VC or corporate business development unit's access to a high quality "deal flow" is largely based on personal connections and a track record as an investor or deal maker. Furthermore, to attract high quality investment personnel in competition with other VCs and financial institutions, a company seeking to pursue CVC may have to establish a different compensation structure for its CVC staff with larger upsides for successful outcomes. These

may be major challenges for semiconductor companies that typically assign employees to CVC units as part of their career rotation. Senior management of semiconductor companies should be prepared to establish their CVC units with some autonomy in terms of hiring and compensation, but with metrics and measures in place to ensure that the CVC unit is generating valuable results.

Conclusion

The decline of innovation in the semiconductor industry has forced companies to seek out other sources of growth and creativity. As internal R&D teams struggle to find the next game changing innovation, more companies have attempted to tap into the start-up ecosystem for collaboration. In the semiconductor industry, innovation and time to market dictate the success and failure of a product or a company. Corporate Entrepreneurship opens some very interesting opportunities for companies employing it in their strategy. However, it is clear that corporate entrepreneurship is not for every company. While it can be a valuable growth tool, it is effective only when there is strategic fit and executed properly. Considering the benefits that corporate entrepreneurship offers when best practices are applied, it makes sense for companies to adopt this tool into their innovation strategy.

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