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January 26, 2010

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Advanced Valuation Methods

Intellectual Property, Research, New Ventures

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Financing New Ventures

Bootstrapping with Early Access Technology Agreements

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Entrepreneur of the Year Awards

Ernst & Young Strategic Growth Forum

In a program launched by Ernst and Young to break open new networks for women entrepreneurs, Linda Smith, founder of CERES, is invited to participate in this week long forum whose grand finale is the Entrepreneur of the Year Awards.

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Advanced Valuation Methods

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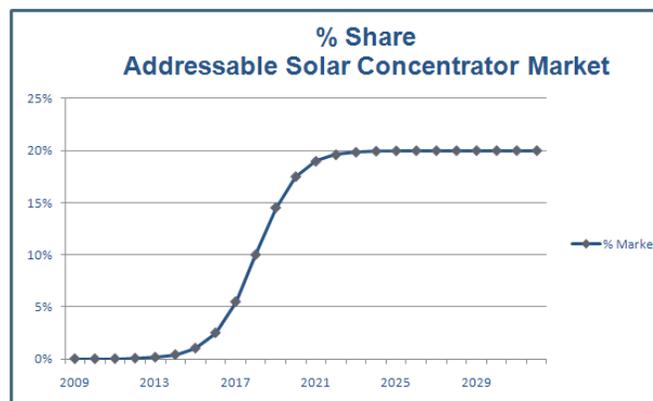
Case: Nanotechnology for Solar Energy Concentration

Consider a fictitious IP portfolio of nanotechnology applied to solar energy concentration. The basis of its value is the potential cash flows from licensing-out. Assume the technology will be exclusively licensed to a chemical company who will commercialize and manufacture a product that will make solar energy concentrators more efficient.

The forecasted royalty rate is 5%, an estimate that considers the 25:75 rule-of-thumb and guideline industry comparable royalty rates.

Addressable market size and average selling price (ASP) are obtained from third party analyst reports, primary research, and weighting competitive product differentiation. Its commercialization potential is reflected by a forecasted market adoption S-curve.

The forecasted end product ASP is \$1 per square foot of addressable solar concentration area.



Proformas include R&D investments, cost and reimbursement of technology transfer, business development and marketing costs, and corporate and patent legal fees. A pure royalty deal structure is assumed with no minimum royalty, kicker, or termination fees. Cash flows also reflect a raw material supply agreement. A quick calculation concludes that executing a raw material supply agreement with the licensor adds significant value with nominal additional risk and upfront investment. The licensor purchases raw material from licensee at a price of 10% ASP. Cost of raw material is 2% ASP.

Traditional Discounted Cash Flow Analysis

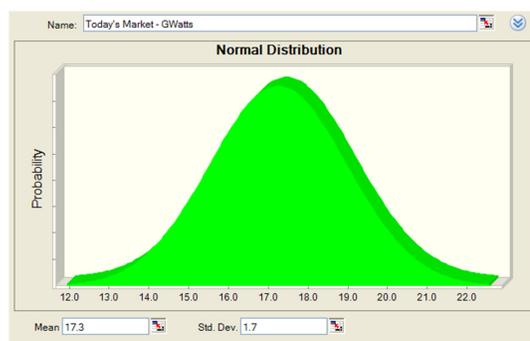
A traditional discounted cash flow (DCF) analysis applies a single discount rate to the proforma licensing-out cash flows. Based on heuristic discount rates used in technology and license negotiations, cash flows that result from licensing-out the technology are discounted at 45%. The risk is assumed “very high”, because it requires development of a new product using a not well understood technology. Risk is not “extremely high”, because solar concentrators exist today, although they are not currently marketed to this segment with these features and benefits.

This traditional DCF analysis yields a single point negative valuation of -\$1.5 million.

Monte Carlo Simulation

Employing a Monte Carlo simulation method, probability distributions are applied to variables in the forecast model to reflect uncertainty in assumptions. In this case, probability distributions are applied to ASP, addressable market, market adoption, royalty rate, and raw material COGS.

The average selling price is assigned a triangle distribution with most likely, minimum, and maximum values of \$0.50, \$0.30 and \$3.00 per square foot.



Today’s addressable market size is assigned a Gaussian distribution with a mean of 17.3GWatts and standard deviation of 1.7GWatts. The average annual forecasted growth rate three years and beyond after launch was assigned a triangular distribution with most likely, minimum, and maximum values of 5%, 0% and 10% to reflect difference in third party analyst long term forecasts.

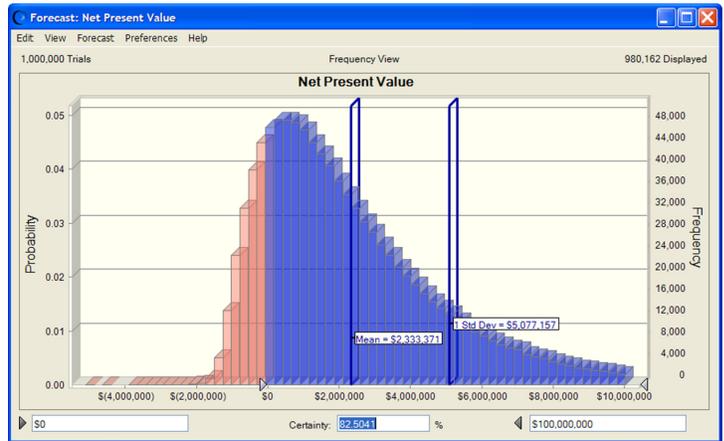
Forecasted peak market share and market share at 2 and 5 years post product launch are two variables that significantly drive the market adoption curve. Peak market share is assigned a triangular distribution with most likely, minimum, and maximum values of 20%, 5% and 40%. Market share post product launch at critical decision points are also assigned triangular distributions.

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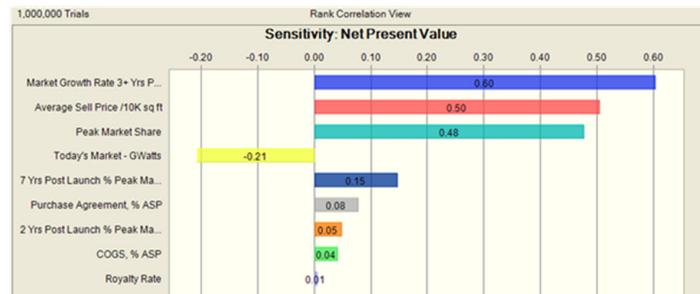
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Applying the same 45% discount rate, reflecting “very high” risk, the Monte Carlo simulation yields a valuation range with a mean of \$2.3 million and within one standard deviation of \$0.5 and \$5 million. The simulation yields a greater than 80% probability that the project would break-even or better.



A sensitivity analysis on the simulation shows that uncertainty around the addressable market dwarfs other contributions to the variance, such as royalty rate, raw material cost of goods sold, and raw material selling price. In addition to a valuation range, the



simulation and subsequent sensitivity analysis yield insight as to what uncertainties drive the valuation and where to focus when mitigating technology or market risk in positioning the technology in license negotiations.

Assessing Risk with Monte Carlo Simulation

Like Real Option Valuation (ROV) methods, Monte Carlo simulation applied to DCF can accommodate options of abandoning or investing more over time. It is also applied to models with variable discount rates that reflect variable risk over time. Applications include pharmaceuticals and other products with high market risk requiring significant R&D investments.

Monte Carlo simulation applied to decision trees facilitates the understanding of overlapping probability profiles of multiple options to assess risk in decision making. An application is the decision to litigate or do nothing when a competitor is successful selling a product believed to infringe on valid patents. The model includes probabilities of validity and infringement as well as royalties and costs of full litigation and settling.

Applications

Advanced mathematical methods are used today to value high risk intangible assets and to assess risk in decision making. Practical applications include impaired asset judgements when acquiring goodwill and a thin balance sheet, licensing transactions, acquisitions of technology companies, patent litigation, valuation of customer relationships and R&D, early stage financings, and technology product planning. Not unlike accepted engineering models, the calculated values are only as predictive as the inputs; regardless, assigning probabilities to reflect input uncertainties yields critical insights.



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Financing New Ventures

Bootstrapping: Harvesting Technology Early

When start-up or growth capital is not available or at a very high cost, bootstrapping is a feasible strategy - even for high technology ventures requiring significant assets, a highly specialized and costly workforce, and years to bring its first products to market. It is often, however, a last resort - considered only after burning through many months shopping business plans to venture capital firms, lenders, or those at established corporations managing the R&D budget. Instead, consider bootstrapping and harvesting your most valuable asset - your technology - for cash, strategic customer relationships, market intelligence, application know-how and more.

Early Access Agreements

“Early Access” or strategic development agreements can immensely benefit an early stage technology company as well as their strategic partner. Deal structures vary, but fundamentally, in exchange for early and sometimes exclusive access to a company’s products or technology for a specific application or market segment, a strategic partner may agree to purchase prototypes and engineering services, execute a license agreement with upfront payments and royalties, and/or agree to invest its marketing resources to fuel broader adoption. In addition to cash, the company gains access to market intelligence and applications know-how - often a vast chasm for early stage technology companies. The strategic partner, on the other hand, earns a competitive advantage with early access to potentially market disrupting technology without the expense of in-house R&D - often an avoided expense for an established company with shareholders’ short term profit expectations.

Collaborative development deals are especially desirable when developing product solutions that require multiple technical disciplines. Fluorescence based medical diagnostics is an area that requires optics, image processing, assay content, surface chemistry, microfluidics, molecular biology, mechanical packaging... as well as clinical labs, human samples, and regulatory resources. It is inconceivable, especially in today’s venture capital market, that an early stage company even with a seasoned management team, NIH grants, and an intellectual property portfolio could raise sufficient capital to pursue a proprietary path on all technology fronts and build the infrastructure to support all aspects of commercializing those technologies. A practical alternative is collaboration and competition via strategic development partnerships.

License-Out

There is often opportunity for early stage companies to harvest elements of their technology whose commercialization is outside the scope of their business plan. Licensing deal structures vary, but fundamentally, in exchange for rights to a company's intellectual property for a specific application or market segment, a licensor would execute an agreement with upfront payments, royalties, purchase of technology transfer services, and/or purchase of the platform components.

Licensing-out is feasible when there is clarity in the business plan as to what market opportunities will be addressed and what elements of the technology will be commercialized. For example, nanotechnologies, such as phosphor nanoparticle and quantum dot, are technologies with many, many market opportunities and product possibilities. The presence of multiple addressable opportunities makes your commercialization strategy a difficult process, however, it may allow for additional revenue streams to license-out what is not strategic to the core business. On the downside, licensing-out constrains long term alternatives. Consider your first-to-market nanoparticle product is slated to serve the solid state lighting market. Do you round out your portfolio and license-out into medical diagnostics now or do you pass retaining the option to commercialize it later? Opportunistically deploying this tactic with uncertainty in the long term strategic direction of the company is obviously risky. Also, the upside value of licensing-out need consider the legal, business development and engineering costs. Sparse early stage business development and engineering resources dedicated to licensing out and transferring technology are at the expense of dedicating them to commercializing the technology.

License-Out as Integral Component of Business Model

"Early Access" and license-out agreements are practical bootstrapping tactics when capital is expensive or unavailable. When strategically integrated into the company's business model, they can cement competitive advantages that thread through your supply chain and distribution channels - capturing value.

Consider commercializing a nanotechnology for clinical medical diagnostics. You co-develop an imaging platform and chemistries that bind the nanoparticle to proteins, cells and tissues via "early access" agreements. You then license-out the technology to suppliers of reagents, biomarkers, and diagnostic assays as well as sell nanoparticles to these suppliers - capturing 5% of their profits in royalties alongside your profits on nanoparticles. With zero capital expenditures, you capture profits in your value chain - imaging hardware and consumable reagents - that without a licensing element in your business model, you would not realize.

CLIENT FOCUS - Zoiray Technologies is successfully bootstrapping a high potential venture that promises prognostics to enable effective personalized therapies for Alzheimer's Disease



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Client Focus

Zoiray Technologies, Inc.

Zoiray Technologies is successfully bootstrapping a high potential venture that promises prognostics to enable effective therapies for Alzheimer's Disease. Without a dime of venture capital or debt, Zoiray is shipping instruments and inking early access deals with researchers to develop content for its label-free multiplexed immunoassay platform.

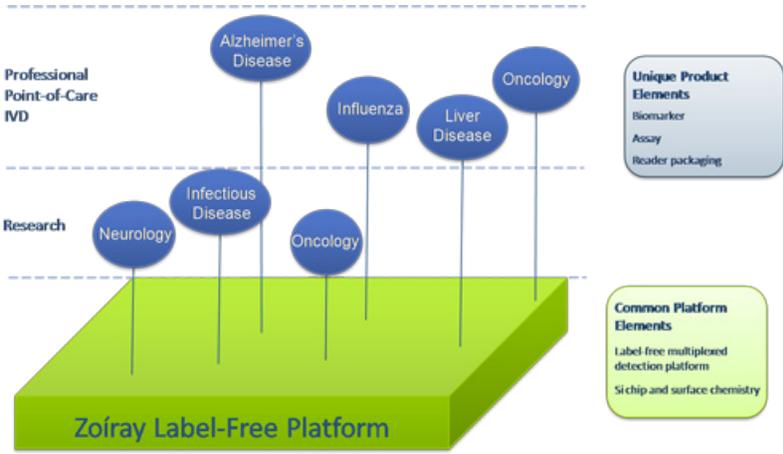
The Competitive Advantage

Zoíray's technology enables many immunoassays to be multiplexed on to one small disposable chip. While multiplexed immunoassays are emerging in life science research, existing techniques require a labeling step that adds significant variability, inhibits high density arrays, and provides a less quantifiable signal. Existing label-free detection technology is too costly and complex for many life science research labs let alone clinical use. With simple, inexpensive, label-free protein array detection, Zoíray expects to make a strong impact in molecular in vitro diagnostics with tests that provide far more information than is currently feasible.

The Market Strategy

Zoiray is targeting segments of the research market now and longer term, will break open and lead the professional point-of-care market with a solution that helps detect Alzheimer's Disease early. The product platform appeals today to research users with an open platform that is far more simple and versatile than existing tools. The breadth of Zoiray's potential assay menu is large and rapidly increasing with the burgeoning discovery of new biomarkers. This broad menu yields sustainable growth with new consumable products - as well as with strategic partnerships developing specific market segments through collaborative development and licensing.

Zoiray is actively engaged in and pursuing strategic partnerships with researchers, healthcare product companies, laboratory and clinical instrumentation companies, reagent suppliers, and pharmaceutical companies. To date, Zoiray has planted seeds in the areas of liver disease, influenza, and Alzheimer’s disease - selling instruments, licensing software, and inking strategic “early access” and licensing agreements.



How did they do it?

In addition to sweat equity and long hours, SBIR NIH grants sparked disease-targeted application development. Leveraging compelling early data, Zoiray successfully sold and shipped prototype instruments to influential thought leading researchers in these disease specific segments. Zoiray focused its limited technical and marketing resources on seeding content development for its platform and on short term revenue. It did not opt to focus on marketing itself to venture capitalists - many of whom, today, are consumed with managing and funding vulnerable portfolio companies and are not making new early stage investments. With each “early access” agreements, Zoiray receives cash, market intelligence, and content development for the platform. And their valuation increases with each deal - enabling Zoiray to part later with less equity in exchange for growth capital in an not-so-early stage investment.

www.zoiray.com