Research Papers:

The Goldman Sachs Warrants
Linus Wilson —
B. I. Moody III College of Business,
University of Louisiana at Lafayette

The Valuation of Tax Shields Induced by Asset
Step-Ups in Corporate Acquisitions
Alexander P. Groh —
International Center of Financial Research (CIIF),
IESE Business School, University of Navarra,
Barcelona, Spain
Christoph Henseleit —
Bain & Company, Munich, Germany

Country Risk Ratings and Financial Crises
1995 – 2001: A Survival Analysis
Mónica Roa —
National Planning Department, Colombia
Andrés Felipe Garcia —
Universidad del Rosario, Colombia
Leonardo Bonilla —
CEER-Colombian Central Bank, Banco de la República

Fashion Accessory Buying Intentions Among
Female Millennials
Lawrence M. Bellman —
Zarb School of Business, Hofstra University
Ira Teich —
Lander College for Men, Touro College
Sylvia D. Clark —
The Peter J. Tobin College of Business,
St. John’s University

An Integrated Framework for Information
Security Management
Qingxiong Ma —
Harmon College of Business Administration,
University of Central Missouri
Mark B. Schmidt —
G.R. Herberger College of Business,
St. Cloud State University
J. Michael Pearson —
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Teaching Points:

Modern Bankruptcies as Tools for Teaching
Valuable Lessons in Business
Anthony Michael Sabino —
The Peter J. Tobin College of Business,
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New at The Peter J. Tobin College
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About the Review of Business and Author Submission and Review Guidelines ....................... 79
Welcome to our 41st year of publication! We are expanding our policy to bring you an analysis of topics from the global perspective. This issue contains an article written by authors from Spain and Germany and another from Colombia, South America. Our recently-introduced section called Teaching Points is becoming established as interest in it continues to grow.

To work on solutions to our present financial crisis, Linus Wilson in The Goldman Sachs Warrants seeks an improvement in our challenged financial system. He has proposed a model to value the Capital Purchase Program (CPP), using a methodology which contributes to more transparency and uses widely recognizable tools. This methodology has a valuable practical application: it can be used by non-profit firms as well as by the more than 280 publicly traded banks that have received CPP funds.

Alexander Groh and Christoph Henseleit, from Barcelona and Munich, wrote The Valuation of Tax Shields Induced by Asset Step-ups in Corporate Acquisitions. They discuss the relevant parameters and introduce an approach with respect to tax shields. As the current research in corporate finance does not provide a consistent approach towards the valuation of step-up induced depreciation and amortization, the authors focus on this issue with respect to mergers and acquisitions.

Reporting on global issues and reminding us of another recent international crisis, authors Monica Roa, Andrés Felipe Garcia and Leonardo Bonilla, from Colombia, present Country Risk Rating and Financial Crisis 1995 – 2001: A Survival Analysis and offer evidence of the importance of debt instruments, with a methodology to test the persistence of credit risk agencies. They argue that because of the space-temporal characteristic of survival models, it is feasible to combine idiosyncratic country effects and time effects, which in turn are tied to financial contagion.

Returning to our home front, Lawrence M. Bellman, Ira Teich and Sylvia D. Clark have done a study concerning consumer behavior. They examine the potential effects of external variables, such as age and frequency of mall visits on a consumer’s attitude toward intended purchasing behavior. Fashion Accessory Buying Intentions Among Female Millennials focuses on this specific group and it points to some unexpected findings that are very useful to those wanting to attract these consumers as their clients.

In An Integrated Framework for Information Security Management, Qingxiong Ma, Mark B. Schmidt and J. Michael Pearson remind us that the development of information security is also an important IT development area. The maturing of security processes should be measured and adjusted to meet the needs of an organization. They propose a method that compares an existing security need to a maturity scale adopted from a capability maturity model.

In our special section called Teaching Points, (which is also peer reviewed), Anthony Micheal Sabino shows us that modern bankruptcy scenarios provide a teaching opportunity across a
From the Editor

broad range of business disciplines. His paper, *Modern Bankruptcy as Tools for Teaching Valuable Lessons in Business*, provides educators with the ability to explain and examine interactions and interconnectivity among varied business subjects.

Finally, *New at The Peter J. Tobin College of Business* describes two forthcoming graduate programs that will begin in the fall of 2010 at our St. John’s University campus in Manhattan.

Igor M. Tomic, Ph.D.
Editor, Review of Business
Executive Summary

Warren Buffet’s investment in Goldman Sachs in many respects foreshadowed the Capital Purchase Program’s preferred stock plus warrant investments announced a few weeks later by former Goldman Sachs CEO Henry Paulson. This paper assesses the Capital Purchase Program (CPP) and Berkshire Hathaway warrants issued by Goldman Sachs in 2008. It estimates that on May 1, 2009, the taxpayers’ warrants in Goldman Sachs were worth between $250 million and $1.2 billion. In addition, Berkshire Hathaway’s warrants issued by Goldman Sachs were worth between $1.33 and $3.45 billion. The paper’s methodology could be of interest to policy makers, non-profits, journalists and advisors for the government and the more than 280 publicly traded banks with CPP warrants outstanding.

1. Introduction

As part of the Emergency Economic Stabilization Act (EESA) that was signed into law by President George W. Bush on October 3, 2008, the U.S. Treasury was mandated to buy warrants in any company receiving EESA monies. Congressman Barney Frank, the Chairman of the House Financial Services Committee, was one of the most vocal architects of the EESA legislation. In a letter to his constituents, Congressman Frank explained, “The bill [the EESA] also protects taxpayers by requiring participating companies to provide warrants to the government so that taxpayers will benefit from any future growth of these companies.”

Phillip Swagel was the Assistant Secretary for Economic Policy from December 2006 to the end of the Bush administration on January 20, 2009. He offers another perspective on the deliberations between Congressional leaders and the U.S. Treasury. Swagel (2009) argues that the U.S. Treasury, led by former Goldman Sachs CEO Henry Paulson, Jr., was forced by Congressional negotiators to accept the provisions requiring the government to obtain warrants in the companies selling assets in exchange for TARP funds.

Many Congressmen may have been swayed by the example of famed investor Warren Buffet’s company Berkshire Hathaway, which bought preferred stock and warrants in Goldman Sachs (GS) in exchange for $5 billion of cash. Thus, in this sense, Goldman Sachs may have inadvertently had a great impact over the structure of the TARP and the Capital Purchase Program, which took on a very similar structure to the Berkshire Hathaway investment. The Capital Purchase Program was announced on October 13, 2008, by Secretary of the U.S. Treasury Henry J. Paulson, Jr. The Capital Purchase Program (CPP) was initially slated to hand out $250 billion to healthy institutions in exchange for preferred stock and warrants. Nevertheless, according to SIGTARP (2009, pp. 43, 45), only $198.8 billion had been invested by March 31, 2009. Over 532 qualified financial institutions have participated in the capital purchase program. Yet, the majority of the monies handed out thus far, $110 billion, have...
The Goldman Sachs Warrants

gone to the six largest bank holding companies — Bank of America, Citibank, Goldman Sachs, JP Morgan Chase, Morgan Stanley and Wells Fargo. This roughly reflects their assets as a percent of total assets of depository institutions and brokerage institutions.

Lucas van Praag, global head of Corporate Communications at Goldman Sachs, said, “We think that taxpayers should expect a decent return on their investment and look forward to being able to provide just that when we are permitted to return the TARP money.” Here the author tries to estimate what a fair return might be. Mr. van Praag in that article says that Goldman Sachs does not support the position that the American Bankers Association has taken — that the warrants should be expunged. On July 22, 2009, after this analysis was conducted, Goldman Sachs bought back its TARP warrants for $1.1 billion. That was the highest price for a warrant repurchase up to that point.

The Goldman Sachs’ CPP warrants were valued at between $436 million to $558 million in the report of the Congressional Oversight Panel (2009, p. XIV-1). That study valued the warrants on October 13, 2008, when the CPP was announced. In contrast, the present study values Goldman Sachs’ warrants on May 1, 2009. This date was chosen because it was just prior to the release of stress tests of the 19 largest financial institutions. Only after the stress tests were released could Goldman Sachs or any of the other seventeen institutions receiving capital from the government pay back their TARP monies. Moreover, the American Bankers Association was lobbying Congress in April 2009 to expunge all warrants because its representatives were arguing in part that the warrants had little value.

There is a more important difference between the present study and the report of the Congressional Oversight Panel (2009, p. XIV – 1). That study used Monte Carlo simulations to value the warrants. Monte Carlo methods use randomly drawn parameter values to repeatedly derive the value of the securities over hundreds and thousands of simulations. While Monte Carlo methods can provide more accurate results, they also can lack transparency. Such simulations are sensitive to the assumptions used in the simulation. If care is not taken by the study to explain the assumptions so that the study’s readers will understand them, then it is hard to interpret the results. Binomial “lattice” models such as the model of Cox, Ross and Rubenstein (1979) are more flexible than models based on Black and Scholes (1973) and Merton (1973). Binomial or lattice models look at the movement of asset prices in small discrete up-and-down movements. Binomial models can account for time varying volatility, early warrant exercise, special dividends and other complications. Unfortunately, all those features make the valuation more subject to the appraiser’s assumptions and harder for even experienced practitioners to evaluate quickly. In contrast, this study proposes a methodology based on Black and Scholes (1973) and Merton’s (1973) popular models that can be easily replicated.

...If the value of Goldman Sachs’ warrants are representative of the value of all the warrants issued in the Capital Purchase Program (CPP), then expunging the CPP warrants would amount to a $5 – $24 billion dollar additional subsidy to the banking industry, at taxpayers’ expense.

For example, the Web site www.subsidyscope.com, which was launched by the Pew Charitable Trust, lists all the strike and current stock prices of the CPP warrants; but at the time of writing, it has not attempted to value them. With Black and Scholes (1973) and Merton (1973)’s models,
as opposed to Monte Carlo methods used by the Duff & Phelps valuation in the Congressional Oversight Panel (2009)’s report, rough estimates of the value of the warrants could be generated on a mass scale, in real time, as long as they make some assumptions. Any assumptions about volatility and dividend yield could and should be clearly stated. The Black and Scholes and Merton models contain relatively few inputs. Thus, it is easy to focus on which inputs are driving the results.\(^7\)

John Olagues’ blog focused on values the CPP and Berkshire Hathaway warrants on September 23, 2008 and the Capital Purchase Program warrants on October 28, 2008.\(^8\) Olagues did a good job of explaining his assumptions about volatility, for example, but there are limits to how much of the models and methodology can be explained in a blog post of about 700 words. This paper, in contrast, assesses the values of the CPP and Berkshire Hathaway warrants on May 1, 2009. In addition, the present paper attempts to be clear about methods, calculations, models and assumptions, so that the results can be replicated for any of the other warrants purchased through the Capital Purchase Program.

*When the stock market rises, the probability that Goldman Sachs will complete a qualified equity offering will rise.*

This valuation is conducted assuming that the American Bankers Associations’ (ABA) attempts to expunge the CPP warrants will fail with certainty. The author does this because he wants to see how much money taxpayers would be leaving on the table if the ABA is successful. Goldman Sachs received about one-twentieth of the CPP funds passed out according to SIGTARP (2009, p. 45). Thus, if the value of Goldman Sachs’ warrants is representative of the value of all the warrants issued in the Capital Purchase Program (CPP), then expunging the CPP warrants would amount to a $5 – $24 billion dollar additional subsidy to the banking industry, at taxpayers’ expense.

In section 2, the assumptions, the option pricing models and the methods used to calculate the inputs are outlined. In section 3, the results are discussed. In section 4, the paper concludes.

2. Valuation Methods

2.1 Reduction Provisions

The CPP recipients can cancel half the TARP warrants by completing qualified, preferred or common stock offerings which are in aggregate equal to or in excess to the par of the CPP preferred stock investment. The CPP term sheet reduces the number of warrants outstanding by half if a qualified equity offering is completed by December 31, 2009. If the U.S. Treasury sells a bank’s warrants to third-party investors, it is prohibited from selling the half that could be cancelled by a qualified equity issuance prior to January 1, 2010. Thus, third party buyers need not worry about their warrants’ being cancelled. Only taxpayers should be concerned about the cancellation possibility because it affects the value of the warrants they hold.

In Goldman Sachs’ case, presumably the qualified equity offerings are only those that have taken place after the CPP was announced on October 13, 2008. Yet, without clear precedent and a statement from the U.S. Treasury, this is a somewhat murky issue. In an e-mail to the author, Goldman Sachs’ spokesman Lucas van Praag said that Goldman Sachs is short $4.75 billion dollars in having completed a qualified equity issue as of May 1, 2009. It received $10 billion as part of the capital purchase program on October 28, 2008. Goldman Sachs issued $5.75 billion in common stock at $123 per share in April 2009. Yet, it also issued $5.75 billion dollars in common stock in
September 2008 at $123 per share and received $5 billion dollars from Berkshire Hathaway in exchange for preferred stock and warrants on October 1, 2008. If either of those September and October 2008 issues were counted towards the U.S. Treasury’s qualified equity issue number, the total number of warrants would be halved from 12.2 million to 6.1 million immediately.

A higher probability that half the CPP warrants will be cancelled reduces the expected value of the taxpayers’ warrants. The author places a subjective probability of 50 percent that half the warrants will be cancelled in his middle estimate. In the author’s low-end estimate, there is a 90 percent probability of the warrants’ being cancelled. In the high-end estimate of the CPP warrants’ value, there is a 10 percent chance that a qualified equity issuance will be completed by December 31, 2009.

Sales of public equity seem to be highly correlated with strong equity markets, according to Baker and Wurgler (2002) and Huang and Ritter (2009). For this reason, it probably is not appropriate to assume that the completion of a qualified equity issuance is an idiosyncratic risk. In the Capital Asset Pricing Model of Sharpe (1964) and Lintner (1965), well diversified investors will demand extra compensation for bearing systematic risk, but they will behave as if they were risk neutral with respect to idiosyncratic risk. (A risk neutral investor only cares about his or her expected payoffs but is indifferent to the distribution of those payoffs. For example, a risk neutral investor would be indifferent to holding an asset that pays $1 with 100 percent probability or an asset that pays $0 with a 50 percent probability and $2 with a 50 percent probability. Both assets have an expected payoff of $1. That is $1*1 = $1 and $0*.5+$2*.5 = $1.) In the CAPM, assets that are negatively correlated with the market actually require returns less than the risk-free rate. Thus, assets such as gold that are often seen as worst case scenario investments tend to have very low returns over the long run. Thus, the expected number CPP warrants outstanding at the beginning of 2010 is probably negatively correlated with the returns on the S&P 500 stock index.

...Obligations from selling warrants are fulfilled by the issuing firm... The company issues more shares to fulfill its warrant obligations. This will lead to a dilution of existing shareholders’ percent ownership in the firm.

Because the number of warrants outstanding by the end of 2009 is negatively correlated with market returns, the U.S. Treasury may tend to value the warrants more highly than an objective weighting of the probabilities of an offering would suggest. This is because the number of warrants outstanding would be higher when the overall stock market falls. When the stock market rises, the probability that Goldman Sachs will complete a qualified equity offering will rise. Thus, the CPP warrants are more valuable because warrant reduction provisions are positively correlated with market returns. Since the low, middle and high probabilities are highly subjective, no additional adjustment is made for this hypothesized negative correlation between the number of CPP warrants and the movements of capital markets. When calculating the number of warrants, \( N_i \), the author used the following formula where \( p_i \) = subjective probability of the warrants’ being cancelled prior to January 1, 2010. Let \( i = L, M, \) or \( H \), depending whether this is the low-end, middle, or high-end estimate.

\[
N_i = [0.5(1 - p_i) + 0.5] * 12,205,045
\]

The low-end to high-end number of warrants outstanding at expiration are estimated at between 6.7 million and 11.6 million, reflecting optimistic and pessimistic expectations of Goldman Sachs’ ability and willingness to issue new equity before year’s end.
In contrast to the author’s subjective estimates, the Congressional Oversight Panel Report (2009, p. VIII – 3) puts the chances that half the Goldman Sachs warrants will be cancelled at between 80 to 43 percent. That report does not explicitly state their cancellation probabilities. The author estimated the Congressional Oversight Panel Report (2009, p. VIII – 3)’s cancellation probabilities by subtracting the ratio of the dollar value of the warrants subject to cancellation prior to a discount and the dollar value of the warrants not subject to discount by one. Thus, the author calculates that:

\[ 1 - \left( \frac{0.079}{0.389} \right) = 0.797 \] and
\[ 1 - \left( \frac{0.223}{0.389} \right) = 0.427. \]

Duff & Phelps, which conducted that study, estimates this by assuming that a qualified equity offering will be conducted if the fifty percent of the value of the 12.2 million warrants exceeds the transactions cost of a new equity issue. The Congressional Oversight Panel Report (2009, p. VIII – 3) does the simulation from the perspective of October 13, 2008. By May 1, 2009, there is far less time to complete a qualified equity offering. Moreover, the stock price has risen a few dollars since then ($127.08 versus $122.90). Finally, on May 1, 2009, Goldman Sachs is no more than $4.25 billion dollars away from completing a qualified equity offering. On October 13, 2008, it was arguably $10 billion dollars away from completing such an offering. For all these reasons, it does not seem appropriate to use the estimates of the cancellation probability that is reported in Congressional Oversight Panel Report (2009, p. VIII – 3).

To be consistent in the estimates, the dilution in Exhibit 2 created by warrant exercise is slightly lower in the low-versus-medium and medium-versus-high estimates, because we assume that in the low end scenario, fewer warrants are available to be exercised. Overall, the lower level of dilution has a small positive effect on the total value of the CPP warrants because it leads to a slightly higher price per warrant. The author calculates that the reduced dilution raises the price per warrant by $0.19, $0.11 and $0.01 in the low, medium and high scenario warrants, respectively. A much bigger effect is the reduction in the number of warrants, which has a large negative effect on the total value of the CPP warrants by 45, 22.5 and 5 percent, respectively, in the low, middle and high valuations.

### 2.2 Option Pricing Models Used

A call option gives the owner the right, but not the obligation, to buy a stock at a preset price. This preset price is called the *strike* or *exercise* price. The basic option pricing model presented by Black and Scholes (1973) attempts to value dividend-protected European call options. Dividend protection in the context of that model means that the stock price is not reduced by the payment of dividends. As far as the author knows, there are no such securities as dividend protected stock options or warrants. Merton (1973) adjusted the basic model of Black and Scholes (1973) to account for stocks that pay a continuous dividend yield. Since financial stocks and Goldman Sachs pay quarterly dividends, the model of Merton (1973) generates more accurate estimates of the value of both the CPP and Berkshire Hathaway warrants. Thus, in the low, medium and high estimates the dividend yield is decreasing from 2.75 percent, 0.87 percent and zero percent, respectively.

The 2.75 percent estimate represents the average continuously compounding dividend yield for the top six CPP recipient banks from January 2, 2002, to February 9, 2009. Those banks are Bank of America, Citibank, Goldman Sachs, JP Morgan Chase, Morgan Stanley and Wells Fargo. The 0.87 percent figure represents the average dividend yield of Goldman Sachs over the same period. The dividend yields were calculated by dividing
the quarterly dividends paid by the stock price on the first trading day on or following the ex dividend day. The author did not include special dividends in calculating the dividend yields. All dividend yields are adjusted for continuous compounding.

...With the book value of [Goldman Sachs’] assets at over 15 times the market value of equity on May 1, 2009, every additional dollar of equity can significantly reduce the volatility of the stock price, given that the volatility of total assets is unchanged.

Call options are traded on exchanges. A seller of a call option buys existing shares of stock to cover his or her obligations to sell the stock at the strike price. Thus the seller’s obligations are completed by purchasing the stock in the secondary markets. In contrast, obligations from selling warrants are fulfilled by the issuing firm, not by buying already issued stocks on secondary markets. The company issues more shares to fulfill its warrant obligations. This will lead to a dilution of existing shareholders’ percent ownership in the firm. Because warrants are exercised only when the strike price exceeds the stock price, the amount of money coming into the firm upon exercise does not fully compensate the existing stockholders for the increased number of shares outstanding. Thus, the stock price is pushed down by the prospect of the warrants being exercised.

This leads to warrants having a lower theoretical value than exchange traded call options. The author used the numerical procedure of Galai and Schneller (1978) to adjust for the effects of dilution on the value of the warrants. Goldman Sachs had 476.10 million shares outstanding, according to Yahoo! Finance on May 1, 2009. If all the TARP warrants were exercised, there would be 12.21 million new shares outstanding, according to SIGTARP (2009). In addition, if all the Berkshire Hathaway warrants were exercised, then there would be 43.48 million new shares outstanding, according to Goldman Sachs’ 2008 form 10-K page 98.

2.3 Volatility Estimates

<table>
<thead>
<tr>
<th>Rank (from Lowest to Highest)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>Monthly</td>
<td>Daily</td>
<td>Daily</td>
<td>Daily</td>
<td>Daily</td>
</tr>
<tr>
<td>Observations</td>
<td>85</td>
<td>530</td>
<td>279</td>
<td>67</td>
<td>111</td>
</tr>
<tr>
<td>Standard Error of Volatility Estimate</td>
<td>2.57%</td>
<td>4.36%</td>
<td>5.50%</td>
<td>5.55%</td>
<td>6.30%</td>
</tr>
<tr>
<td>Volatility</td>
<td>33.46%</td>
<td>69.13%</td>
<td>87.26%</td>
<td>88.03%</td>
<td>100.06%</td>
</tr>
</tbody>
</table>

Estimates were ranked from highest to lowest. All data was obtained from Yahoo! Finance.
Volatility was estimated using implied and historic volatility estimates. Exhibit 1 ranks the historic volatility estimates from lowest to highest. The historic volatility of Goldman Sachs’ stock depends greatly on the time period estimated. Historic volatility was estimated by the procedure outlined in Hull (2003, pp. 238 – 241).

2008 was an unusually volatile year for financials and the S&P as a whole. The period up to May 1, 2009, which began immediately after the Lehman Brothers collapse in mid September 2008, produced estimates of historic volatility for Goldman Sachs in excess of 100 percent per annum! This is estimate number five in Exhibit 1. One commentator noted that from 1950 to 2006 there was only a 0.01 percent, or about a 1 in 10,000, chance of daily market movement in excess of plus-or-minus ten percent. Yet in 2008 there were two trading days out of 252 that produced more than a 10 percent swing in the S&P 500. There were also many more plus-or-minus 2 – 10 percent swings in 2008 as a percent of trading days than in the 1950 to 2006 time period. 2009 has also been more volatile than the 1950 to 2006 average with many more 2 – 10 percent swings than the longer data series.10

...The author cautions that the per warrant valuations should be more reliable than the total valuation.

For this reason, the author chooses the third highest volatility estimate out of five as the input for the high-end estimate of the CPP and Berkshire Hathaway warrants’ value. The low-end volatility input looks at a longer time series from February 2009 to January 2002. This is the lowest historic volatility estimated.

Both the CPP and Berkshire Hathaway warrants and the new common equity were issued over six months ago. Thus, the author made no adjustments to his historic volatility estimates to reflect the increase in common equity’s component in the capital structure from the issuance of warrants or common equity in September and October 2008. In addition, no adjustments need to be made to the forward looking implied volatility estimates, which reflect the market’s beliefs of volatility in the near term and which will be discussed shortly. Yet, the $5.75 billion issuance of common stock in April 2009 could significantly affect the low-end and high-end volatility estimates with regard to the historic volatility estimates in the low and high valuation scenarios.

The author assumes that the issue of $5.75 billion of common stock in April 2009 will affect the volatility of Goldman Sachs’ stock price. This change in capital structure happened just after or just at the end of the historic volatility calculations. Thus Goldman Sachs’ historic volatility should be adjusted for this April 2009 common stock issue. Goldman Sachs had book assets of $925 billion, according to the first quarter 2009 earning announcement on April 13, 2009. Moreover, its market cap was $60.5 billion dollars on May 1, 2009. (Book common equity was $47.05 in April 2009.) Thus, with the book value of assets at over 15 times the market value of equity on May 1, 2009, every additional dollar of equity can significantly reduce the volatility of the stock price, given that the volatility of total assets is unchanged.11

We will use the procedure described in Brealey, Myers and Allen (2006, p. 588) to account for the reduced volatility associated with raising additional equity capital. This procedure produces a rough adjustment, but the author believes that it provides a forward looking estimate of volatility which is better than not accounting for the April 2009 Seasoned Equity Offering (SEO).

To adjust for the reduced volatility of the stock price due to the SEO in April 2009, we use the following formula:

$$\sigma_0^A = \sigma_0^E \frac{E_0}{A_0}$$  \hspace{1cm} (2)
The variable A is defined here as the book value of all assets, BVA, minus the book value of common equity, BVE, plus the market value common equity, E. \( A = B'VA - B'VE + E \).

Let us define \( E_0 = E_1 - (\text{SEO proceeds}) = $60.5 \text{ billion} - $5.75 \text{ billion} = $54.75 \). Thus, \( A_0 = $925.00 - $47.05 + $54.75 = $932.70 \).

In the low-end scenario, asset variance is \( 33.46\% \times ($54.75/$932.70) = 1.96 \) percent. In the high-end scenario, asset variance is \( 87.26\% \times ($54.75/$932.70) = 5.14 \) percent. After the SEO on May 1, 2009, \( E_1 = $60.5 \text{ billion} \). Thus \( A_1 = $925.00 - $47.05 + $60.50 = $938.45 \). The new equity variance is \( \sigma_{1E}^E \) where

\[
\sigma_{1E}^E = \sigma^A \left( \frac{A}{E_1} \right), \quad \text{where} \quad \sigma^A = \sigma_{1A}^A = \sigma_0^A. \tag{3}
\]

Using the formula in equation (3), the low-end volatility is \( 1.964\% \times ($938.45/$60.5) = 30.5 \) percent and for the high-end estimate volatility is \( 5.122\% \times ($938.45/$60.5) = 79.5 \) percent.

The mid-range estimate of volatility was estimated using implied volatilities. The implied volatilities are not adjusted for the new issue of equity because they are forward looking estimates. Buyers and sellers set prices for call options based in part on their expectations of the variance of the stock price. Thus, rational investors would have factored the April 2009 Seasonal Equity Offering into their beliefs about the volatility of Goldman Sachs’ stock price going forward. The downside of implied volatilities is that they are not forward looking enough. The farthest expiration date is less than two years away. Moreover, many option contracts are thinly traded. Thus, a relatively small player in the market could sell call options relatively cheaply and drive down the implied volatility.

To calculate implied volatilities, the author selected call options with expiration dates in July 2009, October 2009, January 2010 and January 2011. The strike prices chosen were between $115 and $140. These were the closest strike prices to the closing price of $127.08 on May 1, 2009.

Call options were used because the option pricing models of Black Scholes (1973) and Merton (1973) are much better at estimating the value of exchange traded American calls than exchange traded American puts. It is well known that it is generally optimal to exercise American call options on non-dividend-paying stocks on their expiration date. Yet, American put options often should be exercised earlier than their expiration date. The models of Black and Scholes (1973) and Merton (1973) estimate the value of European calls and puts which can only be exercised on their expiration date. Thus, implied volatility estimates from put options may reflect more the shortcomings of Black and Scholes (1973) and Merton (1973) option pricing models than expectations of market participants about the future volatility of the underlying asset.

Hull (2002, p. 251) argues that the most reliable implied volatility calculations come from options with exercise prices close to the current stock price. To calculate implied volatilities, the author inserted Goldman Sachs’ average dividend yield of 0.87 percent, the closing stock price of $127.08, the closing price of the option and the strike price of the option into the equations of the Merton (1973) model. Then, he numerically solved for the volatility consistent with those parameter values. The average implied volatility estimate was 52.47 percent.\(^{12}\) This was selected as the middle estimate of the volatility for determining the value of both the Capital Purchase Program Berkshire Hathaway warrants.

### 2.4 The Risk-Free Rate

All U.S. Treasury data was taken from Yahoo! Finance’s U.S. Treasury yield curve’s closing prices on May 1, 2009. The yield on the 10-year U.S. Treasury note was reported as 3.15 percent. This was converted into a continuously compounding yield by
\[ \ln(1 + .0315) = .0310. \] The 10-year T-note was used for the CPP warrants that mature in about 9.5 years. The five-year U.S. Treasury note was used as the risk-free rate for the Berkshire Hathaway warrants, which expire in about 4.4 years. This was converted into a continuously compounding rate by taking \( \ln(1 + .0201) = .0199. \) For implied volatilities, the rates used are calculated as \( \ln(1 + r), \) where \( r \) is the relevant U.S. Treasury rate reported.

3. Results

3.1 Valuing the CPP Warrants

Exhibit 2

Valuation of Capital Purchase Program’s GS Warrants on May 1, 2009

<table>
<thead>
<tr>
<th></th>
<th>Low</th>
<th>Middle</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volatility</td>
<td>30.47%</td>
<td>52.42%</td>
<td>79.46%</td>
</tr>
<tr>
<td>Dividend Yield</td>
<td>2.75%</td>
<td>0.87%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Probability that Half Warrants Will Be Cancelled</td>
<td>90%</td>
<td>50%</td>
<td>10%</td>
</tr>
<tr>
<td>Expected Number of Warrants</td>
<td>6,712,775</td>
<td>9,153,784</td>
<td>11,594,793</td>
</tr>
<tr>
<td>Per Warrant Value ($)</td>
<td>$38.44</td>
<td>$73.51</td>
<td>$103.17</td>
</tr>
<tr>
<td>Total Value of Warrants ($ Millions)</td>
<td>$258.05</td>
<td>$672.94</td>
<td>$1,196.28</td>
</tr>
</tbody>
</table>

The low and high estimates are based on observations ranked one and three on Exhibit 1. These estimates were adjusted for the April 2009 seasoned equity offering. The middle estimate of volatility is the average implied volatility from traded options sampled on May 1, 2009. The 2.75 percent dividend yield estimate is the average continuous dividend yield of the six largest CPP recipients from January 2, 2002 to February 9, 2009. The 0.87 percent dividend yield was the average continuously compounding dividend yield for Goldman Sachs from January 2, 2002, to February 9, 2009. The expected number of warrants is calculated using equation (1).

According to the term sheet of the CPP, half the warrants will be reduced if the recipient, Goldman Sachs, completes a qualified equity offering by December 31, 2009. Goldman Sachs was $4.25 billion short of completing a qualified equity offering. GS had already raised $5.75 billion in common equity since receiving the TARP funds by May 1, 2009. To complete a qualified equity offering, Goldman Sachs would have had to raise $4.25 billion more in equity to cancel half the TARP warrants. It is probable that half the warrants will be cancelled prior to 2010 given that no negotiated repurchase of the TARP warrants occurs prior to 2010. The cancellation probability is subjectively chosen by the author based in part on the bank’s relative proximity to completing a qualified equity offering.

The per warrant value is calculated with a May 1, 2009 closing stock price of $127.08 and a strike price of $122.90, which was reported in SIGTARP (2009, p. 47). The author used the option pricing model of Merton (1973) with the dilution adjustments proposed by Galai and Schneller (1978). The total value of warrants is the expected number of warrants multiplied by the per warrant value above.
In Exhibit 2, the Merton (1973) model is employed and adjusted for the dilution using the numerical procedure of Galai and Schneller (1978). The low, middle and high estimates are approximately $258 million, $673 million and $1,196 million. The estimates in this model are very sensitive to the assumptions about the probability of Goldman Sachs’ issuing $4.25 billion dollars in common or preferred stock to the general public by December 31, 2009, which would reduce the number of U.S. Treasury warrants by half. Thus, the author cautions that the per warrant valuations should be more reliable than the total valuation. The total valuation is based on the author’s very subjective estimate of the probability of a qualified equity offering before January 1, 2010.

The per warrant estimates are $38.44, $73.51 and $103.17 for the low, middle and high estimates, respectively. Note that if exercised on May 1, 2009, the warrants were only in the money by $127.08 – $122.90 = $4.18. Thus, it is very misleading to judge the value of warrants with about 9.5 years to expiration by measuring their intrinsic value. (Intrinsic value is the greater of zero and the difference between the stock price and the warrant’s strike price.) Over 9.5 years a volatile stock can rise substantially above its strike price to the benefit of whoever holds the warrant.

3.2 Berkshire Hathaway Warrants

Exhibit 3

Valuation of Capital Purchase Program’s GS Warrants on May 1, 2009

<table>
<thead>
<tr>
<th></th>
<th>Low</th>
<th>Middle</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volatility</td>
<td>30.47%</td>
<td>52.42%</td>
<td>79.46%</td>
</tr>
<tr>
<td>Dividend Yield</td>
<td>2.75%</td>
<td>0.87%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Per Warrant Value ($)</td>
<td>$30.62</td>
<td>$55.14</td>
<td>$79.33</td>
</tr>
<tr>
<td>Total Value of Warrants ($ Millions)</td>
<td>$1,331.35</td>
<td>$2,397.54</td>
<td>$3,449.01</td>
</tr>
</tbody>
</table>

The low and high estimates are based on observations ranked one and three on Exhibit 1. These estimates were adjusted for the April 2009 seasoned equity offering. The middle estimate of volatility is the average implied volatility from traded options sampled on May 1, 2009. The 2.75 percent dividend yield estimate is the average continuous dividend yield of the six largest CPP recipients from January 2, 2002 to February 9, 2009. The 0.87 percent dividend yield was the average continuously compounding dividend yield for Goldman Sachs from January 2, 2002, to February 9, 2009. These calculations are further explained in section 2.2.

The per warrant value is calculated with a closing stock price of $127.08 on May 1, 2009 and a strike price of $115, which was reported in the 2008 form 10-K page 98 for Goldman Sachs. The author used the option pricing model of Merton (1973) with the dilution adjustments proposed by Galai and Schneller (1978). The total value of warrants is the expected number of warrants multiplied by the per warrant value above. The total value of warrants is the number of warrants issued to Berkshire Hathaway, 43,478,261, multiplied by the per warrant value above.
Since we have estimated the parameters for the GS, we can apply these to value the Berkshire Hathaway warrants. Berkshire Hathaway received over three times more warrants (43 million vs. 12 million) for its $5 billion investment v. the taxpayer’s $10 billion investment. The strike price on those warrants was lower than the U.S. Treasury’s warrants. $115.00 < $122.90. Further, there is no provision by which half the Berkshire Hathaway warrants can be cancelled as there is with the CPP warrants. More warrants with lower strike prices are worth more than fewer warrants with higher strike prices. The one large, but not large enough, compensating factor in taxpayers’ favor was that the Berkshire Hathaway warrants only had five years to expiration when they were issued on October 1, 2008.

The methods used in this paper may be of interest to non-profit groups such as the Pew Charitable trust, which tracks the CPP warrants, [as well as] to U.S. Treasury officials, recipient banks and their advisors and investment bankers and consulting firms representing the U.S. Treasury.

In Exhibit 3, we estimate the value of the Berkshire Hathaway warrants using the most the Merton (1973) model adjusted for dilution using the procedure of Galai and Schneller (1978). While the Berkshire Hathaway warrants are worth less per share than the CPP warrants in Exhibit 2, which uses the same option pricing model, they are worth much more in total because there are 43.5 million of them outstanding versus 12.2 million of the Capital Purchase Program. The values of the Berkshire Hathaway warrants are $30.62, $55.14 and $79.33 in the low, middle and high estimates. This translates into these warrants’ being collectively worth about $1.33 billion, $2.40 billion, or $3.45 billion in the low-, middle- and high-end estimates.

4. Conclusion

This paper uses the Black and Scholes (1973) based models of Merton (1973) and Galai and Schneller (1978) to value the Capital Purchase Program (CPP) warrants of Goldman Sachs. The benefit of using Black and Scholes (1973) type methods as opposed to more flexible, binomial and Monte Carlo approaches as used in the Congressional Oversight Panel (2009)’s report is that the former are more transparent, more widely recognized and simpler to apply on a large scale. The methods used in this paper may be of interest to non-profit groups such as the Pew Charitable trust, which tracks the CPP warrants. The methods presented here may also be of interest to U.S. Treasury officials, recipient banks and their advisors and investment bankers and consulting firms representing the U.S. Treasury. Many investment banking, brokerage, consulting and advisory firms may be involved in the near future in the negotiating a repurchase of CPP warrants or in the marketing those warrants to third-party investors. This paper describes how to estimate the major inputs in those models, including the stock’s dividend yield and volatility. Since there are over 280 publicly traded banks that have received CPP funds, this paper could be used as a model for estimating the value of warrants in many other banks.

This paper values the CPP warrants of Goldman Sachs on May 1, 2009. It puts the value of each warrant at between $38 and $103 per warrant. The per warrant valuation depends on the volatility and dividend yield assumed. The total value of Goldman Sachs CPP warrants is between $.25 billion and $1.2 billion. The total valuation depends on the likelihood that Goldman Sachs will complete a qualified equity offering of $10 billion prior to January 1, 2010, as well as the volatility and dividend yield assumed. This paper has also valued the Goldman Sachs warrants purchased
by Berkshire Hathaway a month prior to the CPP warrant investment. This paper puts the value of those warrants at between $1.3 and $3.4 billion dollars.

The American Bankers Association has recently lobbied Congress to expunge or cancel the CPP warrants. Goldman Sachs has received one-twentieth of the CPP funds dispersed. Thus, if Goldman Sachs is representative, then the CPP warrants are worth between $5 billion and $24 billion. Thus, if Congress accedes to the lobbying efforts of the ABA, then it would be giving the banking industry a $5 – $24 billion dollar subsidy. That is a 2.5 to 12.0 percent subsidy of the first $198.8 billion dollars handed out in the CPP.

Expunging the CPP warrants would be a subsidy on top of the FDIC guaranteed debt that many banks have taken advantage of. Further, it would be a subsidy on top of the 18 percent subsidy rate reported by the Congressional Budget Office (2009) on the first $178 billion dollars of CPP funds. American taxpayers deserve to get the fair market value of the CPP warrants that they purchased. America’s banks don’t deserve any more subsidies.

References

Endnotes


2 Sources: Patrick Hosking and Leo Lewis, September 25, 2008, “Warren Buffett stake in Goldman Sachs earns $783 million return,” The Times (of London), accessed online on May 4, 2009, at: http://business.timesonline.co.uk/tol/business/industry_sectors/banking_and_finance/article4821506.ece.; Randall W. Forsyth, October 14, 2008, “Buffett Drives a Harder Bargain than Paulson: Banks get cheaper financing from Treasury than from Berkshire Hathaway,” Barron's, accessed online on October 15, 2008 at http://online.barrons.com/article/SB122401409814533513.html?mod=g The Treasury investment involved preferred stock that paid a dividend of five percent for the first five years and 9 percent thereafter. Warrants were attached to 15 percent of the preferred stock’s par value. Berkshire Hathaway bought preferred stock with 10 percent dividends and warrants on 100 percent of the purchase price about three weeks prior to the announcement of the CPP. According to page 98 of the Goldman Sachs 2008 10-K, the warrants bought by Berkshire Hathaway had a five-year life beginning on October 1, 2009. The Congressional Budget Office (2009) and the Congressional Oversight Panel (2009) estimate that the Treasury overpaid for its preferred stock and warrants in those banks.

3 Sources: Mark Landler and Eric Dash, October 15, 2008, “Drama Behind a $250 Billion Banking Deal,” New York Times, accessed online December 23, 2008 at: http://www.nytimes.com/2008/10/15/business/economy/15bailout.html?mod=yn The Treasury investment involved preferred stock that paid a dividend of five percent for the first five years and 9 percent thereafter. Warrants were attached to 15 percent of the preferred stock’s par value. Berkshire Hathaway bought preferred stock with 10 percent dividends and warrants on 100 percent of the purchase price about three weeks prior to the announcement of the CPP. According to page 98 of the Goldman Sachs 2008 10-K, the warrants bought by Berkshire Hathaway had a five-year life beginning on October 1, 2009. The Congressional Budget Office (2009) and the Congressional Oversight Panel (2009) estimate that the Treasury overpaid for its preferred stock and warrants in those banks.


6 Met Life was one of 19 institutions that were part of the stress test, but it never received government funds.

7 The author’s most preferred model is based on Black and Scholes (1973) and Merton (1973), but this model for the pricing of warrants was developed by Galai and Schneller (1978). Nevertheless, there was little difference in the valuation using Galai and Schneller’s (1978) methods as opposed to call option valuation model with a continuous dividend yield model, which was first developed by Merton (1973).


9 Ex is Latin for without. The ex dividend day is the trading day following the last possible day that the stock could be sold to another investor with rights to the next quarterly dividend. In the United States, because stock ownership does not officially take place until three trading days after a transaction is agreed upon, this means that the ex dividend day is two days prior to the date of record. The owner of the stock on the date of record is entitled to receive the quarterly dividend check.


12 There was little difference between the implied volatilities of long-dated options that expire in 2010 and 2011 and short-dated options that expired in a few months from May 1, 2009.

13 The Capital Purchase Program is part of the Troubled Asset Relief Program (TARP) that gave U.S. banks and bank holding companies cash in exchange for preferred stock and warrants.

14 Goldman Sachs, where Fisher Black, the coauthor of the option pricing formula Black and Scholes (1973), was a partner until his death, reportedly does not support the American Bankers Association’s efforts to have the CPP warrants expunged. Source: John Carney, Apr. 23, 2009, “Goldman Sachs Is NOT Lobbying to Expunge the TARP Warrants,” accessed online on May 1, 2009, at: http://www.businessinsider.com/goldman-sachs-is-not-lobbying – expunge-the-tarpwarrants- 2009-4
17

The Valuation of Tax Shields Induced by Asset Step-Ups in Corporate Acquisitions

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1. Executive Summary

Borrowing is not the only instrument that shields corporate income against taxes. Apart from interest payments, any other expense, but especially depreciation and amortization play a major role in determining the corporate tax liability. Asset step-up induced depreciation and amortization tax shields are created in the framework of corporate mergers and acquisitions.1 Asset step-ups allow the acquirer to increase (step-up) the pre-acquisition tax basis of acquired assets to the fair market value or the purchase price. The stepped up tax basis is fully depreciable/amortizable and thus provides additional tax shields and hence value, for the combined entity after the transaction.

In his empirical study of tax value in management buyouts, Kaplan (1989) estimates that for the companies in his sample, which chose to step-up the asset basis, the median value of the asset step-up is approximately 30 percent of the premium paid.2 To derive these figures, Kaplan (1989) examines a sample of 76 management buyouts of publicly held companies completed in the period 1980 – 1986. However, the Tax Reform Act of 1986 has reduced tax benefits of asset step-ups in mergers and acquisitions. Nevertheless, asset step-up structured transactions still occur on a regular basis, in particular for acquisitions of corporate subsidiaries and S corporations.

Still, asset step-ups can contribute a significant amount of value in the context of corporate acquisitions. As Erickson and Wang (2000) note, Cox Communications could generate asset step-ups worth about $350 million when it acquired the cable television business of Gannett Company for $2.7 billion in 1999.3 In their analysis, Erickson and Wang (2000) also find (at least) weak evidence that deal premiums in acquisitions of subsidiaries are higher in a case in which the deal is structured in a way that enables assets to be stepped up, thus indicating the additional value of asset step-ups. Moreover, Maydew et al. (1999) note that the value of asset step-ups is regularly evaluated by sellers in the context of divestitures of corporate subsidiaries in order to outline this information in the sales materials provided to potential buyers.4 Accordingly, the valuation of asset step-up induced depreciation tax shields via appropriate discount rates is a fundamental issue in the context of mergers and acquisitions.

To our knowledge, there is no consistent approach in corporate financial literature to value the tax shields of asset step-up based depreciations. Not even a practical model of how to determine appropriate discount rates for these tax shields can be found. Indeed, some empirical studies dealing with tax effects in corporate acquisitions use specific rates to discount asset step-up induced depreciations. However, those studies do not derive such
rates via analyses, but determine them arbitrarily. The contribution of this paper is to discuss all relevant parameters and to provide a consistent approach for the derivation of these discount rates.

We start with the risk-less after-corporate tax interest rate, which is, according to Ruback (1986), the appropriate rate to discount risk-less after-tax corporate cash flows, such as “regular” depreciation benefits. Ruback (1986) assumes depreciation tax shields to be free of risk. By dissolving Ruback’s assumptions, we derive corresponding discount rates via a case differentiation. For valuations conducted in the framework of the Adjusted Present Value approach we show that a discount rate \( r^* \) is adequate to value step-up induced depreciation benefits.

In the case that the valuation of the tax shield of asset step-ups is not conducted via the Adjusted Present Value approach, the tax advantage of debt is not accounted for in a separate term and thus has to be included in the discount rate of the cash flows to be valued. When accounting for its debt tax benefit, the depreciation tax shield can also be valued standalone. (The latter valuation setting will be referred to as standalone valuation in the rest of this paper.) Accordingly, the adequate discount rate is the after-tax weighted average of \( r^* \), where the weight is determined by the targeted capital structure of the merged entity. The rate \( r^* \) is between the firm’s cost of debt and the risk-free rate. For consistency the derived rate has to be used in combination with Graham’s (1996a) simulated marginal tax rates. A comparison of the discount rates proposed in this paper with the rates determined arbitrarily by the authors of some empirical studies on step-up depreciation induced tax shields shows that their chosen rates are in line with our derivation.

The rest of the paper is organized as follows. Section 2 provides a literature review regarding the derivation of discount rates for asset step-up induced depreciation benefits. Section 3 provides a high level overview regarding relevant tax aspects of asset step-ups. In Section 4, we describe our approach to derive an appropriate discount rate for asset step-up induced depreciation and amortization tax benefits. Section 5 concludes.

2. Literature Review

While finance textbooks and related research papers discuss the topic of debt tax shields, neither of them deal with the problem of deriving discount rates for asset step-up induced depreciation benefits. Only empirical studies of corporate acquisitions indicate the utilization of such rates.

Asset step-ups allow the acquirer to increase (step-up) the pre-acquisition tax basis of acquired assets to the fair market value or the purchase price.

Auerbach and Reishus (1986) analyze the tax consequences of mergers and acquisitions. In their study, they note that, in order to assess the tax incentives of two firms to merge, future saved tax payments which evolve in the case of a merger have to be evaluated via an appropriate discount rate. In fact, step-up induced depreciation benefits are a possible source for such savings. By explicitly using the term “appropriate,” Auerbach and Reishus (1986) imply that a discrete discount rate has to be derived for this kind of flow. In his study of the value of taxes in management buyouts, Kaplan (1989) argues that, when increased depreciations created by stepping up the asset basis are risk-less, the after tax cost of debt is the adequate discount rate. Since these flows are subject to both risks — the tax rate uncertainty and the uncertainty of utilizing the deductions — he finally quantifies the corresponding discount rate arbitrarily as being either 10 percent or 15 percent.
Schipper and Smith (1991) investigate how management buyouts affect corporate interest and depreciation tax benefits. When quantifying the benefits of estimated step-up induced depreciations, they employ “reasonable” discount rates of 5 percent to 10 percent, without commenting on the derivation or the use of the word “reasonable.” Erickson (1998) analyses the consequences of taxes on the structure of corporate acquisitions. In this framework he calculates the present value of additional tax benefits from asset step-ups at a discount rate of 12.5 percent. He also mentions that he derives similar results for the value of the step-up when using a discount rate of 10 percent, but slightly varying depreciation periods. Unfortunately, he does not justify the derivation of these figures.

In their study of the tax impact on the structure of a corporate divestiture, Maydew et al. (1999) use a discount rate of 10 percent to value the tax benefits induced by additional asset step-up-based depreciations. As with Erickson (1998), Maydew et al. (1999) do not provide any rationale of how they derive this discount rate. Erickson and Wang (2000) explore the effect of transaction structures on the premiums paid in subsidiary sales. When assessing the average value of one dollar of asset step-up, they use an after tax discount rate in the 10 percent range. Modeling the effect of the organizational form of the target on price and tax structure of the acquisition, Erickson and Wang (2005) also compute the present value of the tax savings from stepping up the tax basis. Depending on the useful life of the respective assets, they use seven percent or 10 percent as an “appropriate” discount rate. Although Erickson and Wang (2005) do not substantiate these figures directly, they add an alternative reasoning: analyzing their set of transactions it turns out that, in several cases, acquirers do report an estimate of their generated tax benefit’s present value. Based on the acquirers’ disclosures, Erickson and Wang (2005) calculate the corresponding discount rates to be in 7 – 9 percent range.

It is material to indicate that none of the mentioned empirical studies put any emphasis on the derivation/determination of discount rates for asset step-up induced depreciation benefits. Apart from Kaplan (1989), who considers corresponding risks, each study only briefly touches depreciation benefit’s discount rates. Summarizing, there is no consistent approach in corporate financial literature to value the tax shields of asset step-up based depreciations. The contribution of this paper is to provide a consistent approach to derive such rates.

3. Relevant Tax Aspects of Asset Step-ups

Asset step-ups are created in the framework of corporate mergers and acquisitions. Simplified, when the acquirer purchases the assets of the target, the buyer can increase (step-up) the pre-acquisition tax basis of acquired assets to the fair market value or the purchase price. The stepped-up tax basis is fully depreciable/amortizable. From a pre-tax view, depreciation and amortization are cash neutral; that is, a higher level of depreciation or amortization only reduces pre-tax profits, not pre-tax cash flows. However, deprecations and amortizations impact the value of a firm, since they are tax deductible.

Note that depreciation/amortization benefits of asset step-ups usually only come at a cost: the seller realizes a gain, since he sold his assets above book value, with this gain being taxed at the corporate tax rate. The seller’s cost in turn increases the purchasing price for the buyer, as the burden of the tax is in practice shared between acquirer and target. For most deal structures, costs of asset step-ups outweigh the depreciation benefits (Kaplan, 1989, pp.612 and Scholes et al., 2002, pp.320). Nevertheless, acquisitions may
also be carried out via deal structures that yield higher costs than the benefits of asset step-ups, since there may be non-tax issues favoring a certain transaction structure. Correspondingly, step-ups occur despite the specified costs and thus have to be valued in the framework of a corporate acquisition. If step-ups are available at a tax advantage for the seller or the buyer, then their valuation becomes even more important.

Asset step-ups can only be achieved in taxable acquisitions. In principle, acquisitions are taxable when the form of consideration is cash. When the form of consideration is stock, the acquisition is tax-free. There are basically two alternative deal structures of taxable acquisitions which enable the acquirer to step-up the asset base. Either the buyer purchases the target’s assets, or the buyer purchases the stock of the target and, in accordance with I.R.C. Section 338, elects to treat the acquisition of shares as if assets were acquired. For that case, the transaction is being taxed as if it were an asset sale.

Without discussing the details of corresponding tax laws it shall be emphasized that asset step-ups are not as important as they were prior to the Tax Reform Act of 1986. Nevertheless, asset deals are still a significant aspect of corporate acquisitions, in particular for acquisitions of corporate subsidiaries and S corporations, due to tax advantages versus share deals without Section 338 election. But also for acquisitions of C corporations step-up inducing transaction structures may be preferable, as various non-tax issues may be the driving factor for the deal structure decision. Accordingly, asset step-ups do occur, independent of the respective tax advantageousness. Hence, the valuation of step-ups via appropriate discount rates is a fundamental issue in the framework of corporate acquisitions. The next section is concerned with the derivation of such discount rates.

### 4. Discount Rates for Asset Step-up Induced Depreciation Tax Shields

#### 4.1. Basic Principles

In this sub-section we discuss the fundamentals for the derivation of appropriate discount rates for step-up induced depreciation benefits. In financial theory the discount rate has to reflect the risk of the flow to be valued. The risk characteristics of step-up induced depreciation benefits are unique. The depreciations are fixed once the assets are stepped up, but future income fluctuates, tax rates might change and default risk is omnipresent. Accordingly, it is material to derive an adequate discount rate. For the valuation of the step-up induced tax benefits, two alternative approaches are meaningful: a standalone valuation, which only calculates the net present value of the tax shield by applying a discount rate which includes the tax benefit of debt with respect to the financing mix, or a valuation via an additional term in the framework of the Adjusted Present Value method (Myers (1974), where the debt tax benefit is already accounted for in the second term of the APV-Formula.

The Adjusted Present Value method has been gaining importance in the recent past, not only among theorists, but also for practitioners. Due to the principle of value additivity, the APV is a very flexible tool for managers, enabling them to divide the valuation problem into several pieces that make managerial sense. Furthermore, additional sources of value, other than corporate operations and leverage, can be included into the analysis. For example, depreciation benefits that arise in the context of asset step-up structured acquisitions can be incorporated into the valuation. Under the assumption that the additional tax shield is available at a cost of zero, the APV-Formula to calculate the value of an acquired firm can be extended to:
The Valuation of Tax Shields Induced by Asset Step-Ups in Corporate Acquisitions

\[
V_{EV} = \sum_{i=1}^{t} \frac{E(FCF_i)}{(1+r_i)} + \sum_{i=1}^{t} \frac{E(CTS_i)}{(1+r_{CTS})} + \sum_{i=1}^{t} \frac{E(DTS_i)}{(1+r_{DTS})}
\]  

where:

- \(V_{EV}\) = Value of the firm at present
- \(FCF\) = Free after-tax cash flow of the acquired operating business, calculated as if it was all equity financed
- \(r\) = Operating cost of capital of the combined entity
- \(CTS\) = Debt tax shield
- \(r_{CTS}\) = Discount rate for the debt tax shield
- \(DTS\) = Tax shield due to depreciation/amortization of the asset step-up
- \(r_{DTS}\) = Appropriate discount rate for the DTS of the combined entity
- \(t\) = Period
- \(T\) = Forecast horizon (assuming either a final payoff or continuing values for the three terms of the equation)

The idea to consider the value of the asset step-up within the context of the APV-formula is based on Locke (1990) and Tirtiroğlu (1998), who separately account for the value of depreciation-based tax shields in the framework of property evaluation.

To be entirely accurate we would have to derive an appropriate discount rate for each future period in which step-up induced depreciation benefits occur. As in corporate valuation practice, the approach of this paper is to use one discount rate for the entire forecast period. We start with the risk-less after-corporate tax interest rate, which is, according to Ruback, the appropriate discount rate to value risk-less after-tax corporate cash flows (Ruback assumes depreciation tax shields to be free of risk; Ruback, 1986, p.327). Ruback analyzes the market value of risk-less after-corporate-tax cash flows via an arbitrage approach. By issuing risk-less debt a firm can precisely offset the value of a risk-less after-tax future cash flow when incorporating the interest deductibility of debt into the financing schedule. Ruback’s arbitrage approach shows that a risk-less after-tax cash flow \(CFT\) to be realized in the future period \(T\) can be valued with the after-corporate-tax rate of risk-free return (Ruback, 1986, Equation 2):

\[
V(CF_T) = \frac{CF_T}{(1+r_f(1-\tau))^T}
\]

where:

- \(r_f\) = The risk-free rate of return
- \(\tau\) = The corporate tax rate

Ruback explicitly refers to depreciation tax shields as being risk-less cash flows whose market value can be determined via this rate (Ruback, 1986, p.327). Moreover, Kaplan makes use of Ruback’s discount rate in his empirical study about taxes as a source of value in management buyouts. His (brief) approach of deriving adequate discount rates for step-up induced depreciation benefits is based on Ruback’s after-tax cost of (risk-less) debt (Kaplan, 1989, p.619). We conclude that Ruback’s discount rate has been designed and applied for the valuation of depreciation-induced tax benefits and thus is an appropriate starting point for the analysis in this paper.

4.2. Derivation of Discount Rates

Next, Ruback’s (1986) assumptions will be assigned. There are three central assumptions for Ruback to derive the after-corporate-tax risk-free rate. First, it has to be stressed that Ruback’s discount rate applies to after-tax cash flows. This assumption is in line with our model, as step-up induced depreciation benefits are after-tax flows, too. Every additional dollar of step-up induced depreciation tax shield increases the after-tax cash flow of a firm by one dollar, as it reduces the tax burden by one dollar. Accordingly, the depreciation benefits to be analyzed, namely...
those that are asset step-up induced, fit into Ruback’s framework. Ruback then hypothesizes that the cash flows to be valued are entirely financed with debt (also compare Sick, 1990, p.1438). Finally, he assumes that these cash flows are risk-less streams. Both latter assumptions are not realistic for step-up induced depreciation tax shields. Hence, this paper proceeds by resolving these two restrictive assumptions and applying a more realistic framework towards step-up induced depreciation tax benefits.

Initially, we address the fact that depreciation benefits are not entirely financed with debt. Those benefits, as any other corporate cash flow, are usually levered. To analyze the effect on the discount rate we introduce a case differentiation. **Case 1** refers to a valuation of the step-up induced depreciation benefit in the context of an Adjusted Present Value approach. The APV formula quantifies the contribution of debt tax shields to firm value in a separate term. The operating business is treated as being unlevered (as valued via the first term in the APV). This also holds true for the step-up induced tax shields to be valued in the third term. Due to the fact that the debt tax benefit is already accounted for in the second term of the APV formula, Ruback’s after-corporate-tax risk-less discount rate has to be modified to the risk-free rate. Such a proceeding regarding the valuation of depreciation benefits in the context of adjusted present valuation is also promoted by Tırtıroğlu, who assumes these benefits to be free of risk (Tırtıroğlu, 1998, p.299, Formula 1b).

**Case 2** refers to a standalone valuation of the step-up induced depreciation tax shield. Since leverage has to be accounted for in this case, the corresponding tax benefit can be realized according to the corresponding leverage ratio. Our first assumption is that the tax shield is levered to the same extent as the entire corporation. Note that the leverage ratio of the combined entity (after the acquisition) has to be considered in this context. Although the depreciation step-ups to be evaluated are entirely derived via the assets of the target, those tax benefits are realized by the combined entity in the periods after the acquisition. In corporate valuation, target leverage ratios are usually utilized instead of current leverage ratios in the context of estimating discount rates (Copeland et al., 2000, p.203). While target capital structures of firms are normally aimed to be met in no longer than three to five years, most assets are depreciated over a significantly longer schedule. Accordingly, a part of the step-up induced depreciation benefits is realized after the target ratio is met, while the remainder is realized when the target ratio is partially met.

We conclude that the target leverage ratio is a better proxy for the valuation of depreciation benefits than the current leverage ratio. When anticipated shifts in corporate capital structure are material, it is more efficient to use an APV approach for valuation of depreciation benefits. According to the rationale above, the formulas for the depreciation tax shield’s discount rate $r_{DTS}$ for the two cases are as follows:

$$r_{DTS} = r_{DTS}^{('APV')} = r_f;$$

for APV-based valuations

$$r_{DTS} = r_{DTS}^{('standalone')} = l_{tie}(1-\tau)r_f + (1-l_{tie})r_f;$$

for stand-alone valuations

where:

$l_{tie} = \quad$ The target leverage ratio of the combined entity after the acquisition
significantly due to the volatility of investments in depreciable assets. These variations are not predictable. Moreover, realizable special and general depreciation tax shields vary unpredictably, depending on the levels of corporate tax rates and corporate profits.

The following paragraphs first describe which sources of uncertainty persist for step-up based depreciation tax shields and thereon show how the discount rates of Equations (3) and (4) have to be further adjusted to account for these uncertainties. Bodington also classifies depreciation benefits as being not free of risk. He points out that, in his experience, sellers and buyers of assets discount such flows at a risk-adjusted rate (Bodington, 2003, p.230, Footnote 17).

Before assigning relevant uncertainties to the discount rate, it is essential to discuss their character. There are four important uncertainties inherent in step-up based depreciation benefits:

• default risk,
• an uncertainty regarding the usability of the shields,
• an uncertainty concerning changing corporate marginal tax rates and
• the acquirer’s difficulty in assessing the temporal distribution of the asset step-up induced depreciation benefits ex ante

For most deal structures, costs of asset step-ups outweigh the depreciation benefits.

The most obvious source of uncertainty is default risk. As firms may go out of business, it is uncertain whether future depreciation benefits resulting from an asset step-up can be realized. Secondly, there is the risk that firms are not able to use the entire amount of the tax shield immediately (hereafter also referred to as the uncertainty of tax shield usability). There are several aspects of the tax code driving this uncertainty. For example, in the case of negative taxable income, a certain portion of corporate tax shields and thus also a certain portion of step-up induced depreciation benefits, cannot be utilized to shield taxes from gross income in the current period. Due to tax loss carry-forwards and carry-backs, this negative taxable income can be utilized to shield gross income in other periods. Under current U.S. tax law, net operating losses can be carried forward up to 20 years and carried back up to two years to reduce taxable income in those years. Correspondingly, carry-forwards and carry-backs result in lower tax shields at present and in higher tax shields in the future (namely, the period into which the unused shield is carried forward) and in the past. Firms usually generate positive levels of taxable income, meaning they are utilizing all of their tax shields. But the fact that in economic downturns a good proportion of firms often generate taxable losses proves that this source of uncertainty is realistic and has to be included into the valuation of depreciation tax shields.

Other factors possibly altering the usability of depreciation tax shields are the alternative minimum tax and the amount of other corporate tax shields, such as interest tax shields. Another component of the tax shield which contributes to its uncertainty is the marginal tax rate and its volatility (hereafter also referred to as the tax rate risk). As discussed in the previous section, the marginal tax rate is often estimated via the statutory corporate tax rate. In his empirical study, Kaplan also identifies the latter two uncertainties in the context of valuing step-up induced depreciation tax shields as uncertainties increasing the corresponding discount rate (Kaplan, 1989, p.620). Moreover, the uncertainty of tax shield usability has been mentioned by Schipper and Smith in the context of valuing step-up induced depreciation benefits (Schipper and Smith 1991, p.298).
The final source of risk for the depreciation tax shield is the uncertainty regarding the temporal distribution of the asset step-up induced depreciation benefits. It can be difficult to estimate how the step-up amount is allocated among the different asset classes, in particular for outsiders. Whether an asset is classified as I.R.C. Section 197 intangible (Asset Classes VI and VII) or as belonging to another asset class determines whether the related stepped up amount is amortized linearly over 15 years or depreciated according to the respective depreciation schedule. This problem is also documented by Schipper and Smith in their analysis of depreciation deductions for management buyouts (Schipper and Smith, 1991, pp. 297). Another complexity in this context is the age of the acquired assets. The age is the determinant for the depreciation schedule which, in turn, affects the temporal distribution of the step-up induced deprecations. Summarizing this descriptive paragraph, note that default risk and the uncertainty of usability only evolve downside potential for the value of the total shield, while the other two sources of uncertainty include both downside as well as upside potential.

Next, these sources of uncertainty are to be assigned and incorporated into the discount rate. First, we consider the uncertainty of usability. As per the definition, the marginal tax rate includes the uncertainty of tax shield usability, since it is defined via the present value of current and expected future cash flows paid to tax authorities due to earning one additional dollar of taxable income (Shevlin, 1990, pp. 51; Graham, 1996b, p. 190; Scholes et al., 2002, p. 157). However, the need to consider the uncertainty of usability is dependent upon which measure for the marginal tax rate is used. When the statutory tax rate is utilized, this risk has to be additionally incorporated into the discount rate, since, e.g., possible negative taxable incomes in combination with tax-loss carry-forwards and carry-backs are not accounted for. We recommend using Graham’s simulated tax rates. The reason is that Graham concludes that simulated tax rates are the best proxy for the marginal tax rate (Graham, 1996b, p. 189).

Every additional dollar of step-up induced depreciation tax shield increases the after-tax cash flow of a firm by one dollar, as it reduces the tax burden by one dollar.

Schipper and Smith (1991) emphasize that it is fundamental to have a good proxy for the marginal tax rate. They state that the marginal tax rate is a key determinant between tax benefits and tax deductions in the framework of increased depreciation deductions achieved by step-ups. In contrast to statutory tax rates, Graham’s simulated tax rates do account for the uncertainty of tax shield usability. Based on the work of Shevlin (1990), Graham (1996a) derives the marginal corporate tax rate via simulation. His simulative proceeding in particular accounts for the following aspects: uncertainty about the level of taxable income, the progressivity in the corporate statutory tax code, net operating loss carry-backs and carry-forwards, state, local and foreign taxes, tax credits, the alternative minimum tax and the level of financing and investment related tax shields.

According to Graham’s approach, taxable income (while being assumed to follow a random pattern) is simulated to account for all periods in which carry-backs and carry-forwards can occur. After adding a single dollar of taxable income the present value of marginal taxes is determined, i.e., with the possibility of carry-backs and carry-forwards, etc., being accounted for. Each simulation provides an estimate and the average of all simulations is taken as a proxy for the marginal tax rate.
Admittedly, Graham did not derive his simulated tax rate exclusively for calculating step-up induced depreciation benefits, but for determining a proxy for the marginal tax rate of a firm. Therefore, we have to discuss whether his simulated tax rate is also an appropriate multiplier for the (stepup induced) enhanced depreciation amount. This is certainly the case if all aspects that are included in the derivation of the simulated tax rates, which have an impact on the level of taxes effectively paid by the firm, also have an impact on the value of the depreciation benefit. Analyzing Graham’s incorporated aspects, it can be argued that the inclusion of tax credits, which does not have an effect on the value of asset step-up induced depreciation, is possibly lowering the corporate tax burden and thus the marginal tax rate (Graham and Lemmon, 1998, p. 58). The fraction of the respective depreciation effectively shielding taxes is not altered by tax credits, since tax credits can only be used if taxable income and the resulting gross tax (as calculated via taxable income times the statutory tax rate) are positive. In such a case, the depreciation can be fully used to shield taxes irrespective of the level of tax credits. Amounts of (nonrefundable) tax credits that exceed the gross tax liability can be carried forward. All other aspects included by Graham affect the value of the step-up induced depreciation benefits. Those aspects can either alter the portion of step-up induced depreciation effectively shielding taxes and thus have an impact on the usability of depreciation tax shield (uncertainty about the level of taxable income, net operating loss carry-backs and carry-forwards, the alternative minimum tax and the level of financing and investment related tax shields), or they can have an effect on the value of the depreciation benefit via the statutory tax rules (the progressivity in the corporate statutory tax code and state, local and foreign taxes).13

Altogether, the simulated tax rate has to be considered an appropriate multiplier for asset step-up based depreciation, as only one out of all seven included aspects is not relevant for the valuation of step-up induced depreciation benefits.

Concluding our consideration of the uncertainty of usability, we find that by using the simulated marginal tax rate as a multiplier for depreciation, we are able to include all aspects driving the uncertainty of tax shield usability. Graham’s (1996a) simulated tax rates are broadly utilized in academic research.14 Based on the use of this simulated marginal tax rate, no further adjustment of the discount rate has to be carried out when incorporating the uncertainty of tax shield usability.

The next intermediate result for the valuation of step-up induced depreciation benefits is:

\[ V_{DTS} = \sum_{t=1}^{\tau_m} \frac{SUD_t \tau_m}{(1 + r_{DTS})^t} \]  

(5)

where:

\[ r_{DTS} = r_{DTS}^{''}(APV) = r_f \]  

for APV-based valuations

\[ r_{DTS} = r_{DTS}^{''}(standalone) = l_{Tax} (1 - \tau_m) r_f + (1 - l_r) r_f \]  

for stand-alone valuations

\[ V_{DTS} = \] The value of step-up induced depreciation tax benefits

\[ \tau_m = \] The (simulated) marginal tax rate of the combined entity

\[ SUD = \] The amount of step-up induced depreciation

Note that the marginal tax rate to be used has to be the marginal rate of the combined entity after the acquisition. The rationale is concordant with the previous section when discussing the appropriate leverage ratio.

Next, the tax rate risk has to be allocated. For this purpose, we have to analyze the
volatility of Graham’s simulated tax rates, since we promote the use of these rates as a measure for the marginal tax rate. In the previous paragraph we described the aspects that influence the derivation of Graham’s simulative tax rates. As these aspects are the determinants of the simulated marginal rate, it is their volatilities which ultimately drive tax rate volatility. Thus, their volatilities are to be analyzed next. Since, in Graham’s approach, taxable income is simulated to derive the marginal tax rate, the corresponding volatility is already accounted for and may not be considered again. Other volatility drivers have to be examined.

The target leverage ratio is a better proxy for the valuation of depreciation benefits than the current leverage ratio.

Looking at Graham’s tax rate determinants, it turns out that changes in the corporate statutory tax code, state, local and foreign taxes, modifications of the regulations regarding net operating loss carry-backs and carry-forwards and revisions of the alternative minimum tax code, are potential sources of uncertainty that have to be considered. Note that all potential sources are based on changes in corporate tax laws, but such changes occur rather infrequently. When comparing the frequency of changes of the corporate tax law with the frequency of changes in the level of corporate debt or security prices, it becomes evident that the volatility arising from changes in tax laws is of secondary importance. For example, in the last 50 years there have only been nine changes of top statutory tax rates for ordinary income of C corporations (the most important tax variable for firms). Furthermore, such changes, if they occur, do not usually alter the tax rate extraordinarily. Summarizing, no adjustment of the discount rate for step-up induced depreciation tax shields needs to be undertaken. Equations (5) – (7) remain unchanged.

The next source to be introduced is default risk. Default risk is priced by a credit spread. However, increasing the risk-free rates of Equations (6) and (7) up to the cost of debt would be an exaggeration, since default risk for debt and interest payments is higher than for depreciation tax shields. The rational is as follows: When calculating credit spreads, lenders have to include two scenarios; the debtor filing for bankruptcy protection under Chapter 7 or Chapter 11. Under these scenarios the lender may either lose all or only parts of his claim. Hence, the corresponding risk premium will reflect this expectation.

For depreciation benefits, this issue is different. If a firm files for Chapter 11 and manages to escape from bankruptcy after the reorganization, the value of its tax shields can be (partially) saved via tax loss carry-forwards. Since the profitability shifts occurring during the reorganization are accounted for in Graham’s simulated tax rates, the default risk of successful Chapter 11 reorganizations is already considered via the uncertainty of tax shield usability and may not be included in the default risk premium once more. After that, only the risk that the respective firm might eventually go out of business by ceasing operations has to be considered. When a corporation is liquidated, the value of all tax attributes vanishes. According to the rationale above, default risk involved for principal and interest payments is slightly more extensive than default risk for depreciation tax shields. Correspondingly, the (risk-free) rates of return used in Equations (6) and (7) have to be increased, but not to the full extent up to the cost of debt. Therefore, the new rate $r^*$ is between the cost of debt and the risk-free rate. Since, in the United States, Chapter 7 filings are more frequent than Chapter 11 filings and due to the fact that not every Chapter 11 yields a successful reorganization, we note that $r^*$ is closer to the cost of debt than to the risk-free rate. Accordingly, Equations (6) and (7) change to:
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For APV-based valuations

\[ r_{\text{DTS (APV)}} = r^*; \]

(8)

For stand-alone valuations

\[ r_{\text{DTS (standalone)}} = \left( 1 - \tau_{\text{mce}} \right) r^* + \left( 1 - \tau_{\text{mac}} \right) r^*; \]

(9)

where:

\[ r_f < r^* < r_d \]

\[ r_d = \text{The cost of debt of the combined entity} \]

When determining \( r^* \), the financial analyst has to bear in mind that cost of debt of the combined entity after the acquisition has to be considered in this context.

Finally, we take a look at the fourth source of uncertainty, the uncertainty regarding the temporal distribution of the additional depreciations. Knowledge of this temporal distribution is simply a question of data availability. While for deal outsiders it is rather difficult to obtain sufficient information for reliable estimates, the situation is different for potential acquirers in their due diligence process. As Maydew et al. (1999) mention, their discussions with M&A professionals indicate that step-up induced depreciation benefits arising in the context of asset deals are determined by target firms, because they are regarded as an integral part of the acquisition price. Moreover, these benefits are even outlined in the sales materials provided to the potential buyers. Accordingly, this uncertainty is not expected to be material for due diligence insiders and hence, not accounted for in our approach.

4.3. Results

Before summarizing our essays on the derivation of discount rates for step-up induced depreciation benefits, we also have to consider possible interdependencies of the relevant uncertainties. Fortunately, the examination of interdependencies is straightforward in the context of our analysis. Since tax rate risk is negligible and we assume that there is no uncertainty about the temporal distribution of the additional depreciations, the problem narrows to the interdependency between the uncertainty of the usability of the tax shields and default risk. Actually, the interdependence does not matter, since the two effects are considered separately via two different variables (and not via two parallel, fixed premiums on Ruback's discount rate): default risk is incorporated via a premium on the risk-free rate while usability uncertainty is accounted for by means of Graham's (1996a) marginal tax rate.

By using the simulated marginal tax rate as a multiplier for depreciation, we are able to include all aspects driving the uncertainty of tax shield usability.

Summarizing the approach to deduce an appropriate discount rate for the valuation of asset step-up induced depreciation benefits:

- First, we recommend using Graham's simulated corporate tax rates as a measure for the marginal tax rate.

- Second, we refer to a discount rate as per equations (8) and (9) in the framework of equation (5). The discount rates \( r_{\text{DTS (APV)}} \) and \( r_{\text{DTS (standalone)}} \) can easily be calculated by corporate insiders, as all relevant parameters should commonly be available for the respective financial planners, as are Graham's simulated tax rates.

Exhibit 1 shows the comparison of the discount rates for step-up induced depreciation tax shields, as utilized by empirical studies evaluating depreciation benefits, with the corresponding rates derived by our approach. For each discount rate derived by the empirical studies introduced in Section 2, the rates \( r_{\text{DTS (APV)}} \) and \( r_{\text{DTS (standalone)}} \) are calculated based on the
average risk-free rate of the corresponding period of the analysis. The rates as used in the empirical studies in each case refer to a relatively large subset of firms; they are not company-specific. Correspondingly, the derivation of \( r_{DTS} \text{(APV)} \) and \( r_{DTS} \text{(standalone)} \) for Exhibit 1 is not company-specific either, but an economy-wide assessment. It shall be a measure for the respective company subset.

Pursuant to our rationale of default risk incorporation, we add three quarters of the average risk premium for investment grade corporate debt onto the average risk-free rate to derive \( r^* \). The average risk premium for investment grade corporate debt, to be added onto the yield to maturity of U.S. 10-Year Treasury Bonds, is approximately two percent for bond ratings around BBB and BB.\(^{19}\)

Concerning the calculation of the standalone discount rate, a few more assumptions are required. Regarding the leverage ratios, we refer to Liu (2005). She finds debt/equity ratios declining from 45 percent in 1980 to approximately one third in 2000.\(^{20}\) The marginal tax rate can vary significantly among industries, firms and periods. Since a relatively big sample of companies is involved for each of the mentioned studies, it seems fair to estimate the average marginal corporate tax rate for each period of analysis via annual averages calculated from Graham’s entire sample of simulated tax rates for pre-interest income, which includes more than 10,000 firms.
Exhibit 1  Comparison of discount rates for asset step-up induced depreciation benefits between rates formerly used by empirical studies and rates derived in this paper

<table>
<thead>
<tr>
<th>Author</th>
<th>Period of Analysis</th>
<th>Derived Discount Rate</th>
<th>Average $r^1$</th>
<th>Average $\tau^2$</th>
<th>Measure for the Marginal Rate</th>
<th>IDTS (APV) $^3$</th>
<th>IDTS (standalone) $^4$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaplan (1989)</td>
<td>1980 – 1986</td>
<td>10 or 15%</td>
<td>11.5%</td>
<td>46.0%</td>
<td>statutory tax rate + downw. adjmt $^4$</td>
<td>13.0%</td>
<td>10.7%</td>
</tr>
<tr>
<td>Schipper Smith (1991)</td>
<td>1982 – 1986</td>
<td>5 or 10%</td>
<td>11.0%</td>
<td>46.0%</td>
<td>statutory tax rate (46%)</td>
<td>12.5%</td>
<td>10.4%</td>
</tr>
<tr>
<td>Erickson (1998)</td>
<td>1985 – 1988</td>
<td>10 or 12.5%</td>
<td>8.9%</td>
<td>41.5%</td>
<td>Graham's trichotomous rate $^7$</td>
<td>10.4%</td>
<td>9.0%</td>
</tr>
<tr>
<td>Maydew et al. (1999)</td>
<td>1987 – 1995</td>
<td>10%</td>
<td>7.6%</td>
<td>35.0%</td>
<td>statutory tax rate (35%)</td>
<td>9.1%</td>
<td>8.2%</td>
</tr>
<tr>
<td>Erickson Wang (2000)</td>
<td>1994 – 1998</td>
<td>&quot;10% range&quot;</td>
<td>6.3%</td>
<td>35.0%</td>
<td>statutory tax rate (35%)</td>
<td>7.8%</td>
<td>7.2%</td>
</tr>
<tr>
<td>Erickson Wang (2002) I</td>
<td>1994 – 2000</td>
<td>7 or 10%</td>
<td>6.2%</td>
<td>35.0%</td>
<td>statutory tax rate (35%)</td>
<td>7.7%</td>
<td>7.0%</td>
</tr>
<tr>
<td>Erickson Wang (2002) II</td>
<td>1994 – 2000</td>
<td>7%</td>
<td>6.2%</td>
<td>35.0%</td>
<td>N.A. $^3$</td>
<td>7.7%</td>
<td>7.0%</td>
</tr>
</tbody>
</table>

Notes:

1 Estimated via corresponding YTMs of more actively traded 10 year Treasury Bonds, average rate for corresponding period of analysis
   Source: Department of the Treasury of the United States of America

2 Top marginal rates of the federal corporation income tax (on ordinary income), average rate for corresponding period of analysis
   Source: Scholes et al. (2002)

3 $r^* = 1.5$ percent; estimated by adding 75 percent of the average 1999 risk premium for investment grade corporate debt, (2 percent) onto $r$

4 $\tau_c$ is estimated via average rates for the corresponding period of analysis. These rates are taken from Graham’s sample of pre-interest income based simulated tax rates

5 To account for uncertainties in the tax rate and of benefit utilization, Kaplan conducts a downward adjustment of the depreciation benefit’s multiplier

6 In their 2002 study Erickson and Wang mention two set of discount rates for valuing step-up induced depreciation benefits. Please refer to Section 2 for further details

7 Variable takes a value of 0 if acquirer has both NOLs and negative taxable income, a value of one-half the top statutory tax rate if the acquirer had either a NOL or neg. taxable income or a value of the top statutory tax rate in case the acquirer had neither a NOL nor neg. taxable income. Erickson alternatively uses a NOL dummy variable which takes the value of 1 in case the acquirer has a NOL in the year prior to the deal and the value 0 otherwise.

8 Not available
As all of the mentioned studies in Exhibit 1 estimate the step-up induced depreciation tax shield via stand-alone valuation, we have to compare the rates used in those studies with \( r_{DTS} \) (standalone). It stands out that, except for Kaplan (1989) and Schipper and Smith (1991), all studies use relatively high discount rates compared to our calculations. A possible reason for this pattern is that those studies by the majority use statutory tax rates when valuing the depreciation benefits. Accordingly, they have to additionally incorporate the uncertainty of tax shield usability into the discount rate, probably increasing the rate. The discount rates used in literature so far are estimated in a rather vague manner, i.e., via ranges or alternative rates that vary significantly. Moreover, these rates are not derived, but chosen arbitrarily. This paper contributes to financial research related to corporate acquisitions via a comprehensive discussion of all relevant parameters influencing the discount rates for the valuation of step-up induced depreciation benefits and by deriving a pricing formula.

4. Conclusion

This paper discusses the relevant parameters and introduces an approach to derive discount rates for asset step-up induced deprecations and amortizations created in the context of corporate mergers and acquisitions. Academic research in corporate finance does not provide a consistent approach towards the valuation of step-up induced depreciation and amortization tax shields. Specifically, a model of how to determine adequate discount rates for these tax shields cannot be found.

While some empirical studies, which examine tax benefits in the framework of corporate acquisitions, use specific rates to discount the value of these depreciation and amortization benefits, corresponding analyses and derivations are notably short. The rates are determined arbitrarily, not via analysis. Hence, this paper contributes by deducting particular discount rates for the valuation of such benefits via an integrated approach. By including all relevant sources of uncertainty for asset step-up induced tax shields and by accounting for corporate debt financing, we show that for APV valuations \( r^* \), a rate between the firm’s cost of debt and the risk-free rate, is adequate to discount step-up induced depreciation and amortization benefits. For standalone valuations, the adequate discount rate is the after-tax weighted average of \( r^* \).

When applying these rates, Graham’s (1996a) simulated marginal tax rates have to be utilized, accounting for the uncertainty of tax shield usability. Moreover, this paper compares these rates with the rates determined arbitrarily in empirical research on the valuations of tax shields of step-up induced deprecations. It becomes evident that the rates used in these studies are in line with the general results derived in this paper.

References


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Endnotes

1 In this paper, for convenience, we use the terms “depreciation benefits” or “depreciation tax shields” as shorthand for benefits or tax shields induced by depreciation and amortization.

2 33 out of the 76 companies elected to step-up the asset basis and 30 out of those 33 generated a positive value for the asset step-up. The 30 percent of the transaction price relates to these 30 companies. Furthermore, the value of 30 percent of the purchase price is net of costs for the asset step-up. Nevertheless, it is important to mention that, in Kaplan’s (1989) analysis, the benefit of the asset step-ups is much smaller than the benefit of interest deductions.

As a source, Maydew et al. (1999) refer to several discussions with M&A advisors.

This range for the discount rate is determined under the assumption of a 35 percent corporate tax rate and an average depreciation/amortization period of 10 – 15 years; see Erickson and Wang (2000), p. 81.

According to Scholes et al. (2002), pp. 323, there are four major non-tax issues in this context: costs of financial reporting, such as adverse earnings effects; contingent liabilities; managerial issues, as for example a possible dilution of ownership in case of a mainly managerially-owned buyer purchasing the stocks of the seller; and finally, transaction costs.

In the case that the purchased entity is a corporate subsidiary, the buyer and the seller can, according to Section 338(h)(10), jointly elect to treat the share deal as an asset deal.

Inselbag and Kaufold (1989), p. 87, stress the increased popularity of the APV technique, especially among theorists. This view is affirmed by Inselbag and Kaufold (1997), p. 114. Luehrman (1997), p. 135, emphasizes that the APV is also increasingly applied in professional companies.

For a detailed derivation of this arbitrage approach to determining the discount rate of risk-less after tax cash flows, refer to Ruback (1986), pp. 326.

Note that the depreciation tax shields that Ruback mentions are the tax benefits that stem from conventional asset depreciation of the firm, while the specific depreciation tax shields examined in this paper are asset step-up induced in the framework of corporate acquisitions via an asset deal structure.

Actually, Kaplan (1989) bases his approach to deriving an adequate discount rate for the step-up induced depreciation benefits on the after-tax cost of debt, rather than on the after-tax cost of risk-less debt. But, since he explicitly references to Ruback (1986), it has to be assumed that he bases his approach on Ruback’s (1986) rate.

For more details regarding the calculation of the simulated marginal tax rate refer to Graham (1996a). Graham’s sample file, in which he provides proxies for the corporate marginal tax rate for after-interest and pre-interest income for over 10,000 firms from 1980 – present, can be ordered online via: http://faculty.fuqua.duke.edu/~jgraham/taxform.html

Please refer to Graham and Lemmon (1998), pp. 56 for a more detailed description of the aspects included into the simulation.

On page 65 of their study of the measurement of corporate tax rates, Graham and Lemmon (1998) reference several other papers that use simulated tax rates to analyze incentives for firms provided by the tax code.

The remaining two determinants of Graham’s discount rate do not have to be considered. Tax credits are independent from tax benefits and the level of financing and investment related tax shields is a determinant of taxable income.

A filing with a federal bankruptcy court for bankruptcy protection under Chapter 7 results in a cessation of operations for the business. The firm sells all its assets and distributes the proceeds to its creditors. In case of a Chapter 11 filing the firm tries to stay in business. While the court is overseeing the corresponding reorganization, it can authorize complete or partial relief from the firm’s debt obligations.

The Federal Judiciary’s Web site http://www.uscourts.gov/bnkptystats/statistics.htm provides comprehensive information about the number of Chapter 7 and Chapter 11 filings and reorganizations.

Indeed a positive correlation has to be assumed. The higher the volatility of corporate profits the higher both uncertainties become. Admittedly, the profitability volatility is not the only driver for default risk and the uncertainty of usability; however it is certainly an important driver for both risks.

See Copeland et al. (2000), p. 212. Ross et al. (2005) comment on page 246 on the relation between the investment horizon and the appropriate rate of the risk-free investment. They propose the U.S. Treasury Bond rate either for the 90-day period or for a 10-year period as reference for the risk-free investment, depending on the analyst’s viewpoint. For our purpose of valuing the benefits of asset step-ups, the medium to long term view seems more appropriate.

Estimates for market leverage are taken from Liu (2005), Table 2. Liu calculates leverage ratios from 1980 to 1999 for all firms that appear on the Compustat database and whose IPO date could be identified.

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Executive Summary

The health of the financial system is a sign of economic growth and a key indicator for investors. As a consequence, one of the main purposes for policymakers is to guarantee its stability and to shield it from foreign disturbances. Both financial and economic activities are susceptible to crises. As soon as a financial crisis happens, a country may face a default risk, which can be measured in the long term through the country’s debt risk rating. Even though, with the recent crisis, the ability of ratings to predict a weak debtor has been questioned, in this paper we propose that the survival analysis methodology should be used to analyze falling rating duration. It has usually been used in labor economics and with few exceptions in financial economics. Additionally we test the capability of macroeconomic variables to predict that event in 78 countries between 1995 and 2001. From the analysis, important differences between developed and emerging economies are indicated in exchange rate risk and economic indebtedness.

Introduction

As globalization grows, financial system stability is a key signal to investors and a bad behavior of the system will not contribute to economic growth. An indicator of the domestic capital market’s health is the credit rating given to the Long Term Debt, which gives information of short term macroeconomic stability and long term payment capability.

This paper presents an effort to analyze financial crises through sovereign risk ratings. Our analysis presents two important aspects of downgrading which have not been considered before; they are the timing of the crisis and the impact of neighboring countries in crisis. In order to approach these points, we propose the use of a survival model to compute the risk function of a downgrading, controlling by macroeconomics and exchange monthly variables which reflect the economy’s health at a short and mid term. We exclude from the analysis real sector variables, as they may be endogenous to the country’s risk rating.

This methodology also allows forecasting crisis length and contagion by geographic and

We thank José Eduardo Gomez, Jeffrey Wilson, Constanza Martinez, Carlos Castro, Agustín Vélez and Laurence Mauer for their useful comments. We also thank all participants at the Financial Services Institute Symposium at St. John’s University and the LAMES 2008 meeting. Nonetheless, all errors remain ours.
economic regions. We use a semi parametric methodology, which is better suited to the analysis of non-monotonic risk functions, given the persistence and the contagion effects.

Related Literature

As financial crisis are not new, we present literature that follows these events chronologically, as well as key indicators. The First Generation Models explain crises in the early 1980s, which were characterized by the macroeconomic imbalances. Krugman (1979, p. 318) uses a simple model to show how attempts to defend a fixed exchange rate can collapse in the face of a speculative attack. He shows how the persistent balance of payments' deficits can create a run on the authorities' stock of international reserves and destroy the country's capacity to defend its exchange rate by limiting its ability to intervene in the foreign-exchange market. The central purpose of the models of this generation is to demonstrate how an attack and collapse of the exchange rate can occur before reserves have gotten exhausted and can also speed up the timing of the crisis. The end result is that the government uses up its reserves and cannot replenish them by borrowing abroad. The leading indicators of this generation are budget deficits, excessive rates of growth of money supply, dwindling reserves, excessive inflation, real exchange rate overvaluation and high interest rates.

With the crisis of early 1990s, the theory above was questioned, since not all the countries that succumbed displayed large fiscal and current account deficits. It is even more questionable considering that capital controls were lifted and international markets got wider and perhaps deeper. Obstfeld (1997, p. 68) and Ozkan and Sutherland (1998, p. 345) added the assumption that governments tend to balance the costs and benefits of defending the currency, through tight monetary policies and high interest rates.

Under these assumptions, authorities enhance their commitment to defend the currency and to maintain price stability, but the impact of high interest rates on the economy and the financial system is high.

Although there are no restrictions to capital, in these Second Generation Models the level of reserves and the ability to get money abroad play no role in empirical tests. The main issue here is the capacity of interest rates to defend currency and therefore its impact on depressing demand, the default of bank borrowers and the growth of short-term debt. The decision to defend the currency arose from an economic and political self-interest.

**Developed countries have a lower probability of failing.**

Thus, in Second-Generation Models, the crisis depends on unmeasured conditions such as the strength of the banking system, or labor market flexibility, or the prospects of economic growth and domestic political support to the government and its policies. In fact, Calvo and Reinhart (1996, p. 11) prove that contagion mechanisms are related to fixed exchange rates and high interest rates.

Finally, the main differences between First and Second Generation models are that in the latter, speculative attacks can precipitate a devaluation that would not have occurred otherwise; and that capital controls can twist the balance between the collapse of the currency peg and its maintenance forever.

The Third Generation Models of financial crises literature, called *crony capitalism and implicit guarantees*, claim that economic growth might be negative if the country faces a weak financial system in a maturation process, due to moral hazard and incentive problems (Eichengreen, 1999, p. 138). Basically it is described as a moral hazard problem.
in which owners of banks and industrial conglomerates on one side and political leaders on the other, develop ties of mutual dependence which makes governments loath to let banks fail (Dooley, 2000, p. 258 – 261; Krugman, 1998 quoted in Eichengreen, 1999, p. 139). Once the capital account of the balance of payments was opened, the implicit guarantees provided by government to banks was a lure to foreign investors; and with governments guaranteeing banks against failure, the specter of losses was removed. Therefore foreign capital flooded the economy and banking system. McKinnon and Pill (1997, p. 193) argue that once this happened, foreign borrowing was so excessive and funds were so poorly allocated that capital inflows may have reduced the growth rates of the countries involved. As the authorities leapt to the rescue of the banking system, pumping in additional domestic credit, they were forced to disregard the constraints on liquidity needed to peg the exchange rate.

As the above literature is concerned with agency problems, default risk becomes a central topic. Default or credit risk is the event in which the issuer of a fixed income security is unable to make timely principal and interest payments. The risk is gauged by quality risk ratings of commercial companies and investors who are more concerned with the changes of credit risk perceived through risk ratings than with the actual event of default (Vine, 1997, p. 476). Therefore a rating assesses the probability that the borrower will default on its bonds before the maturity date (Gaillard, 2006, p. 4). Even acknowledging that default is an unlikely event, changes in credit risk immediately affect the value of a security. As default is an improbable event, a country’s default is less plausible if we define it through sovereign risk. Sovereign risk is the probability of default and pricing volatility as a consequence of the financial influence of a foreign country (Vine, 1997, p. 477).

In addition, sovereign risk analysis may be defined based on its components: willingness and ability to pay (Exhibit 1).

Willingness to pay is neither an easy point to check nor to predict, as it depends on political bargaining, which deal with the trade-off between costs of payment and costs of repudiation (Eaton and Gersovitz, 1981, p. 290; Bollow and Rogoff, 1989, p. 46). On the other hand, ability to pay is easier to measure and is therefore more predictable. Vine (op. cit) proposes a set of aspects to analyze ability to pay (Exhibit 1). The scheme is similar to the profile presented by rating companies in their methodologies. In fact, both Moody’s and S&P’s sovereign ratings methodology analyses five basic aspects: political dynamics, economic structure, government structure, financial performance and debt profile. (Table 3, in the Appendix, presents the specific topics employed by each agency).

Financial risk depends on exchange and credit risk, on real sector stability and on the indebtedness of the economy.

Both Vine (1997) and commercial rating companies highlight that for sovereign risk analysis, one should test liquidity, solvency, macroeconomic fundamentals and external shocks. In order to assess missing ratings for a set of countries, Hu et al (2002, 1387) use a set of variables for each category. Haque et al (1998, p. 4) and Bissoondoyal-Bheenick (2005, p. 253) found that the key determinants of ratings are macroeconomic variables; meanwhile political variables have a marginal effect. Nonetheless, many repressors have been tested by agencies. The problem is that they do not work as predictors of crises (Reinhart, 2002, p. 20).
Survival Analysis

Survival models are not only focused on the occurrence of the event, but also on the impact of predictable variables (constant or varying through time) on the chance of governmental change. These elements may be summarized as: censoring, continuous or discrete treatment, ties and multiple causes of ending (competing risk).

Duration variable must be a nonegative random variable, represented by a density function $f(t)$ and by a cumulative distribution function $F(t) = P(T \leq t)$. The first function is related to the duration of the event and the second is related to the maximum duration.

Based on the above functions, we construct survival and hazard functions. The first function captures the probability that an individual lasts more than a specific time, which may be assessed by the survival function $S(t) = 1 - F(t) = P(T \geq t)$. The risk or hazard function represents the instant probability of change; it means the duration between the active stage and its ending. This may be represented as

$$h(t) = \lim_{\Delta t \to 0} P(t \leq T < t + \Delta t | T \geq t) = \frac{f(t|T \geq t)}{S(t)}.$$ 

The purpose of survival models is to assess $S(t)$ and $h(t)$ based on the observed individual characteristics. To obtain $S(t)$, we follow Kaplan and Meier (1958), which is based on the nonparametric estimators of product limit, the most efficient estimator. The Kaplan-Meier estimator is given by:

$$\hat{S}(t) = \begin{cases} \frac{1}{y_i} & \text{if } t < t_i \\ \prod_{t_i \leq t} \left(1 - \frac{d_i}{y_i}\right) & \text{if } t \geq t_i \end{cases}$$

where $t$ is the period in which the first change occurs, $y_i$ is the sum of individuals who may change of state at moment $t_i$ and $d_i$ is the number of individuals who change at moment $t_i$. Based on the survival function, one may get the cumulative hazard function $\Lambda(t)$ meaning the cumulative risk at specific moment; this is known as the Nelson-Aalen estimator, which accomplishes with the Kaplan-Meier's estimator properties.
With \( \hat{\Lambda}(t) \), one gets the instant probability of change; this is a raw nonparametric estimator of the hazard function; given by: \( \Delta \hat{\Lambda}(t) = \hat{\Lambda}(t) - \hat{\Lambda}(t-1) \). An estimation of the smooth hazard function may be made by a kernel approximation of \( \Delta \hat{\Lambda}(t) \). The hazard function may be estimated by using either parametric or semiparametric methods. In this case, we used semiparametric estimators, assuming that the relation between survival and probability may be nonmonotonic, which is an advantage, not only because it is more general but also because estimators are more efficient.

Our specification follows Cox (1972); who assumes that hazard function has a multiplicative form: \( h(t|x) = h_0(t)e^{\beta x} \)

where \( h_0(t) \) is the common risk function or baseline and \( e^{\beta x} \) is the function which points out individual characteristics’ affect on the probability of change.

**Data and Nonparametric Estimation**

We analyzed information of 78 countries between 1995 and 2001. Because of the asymptotic properties of the models, the frequency of independent variables is monthly. The sample is representative among countries with relative developed capital markets. Ratings are classified by region and by income level (Exhibit 2):

The monetary authority must commit itself to using reliable measures...to conserve the stability of the financial system by monetary emission or the accumulation of reserves.

**Exhibit 2. Number of countries by region and income level classification**

The variable we used to assess country risk is the rating given by the Moody’s agency to long term bonds in foreign currency. The ratings go down from Aaa to C, with numeric variations from one to three and + or – signs if the changes were minimal. Downgrading is set according to the following criteria given by Moody’s (2007).

In the analysis, we defined every downgrading as a default. In the analyzed period there were 72 downgradings. The region with the most failures is Pacific Asia, followed by America and Europe. As a contrast to other risk indicators, country risk rating from the agency Moody’s not only takes into account economic variables in a pure sense, but also considers long term issues. By doing this we avoid subjective definitions of crisis (Domaç and Martinez, 2000, p 49; Gourinchas et al., 2001, p. 5) and we use the above mentioned ratings’ characteristics.

There are countries with repeated events of downgrading. It is convenient to verify the average number of failures, which in turn may be used to bear out intense and persistent long term debt. Failure distributions are accumulated between 1998 and 1999, with the highest number of nine downgradings...
in September of 1998 and six failures in July. Around these dates there is an accumulation of defaults, which means that there may be a persistence effect (or a contagion one). On the other side, there were no dramatic changes until 1997 but there was an outlier in 2001. These results and the failure cumulative function are in Exhibit 3.

**Exhibit 3.**
Downgrading distribution over time

*(a) Failures distribution*

[Graph showing failures distribution over time]

*(b) Cumulative failures*

[Graph showing cumulative failures over time]

As shown in the previous section, survival analysis requires both survival and risk function estimations. Therefore, a Kaplan-Meier survival function and a smooth hazard function were estimated through the Kernel Epanechnikov distribution function: for the group of 78 countries (Exhibit 4), for high income level countries (Exhibit 5) and for the countries grouped by region (Exhibit 6).

**Risk rating presents two survival critic zones.** During the first 18 periods, more than 30 percent of all countries fall. The phenomenon is explained by multiple failures and not by the crisis observed in the first years of the sample. As it was explained earlier, most of the failures were in 1998 and less than 10 failures were before January of 1997. Once a country overlaps the first zone, it faces high risk levels between period 30 and 50, which is shown in the 1998 financial crisis. In this crisis, we can see that the problem stems directly from the default probabilities growth in period 45 and, indirectly (by considering
the replies), in the high probabilities between periods five and fifteen. An interesting regularity is that the risk function is not monotonic, which suggests that the survival model must consider semiparametric structures. This is a result of the contagion effect between 1998 and 1999, which earlier and later reduces the risk of changing rating.

**Exhibit 5. Risk rating survival analysis in 78 countries, by OECD classification**

(a) Survival function

(b) Risk function

Once OECD countries are analyzed, it is found that developed countries have a lower probability of failing. Even more, apparently the 1998 crisis did not cause a huge direct effect on the instantaneous probability of reducing risk rating, because most falls occurred before 20 periods. This is explained by six falls in Japan (40 percent of falls in the group of countries). Although defaults occurred close to 1998 crisis, not all of them were in risk function around period 40, because those were replies.

Analyzing by regions, Europe, as a group, has the lowest probability of failing, followed by America and Asia-Oceania, which has important differences in time probability, being the first region prone to this phenomenon in the first periods. The probability of failure is greater around period 40, which suggests that in this region 1998 crisis played a key role. America’s risk function suggests that there was persistence in some falls, as in Argentina (eight falls), Colombia (four falls), Ecuador and Venezuela (three falls each). When failure probabilities were estimated, these replies were as important as the direct effect of the crisis.

**Exhibit 6. Risk rating survival analysis in 78 countries, by region**

(a) Survival function
Results

Considering survival and risk functions, we use parametric and semiparametric methods to explain the determinants of downgrading. In the former, we use weibull, gompertz and exponentiall functions (these models may present bias problems; nevertheless the estimation is based on two points to have a reference to compare the Cox model and because the risk function is not monotonic).

Empirical regularities suggest that financial risk depends on exchange and credit risk, on real sector stability and on the indebtedness of the economy. The analysis considered five explanatory variables and one to capture contagion financial risk:

- **Percentage of the quota of IFM loan**: captures the degree of indebtedness.
- **Exchange regime**: represents the level of rigidity of the exchange system by a scale: (1) floating, (2) intermediate and (3) fixed regime. An economy with a floating regime is more exposed to changes of foreign markets and therefore accelerates a contagion effect. Nevertheless, under a fixed regime the monetary authority must commit itself to using reliable measures, with the purpose of conserving the stability of the financial system by monetary emission or the accumulation of reserves.
- **OECD participation**: dummy variable, one for a country member. The variable captures risk differences between developed and emerging economies.
- **Variance of international reserves**: measured as the standard deviation of international reserves with a window of one year earlier and later of the consolidated observation.
- **Reserves’ growth rate**: annual growth of international reserves. The intuition behind the variable is tied to the payment capacity of the economy.
- **Crises accumulation**: the variable accumulates the number of crises by region in time, aiming to verify if the probability of the rating change of a specific country has an inertial effect on the rating change in the closest country(ies). However, one should notice that the transmission mechanism may be due to trading relations among countries, which in turn are larger among nearby countries.

The default probability of a country increases 3.2 pp when its neighbors are downgraded.

In order to capture any nonlinear effect of this variable, we use a second degree polynom. To avoid correlation between a variable and its square, we use an orthogonal polynom generated by the crisis accumulation variable of each region.

Then, the model is specified by:

\[
h(t|\mathbf{x}_i) = h_0(t) \exp(\mathbf{x}_i' \mathbf{\beta})
\]

\[
\mathbf{x}_i' \mathbf{\beta} = \beta_1 q + \beta_2 er + \beta_3 OECD + \beta_4 ser + \beta_5 rg
\]

Results (Table 1) include proportional risk and parametric models; the latter is a reference point. The diagnostic is focused exclusively on the Cox proportional risk model. In order to test contagion effect, we estimate a model with crises accumulation variable and without high income variable, since the latter presents...

Table 1. Parametric and semiparametric survival models results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Cox(1)</th>
<th>Cox(2)</th>
<th>Cox(3)</th>
<th>Cox(4)</th>
<th>Weibull</th>
<th>Gompertz</th>
<th>Exponential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent Quota</td>
<td>0.0013</td>
<td>0.0011</td>
<td>0.0011</td>
<td>0.0012</td>
<td>0.0016</td>
<td>0.0014</td>
<td>0.0018</td>
</tr>
<tr>
<td></td>
<td>(0.0006)</td>
<td>(0.0005)</td>
<td>(0.0006)</td>
<td>(0.0006)</td>
<td>(0.0006)</td>
<td>(0.0006)</td>
<td>(0.0006)</td>
</tr>
<tr>
<td>Exchange regime</td>
<td>-0.2931</td>
<td>-0.3474</td>
<td>-0.3388</td>
<td>-0.3107</td>
<td>-0.3013</td>
<td>-0.2637</td>
<td>-0.3294</td>
</tr>
<tr>
<td></td>
<td>(0.1574)</td>
<td>(0.1553)</td>
<td>(0.1551)</td>
<td>(0.1578)</td>
<td>(0.1533)</td>
<td>(0.1552)</td>
<td>(0.1512)</td>
</tr>
<tr>
<td>High income countries</td>
<td>-0.8751</td>
<td>-0.8451</td>
<td>-1.0346</td>
<td>-0.9165</td>
<td>-1.0990</td>
<td>-0.9165</td>
<td>-1.0990</td>
</tr>
<tr>
<td></td>
<td>(0.3379)</td>
<td>(0.3499)</td>
<td>(0.3366)</td>
<td>(0.3377)</td>
<td>(0.3288)</td>
<td>(0.3377)</td>
<td>(0.3288)</td>
</tr>
<tr>
<td>Crisis accumulation</td>
<td>0.0320</td>
<td>1.6126</td>
<td>0.7160</td>
<td>-1.0346</td>
<td>-0.9165</td>
<td>-1.0990</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0151)</td>
<td>(1.4201)</td>
<td>(1.4627)</td>
<td>(0.3336)</td>
<td>(0.3377)</td>
<td>(0.3288)</td>
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<tr>
<td>Crisis accumulation</td>
<td>-2.1936</td>
<td>-2.0769</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(second degree)</td>
<td>(1.0560)</td>
<td>(1.0544)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.E(Reserves)</td>
<td>0.0001</td>
<td>0.0001</td>
<td>0.0001</td>
<td>0.0001</td>
<td>0.0001</td>
<td>0.0001</td>
<td>0.0001</td>
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<tr>
<td></td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>Reserves growth</td>
<td>-2.1698</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.4901)</td>
<td>(0.4888)</td>
<td>(0.4990)</td>
<td>(0.5083)</td>
<td>(0.4761)</td>
<td>(0.4617)</td>
<td>(0.4623)</td>
</tr>
<tr>
<td>Constant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-3.1800</td>
<td>-3.2985</td>
<td>-3.6229</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.4343)</td>
<td>(0.3357)</td>
<td>(0.3111)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Standard errors in parentheses

Table 2. Survival function test between high and low income countries

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Log Rank</th>
<th>Wilcoxon</th>
<th>Cox</th>
</tr>
</thead>
<tbody>
<tr>
<td>$C_2^1$</td>
<td>4.63</td>
<td>3.66</td>
<td>4.87</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0315</td>
<td>0.0557</td>
<td>0.0274</td>
</tr>
</tbody>
</table>

This result allows us to do a risk analysis for every group. Although the size of the high income group is very small, it is possible to think that the coefficient of the variable is a good approach to distinctive probabilities. On the contrary, the instability of international reserves presents an increase in the probability of falling of 8.6 pp for every thousand units and diminishes the probability of the growth rate by 88.5 pp.

In the model with crisis accumulation variable (Cox(2) column), the coefficients of the variables do not change dramatically. According to what we expected, the accumulation variable has a positive effect,

a regional correlation; the inclusion of both variables give similar information. By the Cox column in Table 2, the model is robust on the change of regional correlation measure and contagion proxy.

The variable percentage of quota implies that one percent of debt increases the probability of rating reduction 0.13 percentage points (pp); the exchange regime exercise suggests that a more rigid exchange rate diminishes this probability in 29.3 pp.

High income variable proves that those countries with better economic development have a probability of 58.31 pp lower than less developed and emergent countries. Considering this important difference, it is possible to think that survival functions of high income countries are different from the others; this observation is supported by log rank and wilcoxon test (Table 2).
meaning that the default probability of a country increases 3.2 pp when its neighbors are downgraded.

As it is seen in the distribution function of contagion variable (Exhibit 3), one may think it has a nonlinear effect. In order to capture this effect and to avoid the multicollinearity raised from the inclusion of variables of higher degree, we include an orthogonal polynom of second degree. Contagion variable has concave form; this suggests that the effect of the variable on the probability of falling is higher on lower levels of crises accumulation. The observation may be supported on Gourinchas et al. (2001, p.13) meaning there is a strong correlation between contagion and risk in the short term, but it is neutralized in the mid term.

By including the orthogonal polynom we isolate contagion from the high income effect, as these two variables seemed highly correlated. In the model which includes both variables (column Cox(4)), the contagion variable has positive but decreasing effect. In addition it reduces the probability of downgrading in high income countries.

The higher the GDP of a country, the lower its probability of downgrading.

In survival, risk and cumulative risk functions it is shown that the model demonstrates the regularities observed in the graphic analysis of the previous section: financial default persistence, which may be seen in instances of downgrading or region contagion effects.

To verify forecast model quality, survival function for high and low income countries was estimated, both the semiparametric and the one obtained from the Cox model (see Exhibit 7). By these estimations it is seen that the model presents a good fit.

Exhibit 7. Observed and forecasted (Cox model) survival models by income level

Concluding Remarks

A country's long term debt risk rating is a key signal for the health of the financial system. Thus it is a signal to investors, too. If there is a downgrading, it is due to a poor economic performance which may accelerate a crisis. As previous work has found, this paper too found that ratings are explained by both monetary and exchange variables. Therefore, if the purpose is to keep the risk indicator stable, then policy makers may use those mechanisms of transmission. The intuition behind this point is as follows: if there is a close relationship between macroeconomic variables and financial stability, this must be captured in ratings. Therefore short term financial variables would explain such transitions. Although using survival analysis we found evidence of this fact, it is not clear the role of credit rating agencies in the analysis of debt instruments, considering the crisis of 2007 and 2008.

The literature has studied the impact of real, financial and political variables on risk ratings and the results have shown that the second group has the greatest impact. Meanwhile, political variables have just a limited impact (Haque et al., 1998, p. 4). On the other hand, as real variables are potentially endogenous with the rating, it is not possible to establish a clear causality.
Because of the space-temporal characteristic of survival models, it is feasible to combine idiosyncratic country effects and time effects, which in turn are tied to financial contagion. Therefore, in the studied period (1995 – 2001) which was characterized by a great financial instability, based on survival analysis we conclude that an excessive indebtedness with the International Monetary Fund, exchange rigidities and the instability of international reserves have a remarkably negative effect on risk ratings. On the other hand, by looking at the results between high and low income countries and among regions, we found that the higher the GDP of a country, the lower its probability of downgrading. This event is highly correlated with contagion effects by region, which in turn has an important positive effect within the model.

This paper offers empirical evidence of the importance of debt instruments — particularly monetary and financial — in countries, with a methodology to test the persistence of credit risk rating agencies, which must include additional instruments to test the financial health of a country.

References


**Appendix**

**Table 3. Sovereign rating methodology profile by rating agency**

<table>
<thead>
<tr>
<th>Topic</th>
<th>S&amp;P</th>
<th>Moody’s</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Political dynamics</strong></td>
<td>Political risk</td>
<td></td>
</tr>
<tr>
<td><strong>Economic structure</strong></td>
<td>Income and economic structure</td>
<td>Economic structure and performance</td>
</tr>
<tr>
<td></td>
<td>Economic growth prospects</td>
<td></td>
</tr>
<tr>
<td><strong>Government structure</strong></td>
<td>Fiscal flexibility</td>
<td>Government finance</td>
</tr>
<tr>
<td></td>
<td>General government debt burden</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Offshore and contingent liabilities</td>
<td></td>
</tr>
<tr>
<td><strong>Financial performance</strong></td>
<td>Monetary stability</td>
<td>Monetary, external vulnerability and liquidity indicators</td>
</tr>
<tr>
<td></td>
<td>External liquidity</td>
<td></td>
</tr>
<tr>
<td><strong>Debt profile</strong></td>
<td>Public-sector external debt burden</td>
<td>External payments and debt</td>
</tr>
</tbody>
</table>

Source: Authors’ classification based on Gaillard (2006, p. 25 – 28)
Endnotes

1 Krugman (1979, p.319 – 322) assumed that payments imbalances and the currency crisis resulted from the tendency of governments to use expansionary monetary and fiscal policies.

2 In order to assess missing ratings for a set of countries, Hu et al (2002) use a set of variables for each category.

3 The inclusion of changing variables may cause simultaneity or autocorrelation.

4 The period 1995 to 2001 covers the “Asian crisis,” which affected the economic conditions in many countries.

5 Income level classification is based on OECD definition.

6 Data is from International Financial Statistics from IMF (2007), except for exchange rate regime, which comes from Reinhart and Rogoff (2002). No colinearity among variables was verified and it is available by request.

7 Variables as debt and its possible variations as percentage of GDP were not included as the information is not available for several countries.

8 This variable was also specified as a dummy variable. The result does not change and shows differences between floating exchange rate and to other two regimes.

9 Given our definition of default.

10 Indeed after period 45, there is a strong acceleration in crises.

11 The square of the variable presented multicolineality problems. Splines based on time and crises accumulation were not significant; the same result was obtained for orthogonal polynoms of third degree.

12 Not shown but available by request.
Fashion Accessory Buying Intentions Among Female Millennials

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Executive Summary

There is a growing trend for shoppers to customize a large purchase by combining several related off-the-shelf products. This study researched one segment of this retail trend, the in-store customization of off-the-shelf fashion accessories by young women, to analyze selected factors that may affect purchase behavior motivation and to build a profile of do-it-yourself young female consumers. A survey covering selected attitudes, behaviors and demographics was created and pilot-tested. The main study comprised female millennials (young women born between 1982 and 2001) frequenting the huge Mall of America shopping complex in Minneapolis. The Theory of Reasoned Action provided the foundation for the survey’s development, as well as for follow-up analysis. Significance testing yielded strong support for both the theory base and the inter-relationships among most main behavioral factors. Analysis suggested a potential customer profile, specifically a sociable, fun-seeking shopper with a solid need for creative expressions.

The research suggests that the create-your-own product market may be extended to clothing accessories, beginning with handbags. Young female shoppers afford tremendous opportunity for this product category and practitioners are advised to choose locations and communication strategies to best reach them.

Background

Customizing consumer products has existed for many decades. However, little has been researched or written regarding motivational factors that may affect consumers’ attitudes and intentions to self-create off-the-shelf products or about the creation of a customer profile for segmentation and promotion purposes.

In recent years, the marketplace has seen the rise of a new group of retailers focusing on self-customizing off-the-shelf consumer products. Until the Build-a-Bear chain offering stuffed bear creation was opened, neither bricks-and-mortar retailers nor e-tailers focused on affording their customers an opportunity to personalize a product by hands-on participation. This chain, typically located in busy shopping malls in large metropolitan shopping areas, allows customers to choose from a diversified offering of clothing and accessories to create the bear of their choice. Enjoying great success, the franchise has 346 stores in the United States, Europe, Asia, Africa and Australia (Business Wire, 2009). This store is but one example of a possible trend...
addressing the needs of the do-it-yourself consumer.

The objective of this study is to examine how attitudes and beliefs may affect buying intentions and how these intentions may influence the growing appeal of do-it-yourself fashion accessory purchases among female millennials in the United States. Millennial age range is defined as children born between 1982 and 2001 (Howe and Straus, 2000, p. 4). Millennial consumer power is approximately $1 trillion per year and this group exerts great influence over many adult consumer buying choices (U.S. Census Bureau, 2006). Millennials think of themselves as special and tend to favor distinctive products, such as individualized music players and personalized ring tones (Howe and Strauss, 2000, p. 20). In a similar vein, the current research examines their willingness to use fashion accessories as a means of self-expression.

The Theory of Reasoned Action (Ajzen and Fishbein 1980, p. 19) provides a suitable theoretical framework for conceptualizing such behavior. The Theory of Reasoned Action (TRA) is used in this study because of its ability to predict behavior based on a limited number of interrelated cognitive, conative and affective factors.

Conceptual Framework

Our guiding research premise is that creating one’s own product is rational, systematic and thoughtful behavior rather than capricious or habitual. This research examines the relationship between the intent to perform a specific behavior, i.e., customizing one’s own handbag and consumer segments that would be willing to perform the behavior.

Models of consumer behavior include the Engel, Blackwell and Miniard model (Schiffman and Kanuk, 1994) which attempts to explain the process of an individual’s spending behavior at a macro level, along with his or her lifestyle. The Tri-Component and Multi-Attribute Theories of Consumer Behavior incorporate spending situations that include perceived risk, the individual’s predisposition toward performing the action and the belief as to what the individual perceives that her referents, e.g., friends, family or colleagues, think about the intended action. The first model is difficult to put into operation in its entirety, while the last two models evolved into the Theory of Reasoned Action.

Female millennials [young women born between 1982 and 2001] think of themselves as special and tend to favor distinctive products, such as individualized music players and personalized ring tones.

TRA as employed in this study (Ajzen and Fishbein, 1980, p. 84) has a long documented history and support; hence a detailed explanation of the theory will not be included. Sheppard et al. (1988) conducted a meta-analysis of 174 TRA-based studies, the focus of which was to assess empirical studies that exceeded TRA’s parameters. Modifications to TRA have been made over the ensuing years; a major one eliminated the relative importance of the behavior in favor of perceived behavioral control (Ajzen, 1991, pp. 179 – 211).

Two factors govern intended behavior: (1) the individual’s attitude toward performing the behavior (attitudinal factor) and (2) the social pressures put on her to perform or not perform the behavior in question (normative factor). For example, one may have a positive attitude toward voting for a political candidate, yet social pressure may alter one’s voting choice and/or the actual act of voting altogether. To predict a consumer’s purchase behavior, the relative importance of both the attitudinal and normative factors as determinants of intentions must be defined.
Additionally, a social norm component incorporates an individual's belief that a relevant reference group (e.g., friends or parents) thinks the person should or should not perform the behavior and the individual's motivation to comply with the reference group (Yoh, et al., 2003). TRA posits that a person's attitude toward a particular behavior is a function of two a priori factors, namely one's beliefs that performing the behavior leads to various outcomes and evaluations of those outcomes. Returning to the voting example, one would recognize potential outcomes of voting and also rate each of the potential outcomes of both the general and specific behaviors.

According to Teich (2001, p. 39), TRA's strength lies in its ability to demonstrate how particular internal and external factors interact, which in turn explains why people will or will not perform the general behavior. He also cites multiple empirical studies showing TRA's ability to accurately predict behavior in diverse situations (Teich 2001, pp. 45 – 46).

Baker et al. (1996) held that TRA suggests an individual's intention to perform a specific behavior is a linear function of one's affective response to performing the behavior (attitudes) and perceived social norms about the behavior. Attitudes are, in turn, predicted by the individual's beliefs about the likelihood and evaluation of the consequences of performing the behavior (outcome beliefs). Perceived social norms are based on the individual's beliefs about the wishes of relevant specific referents and his or her desire to conform to those norms (normative beliefs). All other variables are assumed to influence intention and hence future behavior, through attitude and social norm (Baker et al., 1996, p. 531).

A measure of consumer intention is not always a good predictor of behavior (Teich, 2001, pp. 39 – 41). Intentions can change over time. Further, a measure of intention taken some time before observing the behavior may differ from the intention at the time the behavior is observed. For instance, a behavioral intent continuum exists starting as a latent intention to get married. That intention increases as one dates, then gets engaged makes wedding plans, walks down the aisle and is actually pronounced married. One merely has an intention to perform the behavior to a lesser or stronger degree. Fishbein and Ajzen state that the closer in time one is to performing a behavior, the stronger is the predictive accuracy of the intention to perform the behavior, thereby strengthening the link between the two (Ajzen and Fishbein 1980, p. 34). While it is true specific experiences may cause consumers to change their intentions over time, our focus is on forecasting behavioral trends in key segments of the market. Our specific interest is in that market segment likely to custom-adorn its own handbag.

Thus, Ajzen and Fishbein (1980, p. 50) suggest the intention-behavior relation will tend to be strong in the absence of unexpected events but weak in their presence. However, if the intention is measured after the extraneous events have occurred or if these events are taken into account, a strong intention-behavior relation will exist.

Theoretical Model

Exhibit 1 provides the theoretical framework for TRA. The model consists of a series of hypotheses linking belief to behavior, with each hypothesis requiring empirical verification.

According to Ajzen and Fishbein (1980, p. 85), the dotted-lined arrows indicate external indirect linkages, which are not expected to have consistent effects, while the solid-lined arrows indicate direct internal linkages among the variables and are always assumed to hold, so long as appropriate measures are obtained.
Based on review of the existing literature and the TRA model, the following hypotheses were proposed and tested:

H1: There will be a positive linkage between the respondents’ intention to customize a fashion accessory and their general attitude toward the behavior. [Attitude toward the Behavior (AB) to Behavioral Intentions (BI)].

H2: The relative importance to the respondents of customizing a fashion accessory, in combination with their general attitude toward shopping, will have a positive influence on their intention to customize a fashion accessory. [Relative Importance of the Behavior (RB) to AB to BI].

H3: The relative importance to the respondents of customizing a fashion accessory, in combination with their subjective norm, will have a positive influence on their intention to customize a fashion accessory. [RB to Subjective Norm (SN) to BI].

H4: There will be a positive relationship between the research participants’ subjective norm and their intention to customize a fashion accessory (SN to BI).
Methodology

A pilot study was conducted at Roosevelt Field, a large regional shopping mall located in Westbury, Long Island, New York. Questionnaires were administered to female millennials. A significant number of respondents (more than 85 percent) were favorably inclined to patronize and spend time in a store offering them the opportunity to create their own handbags; (e.g., choosing from a selection of designs, materials, colors, handles, straps and chains, etc.) Data such as the number of handbags owned, average handbag cost and the number and purpose of mall visits all resulted in supporting the continuance of a main study and the possibility of uncovering a trend in hands-on interactive retailing.

A main study survey instrument was created, using the traditional TRA model according to Ajzen and Fishbein’s (1980, pp. 260 – 274) guidelines to determine whether there is a significant relationship between respondent attitudes and beliefs and the intended behavior; namely, creating one’s own handbag.

A mall intercept study was conducted at the Mall of America (MOA) in Minneapolis, the largest shopping mall in the United States. Questionnaires were administered to 100 female shoppers in the following proportions: 40 percent to ages 10 – 15, 40 percent to ages 16 – 19 and 20 percent to ages 20 and over. The period involved had no holiday or special shopping event that would dramatically alter the number and/or type of respondents queried. The internal and behavioral theory components were measured using six-point agreement scales (Teich, 2001, p.75).

Results

A total of 100 main study respondents returned usable questionnaires. The data were analyzed using SPSS® version 14 to run Cronbach’s alpha, multiple regression analysis and Pearson’s correlation coefficients. The .05 level was used to accept or reject each hypothesis.

A Cronbach reliability test was conducted to determine the inter-reliability relationships among the questionnaire elements. Except for two TRA variables (Evaluation of Outcome and Motivation to Comply), the Cronbach alphas were high which, in turn, supported the reliability of those questions that related to each TRA factor. Composite values, based on their respective means, were then created for each of the remaining TRA factors, which then underwent correlation analysis and multiple regression analysis where applicable. The respective means and medians were deemed very similar to one another; therefore the means were used to create composite scores. The external factors (e.g., age) were grouped according to their respective medians and then used as controls for partial correlations when analyzing the main TRA factors. Medians were used to create grouped controlling factors because of the wide variances of the respondents’ responses, which in turn had a major impact on the respective means. For instance, in the case of age, the median breakpoint was 16.5.

Specifically, Behavioral Beliefs (yielding an alpha of .611), Subjective Norms (.743) and Attitude toward Behavior (alpha .715) generated higher alphas than did Normative Beliefs (.526). Incorporating Relative Importance of the Behavior into the model increased the alpha for the last two TRA variables (.814 and .806, respectively). These results suggest that RB had a greater impact on NB and SN than on BB or AB internal reliability relationships.

Exhibit 2 represents the partial correlations between the composite TRA factors controlled by the grouped external factors.
Exhibit 2

TRA Depicting Partial Correlations

- **BB**
  - Age = .279
  - Length = .249
  - #Casual = .251
  - #Dress = .251
  - $Casual = .279

- **AB**
  - Age = .446
  - Length = .421
  - #Casual = .440
  - #Dress = .434
  - $Casual = .431

- **EO**
  - Age = .365
  - Length = .365
  - #Casual = .368
  - #Dress = .367
  - $Casual = .361

- **RB**
  - Age = .473
  - Length = .513
  - #Casual = .497
  - #Dress = .491
  - $Casual = .470

- **NB**
  - Age = .452
  - Length = .474
  - #Casual = .479
  - #Dress = .466
  - $Casual = .444

- **SN**
  - Age = .298
  - Length = .295
  - #Casual = .335
  - #Dress = .278
  - $Casual = .283

- **MC**
  - Age = .233
  - Length = .250
  - #Casual = .263
  - #Dress = .238
  - $Casual = .128

  - Age = .534
  - Length = .550
  - #Casual = .535
  - #Dress = .550
  - $Casual = .529

  - Age = .473
  - Length = .476
  - #Casual = .476
  - #Dress = .466
  - $Casual = .466

  - Age = .473
  - Length = .476
  - #Casual = .476
  - #Dress = .466
  - $Casual = .466

  - Age = .473
  - Length = .476
  - #Casual = .476
  - #Dress = .466
  - $Casual = .466

  - Age = .473
  - Length = .476
  - #Casual = .476
  - #Dress = .466
  - $Casual = .466
Partial Pearson Correlations Controlled by:

- Grouped Age [median age = 16.5]
- Grouped Number of Mall Visits per Month [median visits / month = 3.5]
- Grouped Length of Stay in Mall per Visit [median hours / visit = 2.5]
- Grouped Number of Casual Hand Bags Owned [median number owned = 2]
- Grouped Cost of each Casual Hand Bag [median cost / bag = $20]
- Grouped Number of Dress Hand Bags [median number owned = 2]
- Grouped Cost of each Dress Hand Bag [median cost / bag = $30]

Overall Interpretation of Boxed Numbers in Exhibit 2:

All the correlations are significant at the .05 level. Regardless of the control factor used, the correlations within each box indicate a high degree of internal consistency between linked TRA variables. Because the grouped control factors are deemed external factors in the TRA model, as Ajzen and Fishbein (1980, p. 9) posited and as Teich (2001, pp. 150, 159) found in his own study, they were found to have no direct influence on behavioral or attitudinal factors in this study. Because Cronbach alphas for Expected Outcomes (EO) and Motivation to Comply (MC) were too low, correlation analyses were not performed on their respective links. Correlation analysis revealed no linear relationship between NB and SN.

Behavioral Beliefs (BB) and Normative Beliefs (NB):

Ajzen and Fishbein’s (1980, p. 84) original model showed no direct link between BB and NB. However, data from the present study indicate a linkage exists. This implies that normative beliefs may influence one's behavioral beliefs or behavioral beliefs may color one's perception of important referents. Since in this study the respondents were under 30 years of age, with half under 17, millennials may be overly affected by their perception of referent behavioral norms which, in turn, may shape their behavioral beliefs.

Behavioral Beliefs (BB) and Attitude toward the Behavior (AB):

Of all the linked Theory of Reasoned Action components, this was the weakest correlation. This may be because millennials are young and therefore may not have formed a clearly-defined linkage between behavioral belief and an attitude toward the behavior. It is also possible that the existing behavioral belief is in flux because they are in the midst of attempting to establish their own unique behavioral beliefs.

Attitude toward the Behavior (AB) and Subjective Norm (SN):

Ajzen and Fishbein’s (1980, op. cit.) original model showed no direct link between AB and SN. However, the present study indicates a linkage exists. Again, as in the previously-discussed link between BB and NB, this may mean that millennials are greatly affected by their perception of referent behavioral norms. This, in turn, may shape the respondents’ behavioral beliefs.

**TRA’s strength lies in its ability to demonstrate how particular internal and external factors interact, which in turn explains why people will or will not perform the general behavior.**

Attitude toward the Behavior (AB) and Behavioral Intentions (BI):

It appears that millennials have formed a fairly strong direct relationship between the attitude toward the behavior and their intention to perform the behavior.

- Therefore, H1 is supported: There is a positive linkage between the respondents’ intention to customize a fashion accessory...
and their general attitude toward the behavior.

*Being in a shopping mall, the respondents may exhibit favorable attitudes and beliefs toward the intention to perform a particularly stimulating buying behavior, namely creating handbags.*

**Subjective Norm (SN) to Behavioral Intentions (BI):**
The AB to BI link is approximately 50 percent stronger than is the SN to BI link. One possible interpretation is that the study respondents do not recognize that they can be influenced by specific referents on their behavioral intentions. Therefore, this group may believe that the linkage between their subjective norm and behavioral intentions is independently determined, to a greater degree than the linkage between their attitude toward the behavior and behavioral intentions. One may question why some people are reluctant to admit to being influenced by specific referents in some decision-making situations. Ajzen, 1991, stated that the SN to BI link will be weaker than the AB to BI link. Hence, the present findings are consistent with Ajzen’s prediction.

- Therefore, H4 is supported: There is a positive relationship between the research participants’ subjective norm and intention to customize a fashion accessory.

**Relative Importance of the Behavior (RB) and Behavioral Intentions (BI):**
Of the seven grouped control factors, only Visits-to-the-mall-per-Month was found not significant because the p-value exceeded the .05 level (p-value was .055). Therefore, this link had six components instead of seven and proved to be the weakest linked relationship. TRA posited no direct relationship between RB and BI and the present results tend to bear that out.

**Relative Importance of the Behavior (RB) and Attitude toward the Behavior (AB):**
RB is directly linked to AB, indicating that these millennials feel that the relative importance of customizing fashion accessories and their attitude toward the behavior are positive. This link is more than 11 percent stronger than is the SN to AB link. This finding is consistent with other studies results, wherein AB has a greater influence than SN (Ajzen 1991).

**Relative Importance of the Behavior (RB) and Subjective Norm (SN):**
A stronger link was discovered between RB and SN than between RB and AB. An interpretation of this finding could be found in the weak correlation of the SN to BI relationship as well as in the SN antecedent factors. This is consistent with the SN to BI finding where the millennials do not recognize potential or actual influence of referents on their behavior.

**RB and AB to BI; RB and SN to BI:**
Using multiple regression analysis to measure the influence of RB on AB to BI and RB on SN to BI revealed significances within the stated .05 limit. The respective “R” factors were .447 and .301.

- Therefore, H2 is supported: The respondents’ relative importance of customizing a fashion accessory in combination with their general attitude toward shopping has a positive influence on intention to customize a fashion accessory, is supported.
- Therefore, H3 is supported: The respondents’ relative importance of
customizing a fashion accessory in combination with their subjective norm has a positive influence on intention to customize a fashion accessory, is supported.

In this study, TRA was generally supported in most of its posited relationships. Two unanticipated links were discovered (BB-NB and AB-SN), while three links were not supported (EO to AB; NB to SN; and MC to SN). The newly-discovered links could be based on the overall young age of the respondents, while the lack of internal reliability of the three envisioned links could be because of the nature of the questions posed.

The external variables, when linked to the other variables, weakened the inter-relational linkages. These findings suggest that external variables have only an indirect impact on the balance of the TRA model, consistent with Ajzen and Fishbein's original parameters as well as with findings from other studies (Shepard, et al., 1988). When additional variables were added in a lock-step manner, save for the external variables, the alphas tended to increase, thereby supporting the overall model. Based on the above findings, this group of millennials is generally receptive to the idea of customizing handbags.

Discussion and Implications

The research offers evidence TRA can be successfully applied to a business research domain and suggests that the emergence of a marketing strategy with consumers creating their own products has merit and should be considered by retailers. The roles and attitudes in young female shoppers’ decisions to create clothing accessories were examined and the most important beliefs influencing the purchase decision, identified. These may be used by marketers to develop market positioning and strategies.

The study considers the potential effect of external variables – such as age and frequency of mall visits – on a consumer’s attitude toward intended purchasing behavior. The younger respondents typically have more time on their hands to socialize and “hang out,” as evidenced by more frequent and longer mall visits (Li et al., 2004; Martin, C.A. and Turley, L.W, 2004). Further, recent research has indicated that conventional retailers may encourage young consumers’ positive emotions through a variety of design elements. Stimuli generating entertainment, interest and excitement may become more important than simply applying the right mix of merchandise and pricing (Park, et al., 2006). Being in a shopping mall, the respondents may exhibit favorable attitudes and beliefs toward the intention to perform a particularly stimulating buying behavior, namely creating handbags.

Interestingly, these millennials felt more strongly about creating their own clothing accessories than being with their friends.

TRA proposes that the closer in time one is to performing the behavior, the stronger is the predictive accuracy of the intent to perform that behavior. Survey results appear to be consistent with TRA inasmuch as the respondents, already in a shopping environment, exhibit strong attitudes toward creating clothing accessories on their next mall visit. This reflects itself in the respondents’ desire to create their own “look” and be influenced by their friends to stand out from the crowd in doing so.

TRA indicates that one’s evaluation of the relative importance of the intended behavior affects attitudes and beliefs toward that behavior. Results suggest that the respondents’ evaluation of the relative importance of the intended behavior
significantly affects both their attitudinal and normative beliefs toward their intention to perform the behavior. Interestingly, these millennials felt more strongly about creating their own clothing accessories than being with their friends. However, they also placed a high degree of importance on socialization in a shopping venue. Dias (2003) found that young people generally regard shopping as a social activity. They have been found to feel strongly about their independence (Taylor and Cosenza, 2002). While “hanging out with friends” in a shopping mall is quite common among teenagers, when presented with an opportunity to express their unique personality, they may prefer independence to socialization.

TRA also examines the role of social pressure on consumer intention to perform specific behaviors. Cronbach’s (1951) alpha test indicated that behavioral beliefs exhibited more reliability than did normative beliefs. Respondents think more of their own individual beliefs than how they perceive others would think about their behavior. The research results show that there is a significant effort on the part of both younger and older millennials to “push the envelope,” or go beyond normal expected behavior. This relationship is shown to be affected by how respondents feel others think about the intended behavior.

The older group tends to be influenced less by referents than does the younger group. As a person ages and matures, she is capable of making more independent decisions. Younger people seem to be more influenced by peer opinions (Becherer et al., 1982). The data suggest that the older group exhibits more rational decision-making, considering the implications of their actions prior to performing the behavior.

The study examines whether a person’s evaluation of possible outcomes of behavior performance affects behavioral attitude toward intention to perform the behavior. The research findings imply that the reliability of this evaluation process is not significantly linked to the respondents’ attitudinal beliefs.

*As a person ages and matures, she is capable of making more independent decisions. Younger people seem to be more influenced by peer opinions.*

TRA also seeks to validate whether people with positive beliefs about performing a particular behavior also have a positive attitude toward that behavior. TRA explains some of consumers’ belief-attitude-buying intention relationships for creating accessories, holding that positive beliefs determine positive attitudes which, in turn, strengthen the intention to create accessories. This has important implications for marketers in that a positive attitude and intention already exist, suggesting the need for further nurturing via a marketing campaign to create actual customers.

The present economic environment poses ever-increasing challenges for traditional retailers. New millennial trends in retailing have suggested that those who seek success in the coming years will be those who offer a unique product (Baker, 2004). Hands-on in-store customization is clearly a step in the right direction.

This paper applies the TRA in predicting whether there is a significant opportunity for entrepreneurs to open a create-your-own handbag retail establishment that may attract female consumers, especially pre-teens and young teens. Results indicate a high probability this market segment has a strong desire to patronize such a store. This discovery may suggest further research into a possible new market buying trend that focuses on creating one’s own products.
It may be extended to other possible market segments as well, e.g., offering young males the opportunity to create their own computer games.

Future studies may examine market differences in fashion consciousness between developed countries and less developed countries. For example, Parker et al. (2004) discovered significant differences in fashion consciousness between Chinese teens and their Japanese and U.S. counterparts. At the same time, the U.S. and Japanese teens showed similarities in their attitudes toward fashion. This area of research should be of interest to marketers because it offers the opportunity to achieve economies of scale and common marketing messages around the world.

Limitations

By focusing on millennials, the present study contributes to a more complete understanding of their attitudes, beliefs and purchase intentions. However, the findings from this study may not generalize well to the entire millennial population, as there may be significant regional or national differences in purchasing power, lifestyles, media usage and consumption patterns. At the time of this study, the concept of customizing handbags in a retail venue did not exist. Therefore, this actual behavior could not be measured.

The research did not consider the buyer’s perception of the ease or difficulty of performing a given behavior, which may vary across situations and actions. Ajzen (1991) offered the theory of planned behavior to compensate for TRA’s lack of volitional control. Control beliefs are measured in terms of resources and opportunities possessed by the individual, also taking into account obstacles or impediments. Future researchers may want to use this updated model to delve into the possible influence of volitional control on behavioral intention. TRA has limitations in its ability to predict behavior. A major weakness in the theory is a lack of emotionality as a component affecting one’s decision-making. Ajzen and Fishbein (1980, pp. 82 – 84) discount the impact of emotions because emotionality is not a rational behavior and therefore, exists outside the confines of TRA. In the present study, however, emotionality was construed as a component in many of the behavioral factors, as Teich (2001, p. 194) found in his study.

References


An Integrated Framework for Information Security Management

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Executive Summary

Today information assets face more potential security breaches than at any time in history. To help mitigate the effect of the threats, information security management (ISM) is a very important part of a successful organization’s strategic plan. Due to a significant increase in the number of threats over the past decade, organizations need to be proactive to protect their information assets. Unfortunately, there is a lack of experts qualified to address the area of IT security. We propose an integrated framework for ISM, in which it is conceptualized as a continuous decision-making process. The rationale of this framework is based on four guiding principles.

1) Have goal in mind.
2) Align security goals with business strategy.
3) ISM is a multivariate system.
4) ISM is a dynamic process.

ISM is more about the operating procedures and processes in which crucial components such as organizational infrastructure, human factors and information security practices are all involved.

Key components of the ISM framework include the following steps.

1. Assess the organizational environment.
2. Establish information security objectives.
3. Analyze information security requirements.
4. Develop information security controls.
5. Train/evaluate information security controls.

Researchers find that despite the seriousness of the nature and scope of the security threats posed by the environment, many organizations are under-prepared or completely unprepared to mitigate the threats systems.

Further, there appears to be a lack of consensus as to how an organization should implement an information security policy, what information security objectives should be established, or how to react when the information systems are threatened. The framework described herein could be utilized in an effort to effectively implement a holistic and successful ISM plan.
Introduction

Information security management (ISM) is becoming a critical component to the modern organization. In many cases, it is impossible, or nearly impossible, to run a business without the proper and smooth operation of its information systems (Zviran and Haga, 1999, p. 162). Threats to these information systems have increased significantly over the past decade, which requires organizations to be proactive to protect their information assets. Despite the seriousness of the threats, there is a lack of experts qualified to address the area of IT security (Furnell, Papadaki, Magklaras and Alayed, 2001, p. 89).

The CSI/FBI report ... found that 56 percent of the respondents reported some form of malicious attack within the past year. ... Given the organizations’ propensity to under report, it is important not to underestimate the seriousness of the threat in today’s security milieu.

There appears to be a lack of consensus as to how an organization should implement an information security policy, what information security objectives should be established, or how to react when the information systems are threatened. Further, Straub and Welke (1998, p. 443) find that despite the seriousness of the nature and scope of the security threats posed by the environment, many organizations are under prepared or completely unprotected to mitigate the threats. If an organization’s information security efforts are integrated so that all are focused on the same outcome, then the information security management of an organization should reside in a framework easily understood by all parties at all levels of the organization. Even without technological solutions, a systematic framework is essential for effective organizational information security management.

Although ISM is a critical issue in today’s business environment and has drawn considerable attention from researchers and practitioners, there is no universally accepted definition. Security has been defined as the state of being free from danger and not exposed to damage from accidents or attack, or as the process for achieving that state (Bosworth and Kabay, 2002, p. 2). Computer security has been defined as the necessary controls to ensure the continuity of adequate information and the protection of computing assets from loss or damage (GFOA, 1997, p. 44). In general, ISM is concerned with protecting the confidentiality, integrity, and availability of information and information systems (Blackwell, 1998, p. 26; Fried, 1994, p. 57).

Total quality management (TQM) may offer to provide a good foundation for ISM. TQM recognizes the importance of the customer, participation and teamwork and continuous improvement and learning. In the security context, these TQM principles should be supported and implemented by an integrated organizational infrastructure, a set of management practices and an appropriate set of tools and techniques. As such, the goals of TQM could benefit the security community.

Experience indicates that technology cannot provide all the answers to the security problems posed by people in the context of ISM. The CSI/FBI report, which was based on feedback from 697 computer security practitioners and represents a diverse slice of corporate America, found that 56 percent of the respondents reported some form of malicious attack within the past year (Gordon and Loeb, 2006, p. 12). This statistic is up from 54 percent the previous year. Yet another attempt to estimate the number of attacks comes from iDefense. They report monitoring approximately 27,000 attacks in 2004, half of which were designed to covertly steal information or take over computers.
Indeed, at no time in history has the threat to information assets been greater than it has today (Wright, 1994, p. 1). Many organizations are hesitant to report computer attacks for many reasons and most of these reasons center on a desire to avoid negative press. Given the organizations’ propensity to under report, it is important not to underestimate the seriousness of the threat in today’s security milieu.

In the context of this research, we define ISM as a continuous improvement process intended to assure business continuity, customer confidence, protection of business information assets and the minimization of damage to the business by preventing or minimizing the impact of security incidents. We propose an integrated framework for ISM (See Exhibit 1), in which ISM is conceptualized as a continuous decision-making process.

**A Proposed Framework of ISM**

The process follows five steps and contains a feedback mechanism which can effectively modify action taken within each step. The first step is to perform an initial analysis of the organizational environment including both internal and external factors. This organizational environment influences the information security objectives which are set by top management and those objectives dictate the security infrastructure and should be aligned with business strategy. To support the information security objectives, certain security practices should be implemented. The output is a secure source of the quality information needed by the organization to achieve its business goals. The proposed framework is a dynamic cycle, which must be adjusted based on an ongoing evaluation of the organization’s needs. The rationale of this framework is based on four guiding principles:

1. **Have goal in mind.**

   To make predictable progress in a complex situation, it is often beneficial to have a goal and then work towards that goal. This is the case in information systems security. The goal of ISM is to ensure business continuity, customer confidence, protect business investments and opportunities, or reduce damage to the business by preventing and minimizing the impact of security incidents. A good security program is a customized program and its characteristics depend upon the goals, resources and environment of the organization. Exhibit 1, the first three stages are involved in setting goals and objectives. In this process, the goals and objectives are derived from the initial assessment of the business environment and then translating

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**Exhibit 1. Proposed ISM Framework**

<table>
<thead>
<tr>
<th>Assess Organizational Environment</th>
<th>Establish Information Security Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implement / Evaluate Information Security Controls</td>
<td>Analyze Information Security Requirements</td>
</tr>
<tr>
<td>Develop Information Security Controls</td>
<td></td>
</tr>
</tbody>
</table>

**Framework Rational**

Many times there is a tradeoff between security and ease of use. For instance, a password that needs to be 10 characters long, contain mixed case, numbers and special characters, would typically provide better security than a four character password with no special requirements. However, the longer password presents a greater cognitive challenge for users. In fact many devices, including wireless access points, have major security problems at least partially because they are designed for easy access (Zviran and Haga, 1999, p. 164).
these goals and objectives to specific security requirements. The last two stages provide the mechanism to fulfill the goals.

2. Align security goals with business strategy

Generally, the alignment of IS strategy with business strategy is one of the key factors for IS and organizational success in the new “flat world” in which both markets and human resources are becoming more global (Gerth and Rathman, 2007, p. 103). Alignment helps facilitate acquisition and deployment of information technology resources that are in agreement with the organization’s long-term vision. Alignment may be evidenced through an understanding of organizational objectives by top information technology planners, mutual understanding between top managers and IS planners and a heightened view of the IS function within the organization (Pant and Hsu, 1999, p. 15; Reich and Benbasat, 2000, p. 82). Similarly, information security planning or strategy should be aligned with business objectives (Peltier, 2003, p. 22).

The number one principle in the Generally Accepted Systems Security Principles (GASSP) stipulates that information security supports the mission of the organization. In the proposed framework, alignment is needed at every stage of goal setting. In addition, it is also important in the implementation and evaluation stage to ensure that the business goals are being achieved.

3. ISM is a multivariate system

An organization is also perceived as a work system (Bostrom and Heinen, 1977, p. 14), which is made up of two independent, but interacting systems — social and technical. The technical system is concerned with the processes, tasks and technology needed to transform inputs to outputs. The social system is concerned with the attributes of people (e.g., education, skills and values), the relationships among people, reward systems and authority structures. The outputs of the work system are the result of joint interactions between these two systems.

The goal of ISM is to ensure business continuity, customer confidence, protect business investments and opportunities, or reduce damage to the business by preventing and minimizing the impact of security incidents.

Based on this understanding, ISM is a complex process, which includes all stages in the proposed framework. ISM has a distinct task and must have an organizational structure that supports reporting, communication, authority and work flow. Individuals or groups of stakeholders involved in ISM include customers, managers, maintainers, developers and users. Technological tools and methods that are used in security programs include the necessary hardware and software. Thus, ISM is not only a technical issue, but also a management issue as well.

4. ISM is a dynamic process

ISM is more about the operating procedures and processes, in which crucial components such as organizational infrastructure, human factors and information security practices are all involved. In the process of ISM, new vulnerabilities affecting infrastructure components and system applications are discovered almost on a daily basis, thereby requiring continuous efforts on the part of security professionals to stay up-to-date with the latest information security threats and tools on the horizon. Both individuals and organizations need to learn and adjust their efforts so that they can develop an effective information security program to see the expected outcomes. It is absolutely necessary that managers understand that business requirements such as organizational goals, organizational structure and ISM strategy must change as environmental factors such as technology, legislation and business practice constantly morph and evolve. From an emergent point of view, organizations and individuals have to make adjustments
Based on feedback and outcomes because there are gaps between organizational security objectives and technology readiness/functions. As a result, the information security program must be redesigned continuously for improvement. Due to the dynamic nature of the computer security paradigm, many current security “best practices” and security management strategies tend to be static, ineffective and dogma-based.

**Components of the ISM Framework**

**Step 1. Assess the Organizational Environment**

If an organization wishes to develop an information security program, the first step is to conduct a comprehensive assessment of their business environment and organizational goals. The business environment includes both external and internal factors; examples of external factors are institutions or forces (such as suppliers, customers, competitors, government regulatory agencies, public pressure) that are outside the organization and over which the organization has little control. These forces can potentially affect the organization’s performance (Porter and Millar, 1985, p. 150). The internal factors include business strategy, organizational culture, human resources, capital and available IT/IS security resources.

It has been suggested that organizations can determine their security needs based on an information risk assessment (Gordon and Loeb, 2006, p. 122), including the organization’s need to protect the integrity, availability and confidentiality of its information. This risk assessment brings together important information about the protection of the information system(s) that make up the organization. However, we argue that the determination of information security objectives should not be based solely on an internal analysis. It should also consider external forces. For example, businesses in some industries (government, healthcare, insurance, finance) tend to be interested in compliance with external agencies reporting requirements. The motivation of information security is the mitigation of legal action. In these situations, it is likely the information security initiatives come more from external pressure rather than internal forces. Further, the dynamic nature of information security (Kruger and Kearney, 2006, p. 289) dictates a frequent re-examination of the environment to stay apprised of the most current forces effecting security. The key questions to ask at this point should seek to uncover the recent security threats and developments.

During this stage, management performs activities that assess the size, scope and complexity of the security program and its related activities. These include:

1. Establish the security program steering committee or team
2. Establish a relationship with the external constituents (customers/users).
3. Establish the necessary management procedures for the development of the ISM program.

**Step 2. Establish Information Security Objectives**

The second stage in ISM is to develop the security objectives. The objectives should have a strategic, organizational focus and be made by executive-level management because top management and steering committee members often have a better understanding of overall business objectives and constraints.

Many professionals agree that the three essential/core objectives of ISM — confidentiality, integrity and availability (CIA) — can never be completely separated. Loss of one or more of these objectives can threaten the continued existence of the organization. Some researchers have included privacy in confidentiality (Krause and Tipton, 2002, p. 234). They claim that keeping data private means keeping it confidential.
In the Internet world, confidentiality has taken on an expanded meaning in the form of privacy controls. For other industries, such as healthcare and finance, privacy is now a regulatory issue. Other researchers have suggested even more objectives, such as ‘auditability’ and accountability, authorization, identification and anonymity (Host, 2001, p. 1). Based on their specific business environment and organizational goals, organizations should establish the appropriate objectives. It is critical in this step to make sure security objectives align with the organization objectives.

Step 3. Analyze Information Security Requirements

Any information security controls should be based on an analysis of information security requirements. The analysis should address all requirements for confidentiality, integrity and availability of information and should include a review of all legal, functional and other security requirements specified in the goals and objectives established in steps one and two of the proposed framework. Determination of requirements should be accomplished through both managerial and technical approaches. The managerial approach can be reviewing current procedures, policies and interviews with employees at different levels or through committee meetings.

The technical approach can consist of testing of vulnerability of existing hardware and software. This step focuses on what kinds of information and resources should be protected. In this stage, it is necessary to perform a trade-off analysis between the security requirements and functional requirements, because they almost always conflict. For example, requiring users to change a password weekly would provide increased security but would be imposition on users. Further, a security assurance analysis is also suggested. This analysis addresses the activities and assurance needed to produce the desired level of confidence that the information security measures will work correctly and effectively. The goal is to achieve cost-effective assurance that meets the requirements for protecting the organization’s information assets. Questions that can help organizations analyze their security requirements are presented in Exhibit 2.

Exhibit 2. Security Requirement Questions

<table>
<thead>
<tr>
<th>Question</th>
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<tbody>
<tr>
<td>What is the structure of the security team and what are its duties?</td>
</tr>
<tr>
<td>What personnel security policies should be implemented?</td>
</tr>
<tr>
<td>What use of equipment is acceptable?</td>
</tr>
<tr>
<td>What authentication mechanisms and password policies should be used?</td>
</tr>
<tr>
<td>Where and what kind of access controls should be used?</td>
</tr>
<tr>
<td>Where and what kind of physical security controls should be established?</td>
</tr>
<tr>
<td>What are the business continuity/disaster recovery plans?</td>
</tr>
<tr>
<td>What steps to take to respond to a security incident?</td>
</tr>
</tbody>
</table>

The outcomes from this process will be notes, documents of procedures, or business rules and policies. Additional specific guidelines, adopted from US-CERT, (www.us-cert.gov/reading_room/brouchure_securityguidance.pdf) that could guide IS security initiatives are found in Exhibit 3. Most of the time, it is necessary to structure or re-organize established requirements. For such purposes, computer-based tools can be helpful. For example, to perform risk analysis, COBRA, SPRAT and UnRiskIT can be used.
### Cyber Security Guidance - Users

- Make your passwords complex. Use a combination of numbers, symbols and letters.
- Change your passwords regularly (every 45 to 90 days).
- Do NOT give any user names, passwords or other computer/Web site access codes to anyone.
- Do NOT open e-mails or attachments from strangers.
- Do NOT install or connect any personal software or hardware to your organization's network or hardware without permission from your IT department.
- Make electronic and physical back-ups or copies of all your most important work.
- Report all suspicious or unusual problems with your computer to your IT department.

### Cyber Security Guidance - Administrators

- Implement Defense-in-Depth — A layered defense strategy that includes technical, organizational, and operational controls.
- Establish clear policies and procedures for employee use of your organization's information technologies.
- Implement Technical Defenses — Firewalls, intrusion detection systems and Internet content filtering.
- Update your anti-virus software daily.
- Regularly download vendor security "patches" for all of your software.
- Change the manufacturer's default passwords on all of your software.
- Monitor, log and analyze successful and attempted intrusions to your systems and networks.

### Physical Security Guidance

- Monitor and control who is entering your workplace: current employees, former employees and commercial delivery and service personnel.
- Check identification and ask individuals to identify the purpose of their visit to your workplace.
- Report broken doors, windows and locks to your organization’s or building’s security personnel as soon as possible.
- Make back-ups or copies of sensitive and critical information and databases.
- Store, lock and inventory your organization's keys, access cards, uniforms, badges and vehicles.
- Monitor and report suspicious activity in or near your facility's entry/exit points, loading docks, parking areas, garages and immediate vicinity.
- Report suspicious-looking packages to your local police. DO NOT OPEN or TOUCH them.
- Shred or destroy all documents that contain sensitive personal or organizational information that is no longer needed.
- Keep an inventory of your most critical equipment, hardware and software.
- Store and lock your personal items such as wallets, purses and identification when not in use.

### Surveillance

- Are you aware of anyone recording or monitoring activities, taking notes, using cameras, maps, binoculars, etc., near a key facility?
- Have you observed abandoned vehicles, stockpiling of suspicious materials, or persons being deployed near a key facility?
- Are you aware of any attempts to penetrate or test physical security or procedures at a key facility?

### Step 4. Develop Information Security Controls

This step determines which security procedures and controls should be implemented, based on the security requirements identified in the previous step. Generally, information security controls are grouped into procedural controls and technical controls. Procedural controls address and strive to protect the interface between humans and the security system, while technical controls are tools or techniques used to enforce security. We provide several examples of information security controls that can be applied in an organization (see Exhibit 4). For each control, a representative sample of items is provided for consideration.
**Exhibit 4. Information Security Controls**

<table>
<thead>
<tr>
<th>Information Security Policy</th>
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</thead>
<tbody>
<tr>
<td>- Specifies the information security responsibility of employees</td>
</tr>
<tr>
<td>- Illustrates the importance of security to the organization</td>
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<tr>
<td>- Has an owner who is responsible for the policy's update and maintenance</td>
</tr>
<tr>
<td>- Has management's support for information security programs</td>
</tr>
<tr>
<td>- Defines information security objectives</td>
</tr>
<tr>
<td>- Is regularly reviewed for effectiveness and completeness</td>
</tr>
<tr>
<td><strong>Organizational Security</strong></td>
</tr>
<tr>
<td>- Authorizes the ISM committee to make necessary decisions</td>
</tr>
<tr>
<td>- Has information security advisors in each business unit to coordinate ISM</td>
</tr>
<tr>
<td>- Has a dedicated security steering committee responsible for ISM</td>
</tr>
<tr>
<td>- Has an information security forum to give management direction and support</td>
</tr>
<tr>
<td><strong>Asset Classification and Control</strong></td>
</tr>
<tr>
<td>- Information assets are clearly labeled based on level of confidentiality</td>
</tr>
<tr>
<td>- Information assets are classified based on level of confidentiality</td>
</tr>
<tr>
<td>- Information asset classification system is simple and effective</td>
</tr>
<tr>
<td>- Information assets are recorded based on ownership</td>
</tr>
<tr>
<td><strong>Business Continuity Planning</strong></td>
</tr>
<tr>
<td>- Is tested regularly</td>
</tr>
<tr>
<td>- Includes a risk analysis of critical processes</td>
</tr>
<tr>
<td>- Is assessed using effective techniques</td>
</tr>
<tr>
<td>- Ensures speedy resumption of essential operations after system failure</td>
</tr>
<tr>
<td><strong>System Technical Control</strong></td>
</tr>
<tr>
<td>- Monitors and logs access and use of computer systems</td>
</tr>
<tr>
<td>- Has procedures for mobile computing control</td>
</tr>
<tr>
<td>- Employs password management systems</td>
</tr>
<tr>
<td>- Requires routinely reviewing audit logs</td>
</tr>
<tr>
<td>- Requires proper authentication for external connections</td>
</tr>
<tr>
<td>- Audits all activities related to working remotely</td>
</tr>
<tr>
<td>- Requires users to follow security practices in selection and use of passwords</td>
</tr>
<tr>
<td><strong>Systems development and maintenance</strong></td>
</tr>
<tr>
<td>- Has formal procedures to maintain the security of application software including application testing, changing and replacing</td>
</tr>
<tr>
<td>- Uses cryptographic techniques to protect confidentiality, authenticity and integrity of information</td>
</tr>
<tr>
<td>- Protects system files by controlling program source libraries in the development process to restrict possible corruption or tampering</td>
</tr>
<tr>
<td>- Has formal procedures to ensure security is built into operational systems</td>
</tr>
<tr>
<td>- Follows risk assessment and risk management processes to determine acceptable controls</td>
</tr>
<tr>
<td><strong>Communications and Operations Management</strong></td>
</tr>
<tr>
<td>- Has a backup/ recovery process to maintain the integrity and availability of essential information processing and communication services</td>
</tr>
<tr>
<td>- Protects the integrity and security of essential software and information against virus and intrusion</td>
</tr>
<tr>
<td>- Has policies requiring compliance with software licenses and prohibiting the use of unauthorized software</td>
</tr>
<tr>
<td>- Takes appropriate security measures for publicly available systems such as Web servers</td>
</tr>
<tr>
<td><strong>External Security</strong></td>
</tr>
<tr>
<td>- Has formal agreements with partners for the exchange of information</td>
</tr>
<tr>
<td>- Takes appropriate security measures for electronic commerce to ensure information exchange</td>
</tr>
</tbody>
</table>
To have an effective security program, there should be a task team or steering committee to keep the program up-to-date. This team should have representation from the major business units, as well as from the information security team and the legal department. This team should have authority to make the necessary decisions. Since the security policy and controls should be changed to “fit” changing security objectives, periodic reviews for effectiveness and completeness are important and additional updates may be necessary whenever there is a significant change in the organization’s direction or environment.

Step 5. Train / Evaluate Information Security Controls

Information security training and management support are possibly the most important components of an effective information security program. Training can increase security awareness, understanding and thus, participation. A good training program consists of courses (both initial and refresher classroom and/or online), regular updates, collateral material such as posters and a system of rewards and penalties for desirable and undesirable behavior. There is much collateral material available at: www.us-cert.gov/

It is absolutely necessary that managers understand that business requirements such as organizational goals, organizational structure and ISM strategy must change as environmental factors such as technology, legislation and business practice constantly morph and evolve.

It is necessary to continuously review logs, so that problems can be caught and fixed quickly. In addition, good systems, network and security administrators often perform other kinds of monitoring functions – e.g., running sniffers or integrity checkers. Reporting procedures are necessary to provide input for measurement, audit and monitoring. In particular, reports of the activities mentioned above should be reviewed during the monitoring process so that potential problems can be addressed and the information can be used in diagnosing anomalies.

Many organizations employ the use of technical tools as a mechanism for controlling information assets. These are typically IS-based tools that allow the organization to use their information systems resources to check on four basic groups of controls: authentication, authorization, access control and monitoring (Bachman, 2002, p. 8). Authentication controls are designed to verify the identity of the person or system that is requesting access. Some examples of authentication mechanisms are: username/ password and certificates — Public Key certificates, hardware tokens and multi-biometrics. Access controls are designed to enforce the decisions of the authorization system by allowing or denying access. Examples of access control systems are: firewalls, file encryption and virtual private networks.

Monitoring tools are used to watch for anomalies and raise alarms. Server logs and intrusion detection systems are examples of monitoring tools. Virus scanners are also monitoring tools.

It is important to remember that none of these technical controls can be effective unless they are applied in a coordinated manner and managed appropriately.

A response procedure (backup and recovery plan) is important. When a security incident is spotted, administrators should have a plan for dealing with it. This plan should include
documentation and notification requirements and escalation procedures. In addition, it may include measures to preserve evidence in case prosecution becomes necessary.

**Conclusions**

As with any business process, in order to determine whether an organization is meeting its goals, the organization needs to measure its progress. Evaluation allows finding out whether the organization is receiving the return on investment, as well as whether the program is running effectively and efficiently. Numerous metrics or tools can be used for this purpose. Organizations can measure the number of incidents detected and addressed, whether the security team met Service Level Agreements for responding to change requests and how many hours were spent reviewing logs.

*Information security training and management support are possibly the most important components of an effective information security program. Training can increase security awareness, understanding and thus, participation.*

Unfortunately, the aforementioned steps give only a general idea of the health of the security system. They can be corrupted and mislead decision makers. For example, if we measure the number of security incidents reported by assuming that fewer incidents is better, then the security team could receive a better rating simply by reducing its monitoring efforts. If the management team does not investigate the meaning of the metrics, the security improves on paper while becoming less effective in reality (Bachman, 2002, p. 5). However, as part of a holistic plan for security, the health of systems can be tested by an independent party such as the audit group or an outside vendor.

Lastly, as are other IT development processes, information security is also an improvement process. The maturity of the security process itself should be measured and adjusted to meet the needs of the organization. One way to do this is to compare the process and its parts to a maturity scale (see Exhibit 5). This scale is adapted from a capability maturity model for software (Paulk, Curtis, Chrissis and Weber, 1993, p. 8). It is important to note that not all organizations should strive for Level 5 processes. Moving up the scale is expensive and return on investment should be considered when setting goals.

**Exhibit 5. Information Security Maturity Scale**

<table>
<thead>
<tr>
<th>Level</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1: Ad hoc</td>
<td>ISM functions are performed as needed. The process is generally chaotic.</td>
</tr>
<tr>
<td>Level 2: Repeatable</td>
<td>ISM functions are performed regularly, usually in the same way.</td>
</tr>
<tr>
<td>Level 3: Defined</td>
<td>ISM functions are documented and performed in a standard manner.</td>
</tr>
<tr>
<td>Level 4: Managed</td>
<td>Performance of ISM functions is monitored, measured and reviewed in an ongoing manner.</td>
</tr>
<tr>
<td>Level 5: Optimized</td>
<td>ISM processes are verified, integrated, controlled and continually improved</td>
</tr>
</tbody>
</table>
To help provide insights into the context in which the information security issues can occur and to understand the basis of the approaches suggested by both researchers and practitioners, we have proposed an integrated framework for ISM. This framework offers several benefits:

- First, it serves as a common ground for integrating all types of information security functions
- Second, it helps answer questions of how to react to information security issues
- Finally, it helps identify what are the important components involved in establishing and maintaining information security initiatives

A response procedure (backup and recovery plan) is important. When a security incident is spotted, administrators should have a plan for dealing with it.

By following the framework proposed in this article, information security practitioners can determine how to initiate an ISM plan to provide secure and high quality information for their organizations. Due to the rising popularity of mobile and wireless systems, voice over-IP, development of supply chain integration, business application outsourcing and other new developments, new vulnerabilities will be created on a consistent basis. Given this ever-changing security paradigm, the effective way to protect information assets is to develop an ISM program based on the framework proposed in this article.

References


Executive Summary

Every day the headlines are full of news of giant corporations that have fallen into bankruptcy or stand on the brink of the abyss. Business school educators can seize this opportunity and turn these calamities into valuable teaching tools, as bankruptcy is not just about insolvent companies and creditors scrambling to get paid, nor is it simply limited to legal issues. To the contrary, modern bankruptcy scenarios provide a wonderful teaching opportunity across a broad swath of disciplines and provide educators with the ability to explain and examine the vital interaction between finance, accounting and management, to name a few. This article highlights a few key points and posits a methodology for teaching them.

Introduction

Enron and WorldCom are infamous names familiar to most people. More recently and at a different “altitude,” we have Delta, Northwest and United. And who in America today has not agonized over the bankruptcies of the once great Lehman Brothers, Chrysler and — possibly most astonishing of all — General Motors? Once again, “megabankruptcies” preoccupy the world of business. Banks, financial institutions, vendors and businesses of every size and shape must grapple with grave issues when a customer, supplier or competitor files for bankruptcy (and even when one of these institutions joins the rolls of the insolvent).

Business educators must take careful note as well. Today’s bankruptcy process offers a multitude of lessons, among them: how to avoid the abyss of insolvency; methods of restructuring the troubled concern; and shaping strategies to maximize creditor recovery. Yet there is so much more, for modern bankruptcy proceedings offer enlightening insights on the legal and business environment that our students will soon enter.

Bankruptcy can be a vital and interesting tool to inculcate students with a number of essential concepts of modern business critical to their future success. The purpose of this article is to highlight just a few of those points and suggest a methodology for teaching them.

Finance and Secured Lending

In business today, nearly everyone borrows money to finance its growth. We teach classes wherein we demonstrate to students the theory of corporate finance. Bankruptcy is the crucible where we test mere theory to the maximum and discover what works and what doesn’t. It is easy to apply those real world lessons in the classroom.
Secured Creditor Status –
A Worthwhile Goal

Creditors in bankruptcy cases can be divided into two fundamental classes: secured creditors and unsecured creditors.

Secured creditors loan money on the basis of a promise to repay (with interest, of course), joined to a pledge of collateral (“secured assets”). In the event of default, the collateral will be turned over to the lender in satisfaction of the unpaid debt. This is the very essence of secured lending and the entire asset-based lending (ABL) industries.

Immediately, we have two valuable business lessons. One, in secured financing, the borrowing business either repays in debt in real dollars (the nominal way) or, if it cannot, then it effects repayment by the surrender of the pledged asset, voluntarily or by court proceedings. Oft times, bankruptcy cases powerfully illustrate the latter as the lender’s means to retake the pledged asset.

Second, businesses will many times borrow money to purchase an asset and then pledge that newly acquired asset as collateral. This is “purchase money financing,” and it amply demonstrates how one can grow a business by carefully managing debt to acquire productive assets. It also highlights sound business judgment that the newly acquired asset must “earn its keep,” and individually or jointly generate sufficient revenue to pay for itself.

Secured creditors are basically the more intelligent among creditors; bankruptcy teaches that if the debtor can’t repay the debt in real money, it repays it by surrendering the asset. Thus, such creditors in a very real sense are “secured,” in that they are assured that, one way or another, they will be made whole on the loan. Tomorrow’s financial mavens are thus well taught to seek the exalted status of the secured lender.

By contrast, unsecured creditors take a less circumspect approach and certainly a great deal more risk. Unsecured creditors loan money, provide services or sell goods on a mere good faith promise to repay. They are “unsecured” because they lack security. The borrower has no asset, or collateral, that can be used to repay the lender. Thus unsecured creditors bear the highest risk of not being repaid.

Bankruptcy powerfully reinforces the notions of due diligence, conservative asset valuation and carefully measuring credit risk.

In blunt terms, secured creditors could be described as “smart” creditors, because the expectation of repayment is backed up by a very real asset. On the other hand, unsecured creditors are just not that smart; unsecured creditors extend credit and/or goods on faith alone. Such appellations may be unkind, but they are nonetheless true. It is imperative to cement knowledge of these distinctions into the minds of students.

The Detriment of Unsecured Creditor Status in a Bankruptcy Case

The difference between secured and unsecured creditors takes on significant proportions in bankruptcy cases. There we find unsecured creditors are at the very end of a long line of creditors. In all too many cases, they receive a minimal payout or even nothing at all. Truly, unsecured creditors fare the worst in modern business bankruptcies.

We can utilize this to impress upon students the significant risks associated with being an unsecured creditor. Clearly, the lesson to be emphasized across the entire spectrum of business learning is that it is far preferable to be a secured rather than an unsecured creditor. Emphasize this as a management decision.
that has significant impact on a company’s finances and accounting for reserves and you have taught some valuable lessons in the aforementioned three disciplines, aside from business law itself.

Secured Creditor Status Does Not Come Easily

But we must remember to impress upon our audience that even secured creditors are not unassailable. In truth, classification as a “secured” creditor is but a term unless the underlying collateral maintains its fair market value. If it does not, the creditor succumbs to “undersecured” status, a dangerous place to be.

Take a Lesson from the Airline Bankruptcies

Consider the fate suffered by all too many secured creditors in the Continental Airlines bankruptcy. They had loaned huge amounts of money to finance purchases of new aircraft at the peak of the pricing cycle for such acquisitions. Those aircraft had severely depreciated in market value when Continental filed for bankruptcy. Thus, secured creditors were left with collateral whose market value was tens of millions of dollars less than the outstanding loan.

Creditors in such a position can then be easily “squeezed” by a smart debtor. Undersecured creditors face an unsavory choice; take back the asset, whose value no longer covers the debt and write off a significant loss. The alternative is to “restructure” the debt; in simple fact let the debtor keep the asset, free of repossession and then have the debtor repay the loan that has been greatly reduced in principal, debt service or both. Too many creditors in Continental took the second path, simply to make some recovery and avoid being stuck with a low value asset and a high writeoff.

To be sure, this explains much of the malaise of the more recent airline bankruptcies. While never stated outright, United and U.S. Airways, to name two, managed to stay airborne partly because ostensibly “secured” aircraft financiers knew that, in truth, their collateral had severely diminished in market value, given that hundreds of commercial jet airframes sit idle in desert “boneyards.”

These lenders knew that recapturing their collateral would not only be futile, but dangerous to their balance sheets, by saddling them with non-performing assets. After all, bankers are in the business of loaning money, not owning airplanes. Witness the subsequent reorganization cases of Delta and Northwest, who underwent surprisingly little pressure from their financiers, mainly because nobody wanted to take back the airplanes pledged as collateral. An interesting contemporary case study, most certainly.

...Secured creditors could be described as “smart” creditors, because the expectation of repayment is backed up by a very real asset. ...Unsecured creditors are just not that smart; unsecured creditors extend credit and/or goods on faith alone.

Teaching Diligence is Teaching Success

What’s the lesson to tomorrow’s bankers and financiers? Bankruptcy powerfully reinforces the notions of due diligence, conservative asset valuation and carefully measuring credit risk. Pay careful attention to the viability of potential assets, avoid overconfidence in the value of the asset serving as collateral and don’t be generous with the amount of the loan secured by that asset. Seek to ensure an “equity cushion,” that is, extending a loan in an amount safely below the current fair market value, thus establishing a “cushion” that the collateral’s market value must descend to before you risk the debt declining into “undersecured” status.
Any doubt that these skills need to be taught in the classroom were ended forever by contemporary events. Witness (as if you had a choice!) the current debacle. Just as secured creditors in years past did not want to wind up owning devalued aircraft, today’s banking institutions are racked with fear that they will wind up owning overpriced real estate and other assets that they once loaned money out on. This explains much of the credit paralysis in the financial sector and the resultant government bailout. Today we as a nation are paying the price for the past’s utter disregard of fundamental lending principles. An introduction to secured lending, unsecured creditor status and bankruptcy law is a good start towards making sure future generations do not repeat these mistakes.

Credit, Collection and Bankruptcy “Preferences”

Consider the following scenario: You are a business owner and recently a troubled customer paid a long overdue bill. Soon you hear the customer filed for bankruptcy. Months later, the bankruptcy court demands you return the money. What? I have to give back money lawfully paid? How did I get into this mess and what can I do?

Pay careful attention to the viability of potential assets, avoid overconfidence in the value of the asset serving as collateral and don’t be generous with the amount of the loan secured by that asset.

What is a Bankruptcy “Preference”?

Welcome to the strange and expensive world of “preferences.” Modern law presumes that a troubled company “prefers” some creditors over others in its final days before officially filing for bankruptcy. For example, Acme Toys is in serious financial distress. The CEO has two invoices on her desk; one from Shocking Electric Company, which threatens an immediate termination of service and the other from Stretcho Plastics demanding payment for its last shipment. She quickly concludes that there is enough raw material on hand, so she can stall the vendor Stretcho, but failure to pay the utility will immediately shut down Acme. Madame CEO makes the obvious choice and a preference is born.

The Bankruptcy Code demands all such preferential payments be returned to the post bankruptcy debtor, which will then combine the money with all other funds and then money will be paid to all creditors equally. All other things being equal, in the case of Acme Toys the utility and the vendor will each get some (but not all) the money they are owed, in an equal percentage and avoid the obvious injustice of the electric company being repaid 100 percent and the supplier zero.

Now a preference is a preference and it must be repaid, unless you can demonstrate that the payment was received in the “ordinary course of business,” i.e., that this payment, while made just before the debtor filed for bankruptcy, was nonetheless made as part of an overall, repetitive course of dealing between the parties, again in the “ordinary course” of business. This gives rise to the preference defense of the same name. And who finds these notorious preferences and provides the data for the “ordinary course” defense? Accountants, because the search for preferential payments and devising a defense to the allegation is largely an accounting exercise.

Preferences as a Learning Tool for Modern Business

Here’s the lesson for business. Modern corporations have “C &C” functions: that is, “Credit and Collections” departments, or at
least one responsible person. Preferences can and should be prevented. We can train the C & C managers of tomorrow by inculcating them with the mandate to carefully and continually monitor customers, their payment status and their overall financial health (here is where Dun & Bradstreet and similar services provide an important function). A well educated credit and collections professional will keep tabs on customers, keep them up to date and thus minimize or even eliminate altogether payments that arrive too close to bankruptcy and thus become tainted as preferences.

Preferences Are About Management and Marketing, Too

Based on the foregoing, we can anticipate the inevitable clash between the C & C person, usually trained in finance and accounting and the sales force, more driven by marketing and management dicta. Every day in business brings about confrontations between aggressive sales personnel who push sales, sometimes without regard for the likelihood of repayment and more conservative credit managers, who want to pull back and curtail financial risk. Upper management, with years of experience and hopefully well trained with an advanced degree in business, will recognize the pros and cons of each side and resolve it in a way that maximizes sales while minimizing credit risk.

This topic provides a rich vein to be mined. Practical lessons can be taught in the proper role of Credit and Collections personnel safeguarding the financial health of an enterprise and the need for marketing and sales people to be cognizant that selling entails not only the risk of not making the sale, but of not being paid on a sale made. This is a stark reminder to management disciplines that their overall vantage point requires a delicate balancing of competing interests in order to assure that the business functions properly. Again, business lessons abound across a wide swath of disciplines when discussing bankruptcy preferences.

The Risks of Entrepreneurship

An essential component of modern business education is entrepreneurship. Aspiring business moguls need the skills necessary to conduct due diligence, make well reasoned decisions and then take sensible risks. It is also important to remind them of the price of failure.

Injuring the True Owners – The Shareholders

The end game of the bankruptcy process is a grim reminder of the consequences of mismanagement. It is axiomatic that creditors suffer in bankruptcy cases, but the ultimate pain is inflicted upon shareholders, whose interests are quite literally erased from existence.

*Today we as a nation are paying the price for the past’s utter disregard of fundamental lending principles.*

By law and by cold reality, the interests of shareholders are wiped out in bankruptcy cases. “Reorganization” means there is nothing left for equity holders and thus former ownership is eradicated. This exemplifies the established axiom that shareholders assume the ultimate risk of loss, as the entity’s ultimate owners. We would do well to remind our audiences that “free market” includes the freedom to fail alongside the freedom to succeed. Having one’s equity holdings wiped out in a Chapter 11 could indeed be the ultimate downside of entrepreneurship. Almost as an aside, we also see the efficacy of the corporate form of business ownership, since shareholders lose the totality of their investment in the defunct corporation, but their personal fortunes are unscathed.

Keep in mind that in numerous “megabankruptcies” the existing shareholders are erased and are replaced by creditors who take on new ownership stakes in the
“reorganized” company in lieu of an actual cash distribution on their claims. Quite naturally, students are often perplexed when they discover that the shares of reorganizing corporations are still being publicly traded. Part of our job is to ensure that they are not taken in by these mere appearances. First, such trading is usually done by ultra-sophisticated “vulture” investors on a less prestigious trading platform (i.e., over-the-counter or via the “bulletin board”). Second, such “investors” have a much different agenda and are concurrently buying up debt (which gives them a legitimate position as a creditor) as part of a concerted plan to buy out the distressed corporation lock, stock and barrel. Third, some people do stupid things, such as buying and selling Enron even after it filed for Chapter 11. Pragmatic advice goes hand in hand with academic theory on these points.

Creditors often find themselves to be the new equity stakeholders in the aftermath of major reorganization cases. For example, KMart recently paid its creditors with stock in the “new” KMart, because it did not have enough cash to pay out their claims. In the recent past, the bulk of creditors in Continental Airlines were issued shares in the restructured company that emerged from bankruptcy, while former shareholders, including many company pensioners with all their retirement assets tied up in the airline’s old stock, were wiped out. And finally, we have the yet to be resolved bankruptcy of Lehman Brothers. Even today, long before we have a final outcome, the horrific erasure of the accumulated wealth of employees and shareholders invested in Lehman stock is a painful and indelible stain upon the history of entrepreneurship.

A High Price to Be Paid

Indeed, the Lehman case is a most telling lesson in the human cost and tragedy that comes from making poor business judgments. It could very well be that such lessons are worthwhile not only from an orthodox business perspective, but from a business ethics standpoint as well, with regard to corporate responsibility.

Yet there is one further lesson. Not long ago, we witnessed firsthand the criminal convictions of the late Kenneth Lay and Jeffrey Skilling, former CEOs of Enron. We saw firsthand the harsh penalties to be paid by those who cheat, those who lie, those who by corrupt means drive a company into bankruptcy. With respect, we must observe that Mr. Lay left this mortal coil very shortly after his conviction was handed down. His death may have been caused by the strain and embarrassment of his trial. Certainly his condemnation inside and outside of the courtroom must have been overwhelming. There is a moral price to be paid for corporate malfeasance, a lesson we should remember when discussing the ethical constraints that should guide the conduct of modern business. Let the catastrophe of that bankrupt entity be the final lesson, not so much in the risks of entrepreneurship, but the calamities that are likely to ensue if someone violates the law when in business.

The end game of the bankruptcy process is a grim reminder of the consequences of mismanagement.

In Conclusion

It is not an understatement to say that the foregoing only represents the mere tip of the iceberg of business education lessons that can be culled from modern bankruptcy cases. For this brief overview, the author selected only a few of the more pertinent ones that are multidisciplinary and thus would resonate across many fields of study. Many more abound, with valuable lessons in management, accounting, finance and of course business law.
But the point is well made. We as educators are obligated to view the corporate bankruptcies of today as more than simply examples of businesses gone wrong. Rather, we have a profound duty to take this one domain of modern business and extract countless lessons that will prove of great value to our constituency and enhance its success in the real world.

Endnotes

1 See Uniform Commercial Code, Article 9 (secured transactions).
2 Uniform Commercial Code Section 9-201 (definition of “purchase money security interest”).
3 Bankruptcy Code Section 362, the “automatic stay,” whereby a secured creditor can petition the court for permission to seize the secured asset upon the debtor’s nonpayment.
4 Bankruptcy Code Section 507 (in priority of repayment to creditors, unsecured creditors are last).
5 Robson, “Desert Airlines,” (Motorbooks International 1994), a pictorial history of the hundreds of aircraft, almost all from defunct commercial airlines, mothballed in the Mojave Desert of California.
6 Bankruptcy Code Section 547.
7 Id. at subsection (b), setting forth the statutory preference defenses.
8 Bankruptcy Code section 1101, et seq., commonly known as “Chapter 11.”
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