

**APPENDIX 6 – DUE DILIGENCE**

At the heart of the investment decision making process for angels and venture capitalists is due diligence. Absolutely vital to making a sound investment, due diligence verifies any business opportunities that survive the initial screening stage. Due diligence emphasizes understanding and quantifying the risk of the proposed deal, rather than the upside potential. This due diligence process is intended to be tough on investment proposals. For angels and venture capitalists, as few as 10-15 percent of proposals make it past the initial screening stage to the full due diligence process, and only 10 percent of those receive funding. Indeed, the whole point of this process is to discover potential problems and to eliminate unsuitable proposals from further consideration. This is especially important in a start-up situation, where the venture has no track record or tangible asset base and the market opportunity and competitive advantage of a product or service must be verified.<sup>1</sup>

In the most formal of definitions, due diligence is the care that a reasonable person exercises under the circumstances to avoid harm to other persons or their property. In the entrepreneurial venture community, due diligence is the independent investigation of an investment opportunity, and its prospects for success, by a private investor or venture capitalist before funding is provided. It is an intensive and thorough investigation that may take several months to complete and the primary purpose is to understand and minimize the risk to the investor. Due diligence should be started as early in the investment decision making process as feasible. The investor must also make critical decisions between the time to undertake a complete due diligence process and the desire to make the deal under the intense time pressure of the new economy. If the process consumes too much time, the investor may 1) lose the investment opportunity because the entrepreneur may pursue other investors or venture capitalists and/or 2) the critical window of opportunity to get the product to market ahead of the competition may be lost. Thus, time versus thoroughness is a constant conflict throughout the due diligence undertaking. Any methods or systems that can reduce the time to complete due diligence without sacrificing quality will help to increase the efficiency of the external financing process and decrease the time for the commercialization of the innovation.

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<sup>1</sup> See M. Van Osnabrugge and R. Robinson, *Angel Investing: Matching Start-up Funds with Start-up Companies*. THE GUIDE FOR ENTREPRENEURS, INDIVIDUAL INVESTORS, AND VENTURE CAPITALISTS, San Francisco, CA. Jossey-Bass, Inc. Publishers, 2000.

For today's entrepreneurs, inventors and venture investors, intellectual property is often the key asset and centerpiece of the critical due diligence process. Unfortunately, this vital role of intellectual property has not translated into initiatives to increase the efficiency of confirming both ownership and prior claims. It may be said with some conviction that intellectual property issues have been very much the "poor cousins" in the due diligence inquiry. Investigators have been assiduous in establishing the existence and value of tangible assets and other intangibles and in confirming the presence or otherwise of encumbrances, but the enquiry into the extent of the intellectual property of the target organization has been left to the often dubious protection of a vendor or licensor warranty, dubious because of the often illiquid status of the provider of the warranty. In the intellectual property context, due diligence involves the investigation to verify and establish the existence of the intellectual property asset and liability and to determine the extent of encumbrances or restrictions on the rights to use the property. This intellectual property due diligence will be of importance to investors in ventures with intellectual property as the core asset and to promoters of the investments (such as the inventor or entrepreneur). In the first case, there will be a concern to verify assurances made by the inventor. In the second case, there will be the necessity of ensuring that statements made in the offering document (usually a private placement) are accurate.<sup>2</sup>

#### **A. Approaches to Business Valuation**

Suppliers of funding require information on the value of what they are being asked to fund. There are several ways of estimating this value. Three methods are commonly used:<sup>3</sup>

1. Cost: what it would cost today to acquire a similar asset. While this approach is useful in the valuation of tangible assets, it is little used in valuing intangibles.
2. Market comparable: at what price similar assets are currently selling. Again, this approach is useful where there is a developed market, but is little used in valuing intangibles.
3. Projected income: what investors are willing to pay for an asset with a given future income stream. This approach is the most widely used in the valuing of intangibles and especially

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<sup>2</sup> Betts, I., 1997, Legal and Accounting Management Seminars Pty. Ltd., Paper Presented March 24, 1997 at the Due Diligence Seminar: "Intellectual Property Due Diligence".

<sup>3</sup> A.M. King and J.M. Henry, *Valuing Intangible Assets through Appraisals*, STRATEGIC FINANCE, November, 1999, pp. 36-37.

intellectual property.

The third approach is essentially an “economic value approach,” especially if income is defined as net cash flow rather than accounting net income. The difference between cash flow and accounting net income is principally that accounting net income arises after the deduction of depreciation expense. Depreciation expense is not a cash expense, but spreads, or “expires,” the cost of an asset over its expected useful life.

Historically, accounting net income is based upon time-matching revenues with the expenses incurred in earning the revenues, including depreciation. Net cash flow is exactly what it seems, the net of cash movements into and out of a firm. Prior to the reliance of business on costly plant and equipment (tangible fixed assets), the two numbers, net cash flow and accounting net income, were very similar for a given firm in a given year. Production became more and more capital intensive, and more and more cash was spent on plant and equipment that would last for several years. Thus, it became clear that net cash flow was no longer providing a good measure of the operating surplus earned by the firm, and so it was adjusted by the depreciation charge to show accounting net income.

Yet firms grow, survive, or fail based upon their ability to generate cash. No firm has ever succeeded in spending a single cent of accounting net income. Checks cannot be written against accounting net income, but only against cash balances or overdrafts at the bank. In consequence, firms nowadays prepare three related financial statements; a balance sheet, a “snapshot” at a particular time; an income statement, showing the accounting net income over the year to the balance sheet date; and a statement of cash flows, showing cash movements over that same period. Each statement offers a different perspective on the status and condition of the firm. For valuation purposes, however, the net cash flow is the most reliable number, because it is less subject to manipulation than is accounting net income, and has the merit of representing purchasing power in the marketplace. Cash is a matter of fact; accounting net income is a matter of opinion.

### **1. The Time Value of Money**

Money has a time value. The sooner a benefit (cash inflow) is received, the greater its value now. The nearer in time to the present a cash outflow (in broad terms, a cost) is incurred, the larger the impact now. For example, assume that someone is about to be given \$100, and his or her only option, other than spending it now, is to invest it in a money market fund at an annualized yield of 5 per cent, and that this reflects accurately that

person's opportunities, expressed as a "marginal rate of time preference"<sup>4</sup> of 5 percent. The \$100 will accumulate to \$105 after one year, assuming annual compounding. To that person, the "present value" of \$105 a year from now is \$100, assuming a marginal rate of time preference of 5 per cent. That person regards \$105 in a year's time as being exactly equivalent to \$100 now.<sup>5</sup> Another person, faced with the same options, but with a higher marginal time preference rate of 8 per cent, would take the \$100 now, because the 5 per cent interest rate would not be sufficient compensation for waiting a year.

The marginal rate of time preference is commonly described as the "discount rate." The discount rate is the reverse of the compound interest rate. Instead of accumulating a present figure to a future figure, it "discounts" a future figure back to a present figure. Effectively, in the example, 5 per cent is the "rate of exchange" between now and the future. This recognition of the value of time has evolved into what are known as "discounted cash flow" methods of appraising business and investment decision data that are expected to stretch well into the future. None of these ideas is new: compound interest was used in the Old Babylonian Period (*circa* 1800-1600 B.C.) in Mesopotamia, and discounted cash flow techniques were applied to business decision-making in the eighteenth century.<sup>6</sup>

Firms similarly use a discount rate, known also as a "hurdle rate," or a "cost of capital." The two principal sources of finance for a firm are debt and equity, although there are hybrids such as convertible securities, and complications such as options and warrants. Debt is usually taken to be long-term debt such as bonds. Interest on debt is a deductible business expense, and the current cost of a bond may be expressed as its current yield. Bondholders have a contractual relationship with the firm that usually requires payment of interest. Equity holders (usually common stock holders) are the residual owners of the firm. They have no rights to regular payments of dividends. Any dividends paid to them are distributions of capital and are

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<sup>4</sup> A rate of time preference measures an individual's attitude towards current versus future consumption of resources. The modifier "marginal" is usually added because the individual's attitude is likely to differ according to whether it is the first or the last \$100 of income.

<sup>5</sup> This indifference is dependent not upon the existence or otherwise of inflation, but on the use to which the \$100 might be put between now and year from now. Inflation expectations, and other risk factors, will modify the individual's marginal rate of time preference.

<sup>6</sup> For a detailed discussion of time discounting, see R.H. PARKER, *MANAGEMENT ACCOUNTING: AN HISTORICAL PERSPECTIVE*, Macmillan, London, 1969, pp. 34-58.

not tax-deductible. Bondholders, therefore, are perceived to carry a lower default risk, and so require a lower return. Equity holders carry a higher risk of losing their investment, and so expect a higher return to compensate them for the added risk, commonly in the order of 4 to 6 per cent above gross debt interest. In both cases, the expected return is an opportunity cost rate that offers compensation sufficient to encourage the holders to hold rather than sell their investment.

Most firms calculate their cost of capital based upon these expected returns, weighted by the leverage ratio – the debt to equity ratio at market values. A firm with a cost of debt of 6 per cent after tax, and a cost of equity of 14 per cent, and with a 40 per cent leverage ratio, would have what is called a “weighted average cost of capital” of 12 per cent:

Cost of debt (net of tax):	$0.06 * 0.40 =$	0.024
Cost equity:	$0.16 * 0.60 =$	<u>0.084</u>
Weighted Average Cost of Capital:		0.120

The weighted average cost of capital of 12 percent would be the discount rate used by the firm to calculate the present value of a future cash flow stream of firm-average risk.

## 2. The Economic Valuation of Intangibles

Discounted cash calculations may be performed in a variety of ways, but all (including spreadsheets such as Excel) are based on the formulae given below:<sup>7</sup>

Terminal Value (TV) (compounding):	$TV = (1 + r)^n$
Present Value (PV) (discounting of irregular cash flows):	$PV = (1 + r)^{-n}$
Present Value (PV) (discounting of annuities):	$PV = \frac{1 - (1 + r)^{-n}}{r}$
Present Value (PV) (discounting a perpetuity) <sup>8</sup>	$PV = 1/r$

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<sup>7</sup> Most discounting formulae are constructed on the assumption that the first cash flow will occur in a year from now. The formulae may be changed to recognize an immediate first cash flow, and indeed, to assume continuous rather than discrete (annual or periodic) compounding.

<sup>8</sup> In a perpetuity,  $n$  tends towards infinity and so  $(1 + r)^{-n}$  tends towards zero, so that we are, in effect, left with  $1/r$ . Very long annuities may be approximated closely by assuming a perpetuity.

The present or economic value of the benefit from a patent would be valued by discounting its expected future cash flows by the owner-firm's cost of capital. Thus, if it expected to earn net free cash flow of \$10,000 per year over the next 8 years, and if the firm's cost of capital were expected to be 12 per cent over that period, the present value would be \$49,676.<sup>9</sup> The powerful effects of discounting may be demonstrated by the fact that the first annual cash flow, to be received in one year from now, has a present value, at 12 per cent, of \$8,929, whereas the eighth and final cash flow has a present value of less than half that amount, \$4,039. This effect of the discounting process has some benefit, in that the later cash flows, which tend to be much more difficult to estimate, have a geometrically shrinking impact on present value.

### 3. Risk and Value

A cash flow stream of higher or lower than average risk would lead to the weighted average cost of capital being increased by a risk premium or reduced by a risk discount. The term "risk" requires some clarification. Strictly, the terms "risk" and "uncertainty" are not synonyms:

"Uncertainty may be seen as one end of a spectrum, the other end of which is 'certainty.' Certainty may be said to end abruptly, but uncertainty shades into 'risk.' . . . A distinction is often made (only to be disregarded) between risk, where the probabilities of a particular event occurring can be assessed from knowledge and experience, and uncertainty, where the probabilities are not susceptible to such assessment. In practice, a decision problem is likely to contain all three elements, certainty, risk and uncertainty, and so it rarely helpful to distinguish too clearly between the last two."<sup>10</sup>

Risk may be associated with general economic conditions, both domestically and globally, or they may be firm-specific, or "project-specific." A firm's average risk is already built into the firm's weighted average cost of capital.<sup>11</sup> Some projects, however, have as noted earlier, have

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<sup>9</sup> This was calculated using discount tables, which are readily available in most finance texts.

<sup>10</sup> J. FREEAR, *THE MANAGEMENT OF BUSINESS FINANCE*, Pitman, London, 1980, p.67.

<sup>11</sup> Another approach is to use the Capital Asset Pricing Model. This identifies a so-called default risk free rate, being the rate of return on six-month government bonds, and a systematic or market risk based rate being the return on the stock market, which is regarded as an efficient market. As the average investor may remove all firm-specific (alpha) risk by a fairly simple diversification of his stock market portfolio, the only risk for which he requires compensation is the systematic or "beta" risk. This notion, with its linear definition of risk, has led to the development of an industry based on the

risk characteristics that are not average. The simplest way to deal with such projects is to incorporate an additional risk premium into, or, less commonly, to deduct a risk discount from, the weighted average cost of capital.<sup>12</sup> The impact of an added premium to the weighted average cost of capital is to reduce the present value of the cash flows. For example, using the perpetuity formula given earlier:

$$PV = 1/r$$

And assuming  $r$  to be 0.12, the present value of a perpetuity of 1 would be:

$$1/0.12 = 8.33.$$

Adding a risk premium of 4 per cent to 12 per cent to give a discount rate of 16 per cent, the present value of a perpetuity of 1 would be:

$$1/0.16 = 6.25.$$

The present value of the perpetuity is reduced, therefore, by increasing the discount rate to allow for perceived above-average risk.

#### **4. The Economic Nature of Intangible Assets**

“Assets represent expected future economic benefits, rights to which have been acquired by the enterprise as a result of some current or past transaction.”<sup>13</sup> Assets are deferred expenses, that is, they are acquired for

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calculation of “beta coefficients,” which measure the degree of volatility in a stock relative to the market, and enable a judgment to be made as to whether or not the stock is currently valued high, low or about right. A decision to trade might be guided by this judgment. Note, however, that some finance markets may be less efficient, and so the approach just outlined may be less effective in these markets.

<sup>12</sup> The addition of a constant risk premium into the weighted average cost of capital (the discount rate) does not imply that risk is constant over time. Rather, it implies that risk is increasing over time, and at an increasing rate. This is because the same absolute percentage premium is used to reduce the present value of cash flows that are already reduced in present value terms by the basic weighted average cost of capital. Thus the risk premium will have an increasing impact on the present value of later cash flows. Increasing risk may be a reasonable assumption. If, however, it is not, or if the decision-maker wishes to make explicit risk estimates about the expected cash flows in each year, “certainty equivalents” may be used to reduce the value of a risky cash flow to its equivalent cash flow receivable with certainty. The certainty equivalent is rather like a household fire insurance premium. The damage risks associated with a house fire are largely removed by the certain payment of an insurance premium.

<sup>13</sup> R.T. Sprouse and M. Moonitz, *A Tentative Set of Broad Accounting Principles for Business Enterprises*, ACCOUNTING RESEARCH STUDY NO.3, ACCOUNTING PRINCIPLES BOARD, AICPA, New York, NY, 1962, p. 8.

use, and their value is used up over time in the earning of revenue. The “using up” of assets is recognized by means of “depreciation” charges against revenue. Assets such as property, plant and equipment are “tangible” assets and are depreciated over their expected useful life. Patents, trademarks and copyrights are regarded by the accounting profession as “intangible assets,” and are written off—“amortized”—over a period defined in the body of conventions known as “generally accepted accounting principles.” Following a discussion of plant and equipment assets, Sprouse and Moonitz wrote:

“The . . . discussion of plant and equipment is also applicable to patents, copyrights, research and development costs, goodwill, and the like. In one sense, these items represent assets in their “purest” form because their value depends directly on “future economic benefits” and not indirectly on some physical implement or tool that is capable of providing benefits. Their very “purity” as assets (services) makes them difficult to deal with, however, because current or future exchange prices for them often do not exist. The consequence is that these items are notoriously difficult to evaluate and therefore should probably be carried at acquisition cost in the absence of compelling evidence that their value is markedly different. “Intangibles” of limited term should be amortized as production cost or expense over their estimated service lives. Unlimited items should continue to be carried as assets, without amortization.”<sup>14</sup>

APB Opinion No. 17,<sup>15</sup> and FASB Statements No. 2,<sup>16</sup> No. 86,<sup>17</sup> and No. 121,<sup>18</sup> address the accounting treatment of intangible assets, their impairment, and related issues. Generally, intangible assets are recorded in the books of account at cost, including costs of acquisition, and costs needed to make the assets ready for its intended use, such as legal fees. If intangibles are acquired for stock or in exchange for other assets, the cost of

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<sup>14</sup> *Idem*, p. 36.

<sup>15</sup> “Intangible Assets,” Opinions of the Accounting Principles Board No. 17, New York, American Institute of Certified Public Accountants, 1970. See Appendix 1, Page 18 for a summary.

<sup>16</sup> “Accounting for Research and Development Costs,” Statement of Financial Accounting Standards No. 2, Stamford, Conn, Financial Accounting Standards Board, 1974. See Appendix 2, Page 19 for a summary.

<sup>17</sup> “Accounting for the Cost of Computer Software to be Sold, Leased, or Otherwise Marketed,” Statement of Financial Accounting Standards No. 86, Stamford, Conn, Financial Accounting Standards Board, 1985. See Appendix 3, Page 20 for a summary.

<sup>18</sup> “Accounting for the Impairment of Long-Lived Assets and for Long-Lived Assets to Be Disposed Of,” Statement of Financial Accounting Standards No. 121, Stamford, Conn, Financial Accounting Standards Board, 1995. See Appendix 4, Page 21 for a summary.

the intangible is the fair market value of the consideration given, or the fair market value of the intangible received, whichever is more clearly evident. Any costs incurred within the company, however, are expensed as they are incurred, unless they can be directly identified, such as the legal costs of applying for a patent. Internal research and development costs, for example, are generally expensed as incurred, rather than being capitalized and amortized. An intangible asset becomes “impaired” whenever the expected future cash flows (undiscounted and without interest charges) is less than the carrying amount of the asset.<sup>19</sup>

**a) Patents**

A patent may be regarded as an agreement between an inventor and the federal government. Under that agreement, the inventor obtains the exclusive right (for a limited time) to make, use, and sell his invention, in return for making the invention public by giving the government certain information about it.<sup>20</sup> Generally accepted accounting principles perceive a patent to be an exclusive right recognized by law and registered with the U.S. Patent and Trademark Office. The life of the patent is twenty years from the first filing, but the amortization should occur over the estimated useful life of the patent, or the legal life of twenty years, whichever is shorter. “Estimated useful life,” means the period during which benefits are received. If, during that period, legal a company incurs legal fees in successfully defending the patent, then those fees may be added to the asset account and will then be amortized. If patent owners contract to allow another party to use the patent for a stated time period in return for royalties, the patent owner continues to amortize the patent and recognize the royalties earned as revenue.

**b) Trademarks**

The term “trademark” connotes names, symbols, or other distinctive identities given to companies, products, and services, and registered with the U.S. Patent and Trademark Office. There are four kinds of marks: trademarks, service marks, certification marks, and collective marks. Registered trademarks may be renewed indefinitely for successive twenty-year periods. Generally accepted accounting principles require that the cash equivalent amount paid for the trademark be capitalized, along with any

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<sup>19</sup> *Idem.* See the earlier discussion of time discounting.

<sup>20</sup> See J.P. MALLOR, A.J. BARNES, T. BOWERS, M.J. PHILLIPS, AND A.W. LANGVARDT, *BUSINESS LAW AND THE REGULATORY ENVIRONMENT*, New York, Irwin/McGraw-Hill, 1998, pp.144-152.

costs directly incurred in the development, protection, expansion, registration or defense of a trademark. These costs must be amortized over the useful life of the trademark, or forty years, whichever is the shorter.

### c) Copyrights

Copyrights represent a protection given by law to, for example, authors of literary, musical, artistic, or other works. Copyright law protects a copyright for the life of the author plus fifty years. Generally accepted accounting principles require that the cost should be amortized over the period it is expected to produce revenue, but in no case should a copyright be amortized over a period in excess of its remaining legal life, or forty years, whichever is shorter.

## 5. The Accounting Valuation of Intangibles

The above discussion of the accounting treatment of intangibles is essentially transaction-cost based. The accounting valuation of intangibles bears little relationship to the value of their expected future benefits to the firm. As in other areas of financial reporting, the accounting profession tends towards the objective historic transaction cost that is largely irrelevant for valuation purposes, rather than a relevant (value of expected future benefits) but subjective valuation. There are notable exceptions, however, such as oil and gas reporting, and future pension obligations. The accounting profession prefers conservative numbers and it prefers not to estimate or certify value.

Accountants are more comfortable with an objective “hard” number, historical cost, that may be determined by the examination of documents supporting the transaction that gave rise to the cost. Any number of accountants, in assessing the same evidence, will tend, independently, to come up with the same cost number. If an intangible were acquired by an arm’s length transaction, it would appear in the balance sheet at this objectively determined cost, and would then be amortized (see above). If the intangible asset were acquired by means other than an arm’s length transaction, for example, as the product of the firm’s own research and development efforts, it would not be treated as an asset, but would be expensed as incurred.<sup>21</sup> In the firm’s financial statements no attempt is made to measure the value of the future benefits expected to be derived from ownership of the intangible asset.

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<sup>21</sup> Except, for example, and as noted earlier, for legal and other fees in establishing or defending a patent.

In a recent article, A.M. King and J.M. Henry argued strongly that generally accepted accounting principles are out of date in their treatment of intangibles.<sup>22</sup> The article noted that the accounting profession strives, among other objectives, to produce financial statements that are both relevant and reliable. Reliability is achieved by the historic cost approach based on transactions, but at the expense of relevance. King and Henry asked: “How can a company, such as an Internet or high-tech company provide this relevant information if it can’t discuss its intangible assets? For almost any Internet or high-tech company, Property, Plant and Equipment (“PP&E”) is far less important than the idea, the software, the workforce, or the distribution channel. These firms invariably also have little or no inventory. In short, accounting doesn’t capture the essence of these firms. Their real assets – the ones current and prospective shareholders are interested in – aren’t captured by GAAP.”<sup>23</sup>

King and Henry observed that the reliability issues may be resolved through the professional appraisal of intangible assets. Major banks, they stated, are willing now to lend on intangibles, although they may require annual valuations. These valuations would be performed by professional appraisers, who follow the “Uniform Standards of Professional Appraisal Practice.” These standards require the use of one or more of three appraisal bases: cost, market comparable, and projected income. They noted that: “The banks tended to lend the borrowers approximately 30% of the valuation of the intangible assets. By filing appropriate legal documents, the banks were able to obtain a perfected security interest in these intangible assets.”<sup>24</sup>

King and Henry concluded: “If the valuations appraisers perform are reliable enough for banks to lend against, then the values are equally reliable for disclosure in financial statements. Companies should be permitted – perhaps even required – to disclose the values of their major intangible assets . . . This information can appear in footnotes or in the Management Discussion and Analysis (“MD&A”), which are reviewed by auditors.”<sup>25</sup>

A well-respected intermediate accounting textbook delivers a similar message:

“In this emerging economy of knowledge, even some banks have concluded that ‘soft’ assets (like computer programming know-how and information infrastructure) can be a better credit risk than ‘hard’ assets (like

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<sup>22</sup> A.M. King and J.M. Henry, *op. cit.*, pp.33-37.

<sup>23</sup> *Idem*, p. 35. GAAP stands for “generally accepted accounting principles.”

<sup>24</sup> *Idem*, p. 35.

<sup>25</sup> *Idem*, p. 36

buildings). But how should the ‘soft’ assets be valued? Accountants get little solace from former FASB chairman Donald Kirk, who acknowledges, ‘There are arguments that balance sheets ignore certain intangibles, but the reporting issues of trying to recognize them are, in my mind, insurmountable.’ It appears that the assets that really count are the ones accountants can’t count – yet.<sup>26</sup>

A clue as to the latest thinking of the accounting profession is to be found in the Exposure Draft issued by the Financial Accounting Standards Board (“FASB”) in September, 1999. The Exposure Draft is entitled, “Business Combinations and Intangible Assets, and part of its summary deals generally with intangible assets: “The current 40-year maximum amortization period for acquired intangible assets (other than goodwill) would be replaced with a presumption that their useful lives are 20 years or less. However, amortization of intangible assets over lives that are longer than 20 years and nonamortization of assets with indefinite lives would be permitted if certain criteria are met. The Exposure Draft would not change the current requirement to write off the cost of purchased research and development assets at date of acquisition.”<sup>27</sup>

The FASB web site answers a series of “frequently asked questions,” including the following, which deals with the expensing of “in process” research and development costs that have been purchased as part of an acquisition.<sup>28</sup>

*“Q3. Would the Exposure Draft change the accounting for purchased in-process research and development assets (that is, the current practice of writing off the cost of those assets at date of acquisition)?”*

No. The Exposure Draft would *not* change the current practice of writing off the cost of purchased in-process research and development (“IPR&D”) assets at date of acquisition. Following recent research and deliberations on this issue—which included discussions with constituents—the Board concluded that the accounting for purchased IPR&D assets should not be considered separately from the accounting for other

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<sup>26</sup> D.E.KIESO AND J.J. WEYGANDT, *INTERMEDIATE ACCOUNTING*, Wiley, New York, 9th edition, 1998, p.593. The quotation by Donald Kirk is from his article, “Searching for Nonfiction in Financial Statements,” *Fortune*, December 23, 1996, p. 38. It might well be argued, however, that while accountants are capable of validating a professional appraisal of intangibles, they have, so far, chosen not to do so. FASB stands for “Financial Accounting Standards Board.”

<sup>27</sup> September 1999 FASB Exposure Draft, “Business Combinations and Intangible Assets,” Financial Accounting Standards Board Website p. 1.

<sup>28</sup> *Idem*, pp. 3-4.

research and development costs. The FASB may decide to undertake a separate project at some future date that would reconsider the accounting for research and development in its entirety.”<sup>29</sup>

The FASB seems, therefore, to be holding to the expensing of research and development costs. Aside from a change in the normal maximum period over which the amortization of intangible assets may occur, and an increased disclosure requirement, there seems to be no evidence that the FASB is contemplating any radical shift from the existing cost-based valuation approach.<sup>30</sup>

*“Q30. How would the Exposure Draft change the accounting for purchased intangible assets other than goodwill?”*

APB Opinion No. 17, *Intangible Assets*, currently limits the amortization period for intangible assets to a maximum of 40 years. The Exposure Draft would eliminate that 40-year maximum and replace it with a presumption that the useful life of an intangible asset is 20 years or less. However, intangible assets with useful lives longer than 20 years would be amortized over those longer lives if certain other criteria are met.

The Board also believes that some intangible assets have useful economic lives that are indefinite and therefore amortization of those assets is inappropriate. The Exposure Draft would permit nonamortization of intangible assets with indefinite lives if they meet certain criteria. Those intangible assets would be reviewed for impairment annually.

The Exposure Draft also would require disclosure of information about each significant class of intangible assets acquired, such as their fair value at date of acquisition, the method of determining that fair value, and their weighted average useful life. Annual financial statements would include disclosure of the gross carrying amount, accumulated amortization and amortization expense for each class of intangible asset, as well as the amount and description of any intangible asset not being amortized.

### ***B. Initiatives to Develop a Marketplace for Intangibles***

In the valuation of an entrepreneurial venture, investors consider three interrelated components: intellectual property, the management team and the potential market. Clearly, without the intellectual property, as

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<sup>29</sup> The accounting for purchased research and development assets acquired in a business combination is addressed by FASB Interpretation No. 4, “Applicability of FASB Statement No. 2 to Business Combinations Accounted for by the Purchase Method.”

<sup>30</sup> *Op. cit.*, pp.17-18.

exhibited in a patent, there is not a market nor is there a need for a management team to commercialize the intellectual property. Thus, valuation begins with the intellectual property and is interwoven throughout the process.

The valuation of patents, one of the essential ingredients, is central to the valuation of the entrepreneurial venture. In an attempt to place a value on patents and to increase the efficiency of their commercialization, several initiatives to develop a patent marketplace are currently under consideration. Many of these initiatives include fledgling online auction based markets for patents as indicated by the growing number of private online auctions and exchanges for patents popping up around the country—each hoping to use the reach of the Internet to connect universities, corporations and individual inventors with elusive buyers.<sup>31</sup>

Executives at these *online* start-ups say they intend to do for patent rights and other forms of intellectual property what Christie's and Sotheby's do for antiques or what Nasdaq or the New York Stock Exchange do for stocks--develop secure markets where buyers can be confident of what they are purchasing and sellers know they will get a competitive price. These online companies hope that the current rage for e-commerce will carry over to intangible property--creating a booming market in inventions, trademarks and copyrights.

While there are skeptics, several experts in both licensing of patents and online trading believe there's an opportunity for at least a few of these patent exchanges to succeed.<sup>32</sup> Examples of these sites include Patent & License Exchange (PI-x.com), Yet2.com, PatentAuction.com, Virtual Component Exchange and Intellectual Property Technology Exchange (<http://www.techex.com>). Each of these companies has a slightly different approach, but what they all agree on is that large numbers of patents awarded to individuals, companies and research centers—160,000 U.S. patents this year alone—are worthless unless they can find their way to businesses willing to shepherd them to market. The key to these online patent marketplace companies is to make transactions easier and more efficient, whether as auctions or something akin to a computerized dating service that helps buyers and sellers find one another.<sup>33</sup>

As an example of trends to arrive at marketplace valuations of patents, the Patent and License Exchange offers a secure, anonymous, neutral

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<sup>31</sup> P. Jacobs, *Marketplace of ideas selling patents online*, LOS ANGELES TIMES, Monday, October 25, 1999.

<sup>32</sup> Id.

<sup>33</sup> Id.

forum to buy, sell, license or resell the rights to patents around the world. Pl-x.com aims to aggregate buyers and sellers around the globe into a searchable database and to offer tools to process transactions cut down on risk through providing patent validity insurance, escrow services and a suggested pricing system. These services are intended to transform intellectual property into a liquid asset.<sup>34</sup>

In an effort to more accurately place value on intellectual property, the value of the firm in ownership of, or commercializing, the intellectual property often serves as a proxy to the value of the underlying intellectual property. In effect, IP valuation has shifted to venture valuation, also a difficult exercise in today's entrepreneurial economy. In this valuation small companies are preferred over larger ones because, ironically, enterprise value is a more accurate proxy for technology value in small, early-stage companies—particularly those ventures that have not yet launched their main product and have no revenue. Unlike the large mature company, the enterprise value of a small, revenue-less company is not affected by perceived earnings momentum (it has no sales), nor management reputation (its management is typically new and relatively unknown). Free of these impurities, the enterprise value of a small "pure-play" company is left as a relatively pure measurement of the value the market is assigning to the company's technology—its intellectual property.<sup>35</sup> Thus, enterprise value (the value placed on the venture) is a closer proxy to intellectual property value when the existence of externalities to the core business are at a minimum. A larger, mature enterprise derives value from a variety of sources and in such a case it is difficult to "trace" value back to the underlying intellectual property or to disaggregate valuation to the proportion derived directly from intellectual property.

In an attempt to gauge and track the market value of intellectual property the enterprise value has been used. Since a company's market cap is driven by the value of both its tangible and its intangible assets, market cap indices do not and cannot reasonably claim to represent value creation in intangible assets. To do so they would have to have subtracted from them the value of their component companies' tangible assets—their book values. In other words, the indices should be based on market caps minus book values, a metric commonly known as enterprise value. Enterprise value is a fairly common valuation yardstick used in securities analysis to approximate the value of a company's technology.<sup>36</sup>

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<sup>34</sup> S. Kalin, *Patents for Sale*, HOT TOPICS E-COMMERCE, 1999.

<sup>35</sup> A.K. Arrow, An index for our era, pl-x.com website, 1999.

<sup>36</sup> *Id.*

A new index, the Intangible Asset Market (“IAM”) Index has been proposed by The Patent and License Exchange, Inc. The index is intended to fulfill three roles: as a benchmark of raw technology value in various sectors, to provide for quantitative risk measurement of unique IP assets, and to act as a leading indicator for shifts in stock prices of large, technology-rich companies. As noted by the Patent and License Exchange, Inc.: The 150 companies whose enterprise values make up the five IAM Indices qualified to become components according to a highly specific but non-traditional set of criteria. The companies are: technology-rich, non-service businesses heavily dependent on intellectual property; highly focused (“pure-play”) companies in a particular technology niche; minimal revenues and/or earnings; early stage, smaller companies, with minimal infrastructure and globally diverse.

### C. *Security Interests in Intangibles*

As stated previously, the early stage equity transaction includes finding the investor (or the investment), initial screening, evaluating the investment opportunity and conducting due diligence, negotiating the deal and pricing and structuring deals. After conclusion of the transaction, monitoring the investment and harvesting the venture are essential undertakings. The consideration of intellectual property is critical in the due diligence and valuation stage. Increasing the efficiency, in terms of both time and money, in the due diligence phase would assist both entrepreneurs/inventors and investors. Perfecting a lien on a patent is an integral component of due diligence, and any decrease in the time to perfect the lien while result in a streamlining of the transaction process.

In the lightning speed of the new economy, where opportunities and market niche can be lost in a short period of time, any increase in the efficiency of the process will naturally allow innovations to decrease their time to market and contribute to the chance of the survival of the commercial venture. In this process of increasing efficiency and decreasing the time to accomplish technology transfer, opinions vary on both the need and the benefactor of this reduction:

“Some patent experts are lukewarm on the idea of Internet based patent transactions, however. Lita Nelson, director of the Massachusetts Institute of Technology's technology licensing office, says *an auction based Internet* model won't work well for university patents, which deal with very early stage technology. There is no substitute for assessing technology by meeting its developers and evaluating how it could be used, she adds. Others agree. "It takes time and energy to understand the value of a patent," says Kevin DeBre, a partner in the technology group of Brobeck, Phleger &

Harrison LLP in Irvine, CA. On the commercial side, companies are hesitant. "It is a good idea, [but] I don't know if it is a viable idea," says Brad Friedman, senior vice president and patent counsel at Varian Medical Systems Inc., Palo Alto, a maker of medical devices and software for oncology. Such an exchange would appeal more to start-ups that need to make money quickly on their intellectual property than to larger companies, like Varian, which already has technology-transfer mechanisms in place, he notes."

The patent process can best be surmised through an examination of the typically commercialization process for intellectual property. Using the electronics industry as an example:

"The problem is particularly acute in the electronics industry. About a quarter of the 600,000 patents available for trade each year worldwide concern electronics. And, patents in the electronics field become obsolete faster than those in any other area. Particularly in the fast-paced computer, consumer, and communications segments of the electronics market, the technology landscape can change in anywhere from six to 18 months.

The existing, inefficient way of trading in patents requires several steps. If you want to sell a patent, you'll often spend a year trying to find somebody who wants to buy it. Similarly, buyers who are looking for a new design or technology patent will spend a year trying to find the right one.

Next, you have to decide what the patent is worth. That takes six months if you're lucky, and two or three years if you're not. The problem is that a patent is essentially a right to use a technology. But what's the value of that right? If you're selling patented core circuitry that can be turned into the best communications chip around, you'll set a pretty high price. But a potential buyer must assume a number of risks: risk of the patent's validity, development risks, fabrication risks, and even the risk that someone will infringe on the patent. The buyer naturally wants all of this factored into the equation. Thus, the patent's price becomes the all-important indicator of the potential reward versus all that risk. And once the parties settle on a price, they could take another six months to close the deal."<sup>37</sup>

The table below summarizes some of the time and cost points for the commercialization of a patent.

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<sup>37</sup> J. Child, *Technology Breakthrough*, ELECTRONIC DESIGN, pl-x.com website, 1999.

<b>Process</b>	<b>Time</b>	<b>Cost</b>
Need for financing or buyer	Up to 1 year	Equity share negotiated
Negotiating the Deal and - establishing patent value	6 months to 3 years	Up to _ the patent value
Searching lien Databases	varies	Up to \$500 per state

To assist in assigning values to patents in the absence of an auction market to establish values, an adoption of the Black-Scholes option pricing model has been proposed. In the context of options, real options theory is combined with data from publicly traded technology-rich companies to compute reasonable market values for patents. In the context of the Black-Scholes option pricing model: A patent, like a call option, is a right to an asset which may or may not have future value. Patents are typically offered for sale or license in units of related patents covering a single product line, and they are valued based on their financial risk and reward... Patents, and unit combinations thereof, are real options. The Black Scholes option pricing formula, with the precise, transparent, reproducible price it calculates for traded equity options led to the robust, liquid options marketplace we enjoy today...the suggested patent values give the buyer and seller a starting point for auctions or negotiations. Because some of its inputs are the market prices of publicly traded stocks, the price changes daily.

#### ***D. Insurance for Patent Validity***

Historically, market gaps or discontinuities represent an opportunity niche for business. In the case of patent transactions, the need for a recording system for security interests in intellectual property represents such a discontinuity that has fostered the emergence of patent validity insurance. The insurance, intended to achieve some reduction of the risk associated with the acquisition of a patent, adds to the transaction cost and the cost of commercialization technology. This additional transaction cost in turn adds to the cost of the early stage equity investment, in terms of both the amount of external capital required and the increase in the equity share that an entrepreneur must relinquish. The cost of patent validity insurance can serve as a proxy to the benefit of a recording system for security interests in intellectual property which would in part eliminate the need for certain provisions in the insurance. The leader in the field, Swiss Re New Markets, a division of the Swiss Reinsurance Company, has developed a new patent

validity insurance available with the purchase of patents and licenses. As with title insurance for homebuyers, the insurance provides protection against liens and ownership other than the seller. In terms of the scale of the market for the Swiss Reinsurance Company product:

For most companies, intellectual property (“IP”) today is the most important corporate asset. But this most important asset and the associated risks are almost completely uninsured. The corporate IP insurance market is an emerging, new market with large potential benefit to companies whose strength lies in innovation.

IP has increased dramatically in importance for corporations over the last 20 years. In 1982, the hard assets of industrial companies were said to account for 62% of the companies market value. By 1992, tangibles made up 38% - and intangibles 62% - of their value. In 2000, intangible assets and IP values are clearly the most important asset of most industrial companies. Driving factors behind this increase are:

- A increased intensity of competition,
- A increased rapidity of technological growth and innovation,
- A increased reliance on legal protection of rights in IP and increased enforcement of IP rights,
- A increasingly sharp liability standards for infringement and misappropriation.

The annual number of patent infringement losses exceeding US \$10 million doubled since 1993, and losses of US \$100 million and more are no longer uncommon today. Exposed companies include those in the electronics, pharmaceuticals, machinery, computer, bio-technology, medical devices and equipment, automotive, chemicals, textiles, telecommunications, toys, sporting goods, and building materials industries.<sup>38</sup>

The concept behind the patent validity insurance is to protect the buyer and to provide the seller with a more accessible market since the insurance affords a degree of downside risk protection for the investor. A patent validity coverage indemnifies the patent buyer or licensee for amounts lost due to a later invalidation of the patent. Each ... buyer or licensee is protected against the risk of financial loss that can arise when the purchased

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<sup>38</sup> See Swiss, Re, *The significance of intellectual property assets, risks and insurance*, SWISS RE WEBSITE, 2000.

patent is declared invalid. Invalidity could be declared, for example, if the inventor or patent applicant failed to disclose information in the patent application process or because of outright fraud, such as a fictitious patent or a patent offered for sale by someone other than its owner. Coverage can be provided for the buyers purchase price or license fees, plus tooling costs and even for investment in developing the new product from the patent rights acquired.

The insurance may also enhance market liquidity since the investor or licensee can be insured for the amount of the up-front purchase price paid for the license or patent. According to William Hoffman, associate director of Integrated Risk Solutions: "Patent validity insurance is a win-win product. It promotes the growth of a new market by reducing risk. Sellers as well as buyers benefit from this coverage. Businesses with marketable intellectual property seeking to deploy their valuable but non-performing intangible assets benefit from the increased number of buyers who are willing, ready, and able."

Specific insurance coverage for the buyer or seller varies. Some features of the insurance protection include:

- A indemnity for damages for which the insured is liable to third parties,
- A legal costs incurred in defending a patent infringement claim,
- A legal costs incurred in defending an injunction claim,
- A legal costs in bringing an action for a declaration of non-infringement,
- A discretionary coverage for a single lump-sum paid-up license royalty, and
- A flexibility for providing specialty coverage for other client-specific IP risks.<sup>39</sup>

The valuation of intellectual property is central to the valuation of the entrepreneurial venture.

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<sup>39</sup> See SWISS RE WEBSITE, 2000.