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INVESTMENT CLIMATE AND FOREIGN DIRECT INVESTMENT: A STUDY OF SELECTED COUNTRIES IN LATIN AMERICA

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ABSTRACT

Since the early 1980s, developing countries around the world have lifted restrictions on foreign capital inflow. Among the Latin American countries, Mexico has now become a prime destination of FDI. There are however eight other countries in the region --Argentina, Bolivia, Brazil, Costa Rica, Ecuador, Nicaragua, Panama, and Peru, that have emerged as Mexico's main regional rivals as FDI destinations. For this sample of nine countries, this study econometrically estimates the determinants of FDI, examines the relationship between FDI and economic freedom, and analyzes the investment climate from foreign firms' perspective. Using panel regression models, this study finds that FDI inflow is significantly boosted by foreign investors' increased familiarity with the host economy, better infrastructure, higher return on investment, and greater trade openness, but the inflow is significantly depressed by lack of economic freedom. Furthermore, this study finds that FDI inflow is negatively correlated with policy changes that result in higher trade barriers, more repressive taxation, more restrictive foreign investment code, more repressive financial system, and further price and wage controls. Finally, this study identifies two factors --excessive bureaucracy and inefficient financial markets, which have possibly created locational disadvantages for Mexico vis-à-vis its regional rival countries.

INTRODUCTION

Foreign direct investment (FDI) can be generally defined as the process that allows investors of a source country to acquire substantial ownership of capital and controlling interest in an enterprise in a host country. The IMF *Balance of Payments Manual* defines FDI as "an investment that is made to acquire a lasting interest in an enterprise operating in an economy other than that of the investor, the investor's purpose being to have an effective voice in the management of the enterprise" (Moosa, 2002).

FDI not only serves the long-term financial interests of foreign investors, it can also play a critical role in the growth dynamics of host countries. The literature holds that FDI can fill at least three "development gaps" in developing countries. FDI can fill, first, the "investment gap" by providing the much-needed capital for domestic investment; secondly, the "foreign exchange gap" by providing foreign currency through initial investments and subsequent export earnings; and finally, the "tax revenue gap" by generating tax revenues through creation of additional economic activities (Smith, 1997). FDI can also help generate domestic investment in matching funds, facilitate transfer of managerial skills and technological knowledge, increase local market competition, create modern job opportunities, increase global market access for locally produced export commodities, etc., all of which should ultimately contribute to host countries' economic growth.

Recognizing the benefits of FDI, developing countries have generally eased restrictions on the inflow of foreign capital since the early 1980s. Furthermore, the end of the Cold War in the early 1990s resulted in a new political dynamics that forced LDCs, hitherto heavily dependent on foreign public aid regardless of their political ideological leanings, to seek out alternative sources of foreign private capital. As a result, the annual FDI inflow to developing countries increased manifold from $23 billion (0.7% of their combined GDP) in 1990 to about $211 billion (2.6% of combined GDP) in 2004 (World Bank, 2006).

Among developing regions, Latin America receives a very high share of FDI. This perhaps can be explained by two factors --first, having formed many trade blocks (such as MERCOSUR, Andean Community, etc.), these countries are at the forefront of free trade movement, which helps attract FDI to the entire region, and secondly, the geographical proximity to the U.S. and Japan --the two most significant source countries of FDI, can also boost their locational advantage. The World Bank (2006) reports that the annual FDI inflow to Latin America & Caribbean countries jumped from $8 billion (0.8% of regional GDP) in 1990 to about $61 billion (3.0% of regional GDP) in 2004. One country in this region that deserves special attention is Mexico, which, due to its membership in NAFTA, has become a magnet for FDI and is currently among the most important destinations of FDI in the world. There are eight other countries in Latin America --Argentina, Bolivia, Brazil, Costa Rica, Ecuador, Nicaragua, Panama, and Peru, that have emerged as Mexico's main rivals as FDI destinations in the region. Table 1 below shows ten year (1995-2004) averages of FDI inflow as a ratio of GDP for each one of the sample countries and their differences with Mexico's average FDI/GDP ratio.

Table 1: FDI/GDP Ratio for Selected Countries in Latin America

Country	Average FDI/GDP (%) (1995-2004)	Difference with Mexico
Argentina	2.94	+ 0.01
Bolivia	7.46	+ 4.53
Brazil	3.24	+ 0.31
Costa Rica	3.38	+ 0.45
Ecuador	4.09	+ 1.16
Mexico	2.93	---
Nicaragua	5.33	+ 2.40
Panama	6.13	+ 3.20
Peru	4.74	+ 1.81

Source: World Development Indicators, World Bank (2006)

For this sample of nine countries in Latin America, this study econometrically estimates the determinants of FDI, examines the relationship between FDI and economic freedom, and analyzes the investment climate from foreign firms' perspectives. The results found in this study further our knowledge of the factors that affect FDI, which should be helpful for devising effective strategies to attract more FDI into this region.

LITERATURE REVIEW

An extensive empirical literature exists on the flow of FDI to developing countries. Most of these studies have identified domestic economic environment, market size, quality of infrastructure, labor cost, economic openness, return on capital, political stability, etc. among the key variables that drive the flow of FDI. There are many instances of conflicting results regarding the direction of influence of the determinants of FDI (Chakrabarti, 2001). For example, Wheeler and Mody (1992) found that labor cost has positive effects on FDI, but Schneider and Frey (1985) found the opposite, and Schneider and Frey (1985) found that political instability significantly depresses FDI, while Loree and Guisinger (1995) found the effects to be insignificant. Notwithstanding these differences, the FDI literature has continued to grow and capture the fascination of applied development economists.

Many studies have found that political instability seriously erodes foreign investors' confidence in the local investment climate repelling foreign investment away. Barro (1991) and Corbo and Schmidt-Hebbel (1991) stated that political instability creates an uncertain economic environment detrimental to long-term planning, which reduces economic growth and investment opportunities. Leavell et al. (2004)

addressed the importance of political structure, level of political corruption, efficient markets, enforceable contracts and property rights in attracting FDI. Asiedu (2002) and Haque et al. (1997) contended that countries located in Sub-Saharan Africa are perceived as inherently risky, which likely keeps foreign investors away from that region. Quazi and Rashid (2004) found that when economic freedom is incorporated as a determinant of FDI, there remains no inherent bias against Sub Saharan Africa, but there is indeed a regional bias in favor of countries located in Latin America & Caribbean vis-à-vis other developing regions.

Many empirical studies in the FDI literature have found domestic market size to be a significant and robust determinant of FDI. Scaperlanda and Mauer (1969) put forth the hypothesis that FDI inflow responds positively to the recipient country's market size once it grows beyond a threshold level that is large enough to allow economies of scale. Many studies, such as Root and Ahmed (1979), Schneider and Frey (1985), Wheeler and Mody (1992), and Tsai (1994), have empirically confirmed this hypothesis for developing countries.

Availability of skilled workers can significantly boost the international competitiveness of a host country. Hanson (1996), Root and Ahmed (1979), and Schneider and Frey (1985) found that the level of human capital, which is a good indicator of the availability of a skilled work force, is a significant determinant of the locational advantage of a host country and plays a key role in attracting FDI. Noorbakhsh et al. (2001) also found that human capital, which can also be a proxy for investment attractiveness, is a key determinant of FDI.

Among the other variables, Noorbakhsh et al (2001) found that FDI inflow responds positively to lagged changes in FDI, which can be used as a proxy for the level of familiarity foreign investors have about a particular country. Edwards (2000), Jaspersen et al (2000), and Asiedu (2002) found that the rate of return on investment positively affects the FDI inflow, while Edwards (1990) and Gastanaga et al (1998) found that trade openness also causes the same. Finally, Wheeler and Mody (1992), Loree and Guisinger (1995), and Asiedu (2002) found that availability (and quality) of infrastructure, a critical determinant of international competitiveness, significantly affects the FDI inflow.

Among recent studies of FDI in Mexico, Cuevas et al (2005) and Aroca and Maloney (2005) found that NAFTA has substantially boosted the FDI inflow to Mexico, however Quazi (2007) found that, accounting for the economic fundamentals, NAFTA has created an insignificant locational advantage for Mexico vis-à-vis other countries in Latin America. These apparently contradictory results can be reconciled by the fact that since other Latin American countries already belong to several trade blocks, such as MERCOSUR (Argentina, Brazil, Paraguay, and Uruguay), Andean Community (Bolivia, Colombia, Ecuador, Peru, and Venezuela), etc., they had been enjoying the fruits of free trade agreements long before Mexico was afforded the same by the creation of NAFTA.

This study makes three contributions to the FDI literature --first, it investigates the determinants of FDI in the sample countries, secondly, it examines the relationship between FDI and economic freedom, and thirdly, it analyzes foreign firms' perspectives about the host country investment climate.

THE ECONOMETRIC MODEL

The empirical models found in the FDI literature have typically included subsets of the following variables --incremental lagged changes in FDI (ΔFDI_{t-1}), economic freedom, trade openness, domestic market size, human capital, infrastructure, return on investment, political instability, etc. In the absence of a consistent theoretical framework to guide the empirical work, this study formulates the following general-to-specific model. Since the model is estimated with panel data (time-series data over 1995-2004 from a cross-section of nine countries), subscript *i* refers to countries and t refers to time.

$$FDI_{i,t} = \alpha + \beta_1 \Delta FDI_{i,t-1} + \beta_2 \text{Economic Freedom}_{i,t} + \beta_3 \text{Market Size}_{i,t} + \beta_4 \text{Human Capital}_{i,t} + \beta_5 \text{Infrastructure}_{i,t} + \beta_6 \text{Return on Investment}_{i,t} + \beta_7 \text{Trade Openness}_{i,t} + \varepsilon$$

Rationale of the Model

Lagged changes in FDI (ΔFDI_{t-1}): It is generally accepted that foreign investors are typically risk averse and tend to avoid unfamiliar territories. Therefore, it is extremely important for host countries to establish successful tracks of receiving FDI. Furthermore, many MNCs may test new markets by staggering their investment levels, which gradually reach the desired level after some time adjustments. The current level of FDI (FDI_t) should therefore be positively affected by the incremental lagged changes in FDI (ΔFDI_{t-1}).

Economic Freedom: The domestic investment climate plays a critical role in attracting foreign capital into host countries. However, the investment climate, which is determined by a host of economic and non-economic qualitative factors, is difficult to quantify. Since 1995, *The Heritage Foundation* and *The Wall Street Journal* have jointly published a reliable proxy for domestic investment climate --the annual Index of Economic Freedom (*EF*), which is defined as "the absence of government coercion or constraint on the production, distribution, or consumption of goods and services beyond the extent necessary for citizens to protect and maintain liberty itself" (Heritage Foundation, 2006; p. 56).

The *EF* index broadly reflects the extent to which an economy is pursuing free market principles. The index is constructed by incorporating 50 independent variables that constitute 10 broad categories --trade policy, fiscal burden of government, government intervention in the economy, monetary policy, capital flows and foreign investment, banking and finance, wages and prices, property rights, regulation, and black market activity. These factors are weighted equally in constructing a country's overall index score on a scale of 1 to 5. A score of 1 signifies a consistent set of policies most conducive to economic freedom, while a score of 5 signifies the contrary. Therefore, countries with lower *EF* scores should attract more FDI vis-à-vis countries with higher scores.

The *EF* index is constructed using several variables, such as monetary policy, banking, wages, etc., which have been frequently used in the literature as determinants of FDI. Since these variables are already captured by the *EF* index, it would be statistically inappropriate to include both the index and these variables as determinants of FDI, which could introduce multicollinearity in the model. Therefore, these variables have been excluded from this model.

Market Size: An important determinant of "market seeking" FDI, where the primary objective of MNCs is to serve the domestic market, is the market demand of MNC product in host countries. This type of FDI generally avoids poor countries, where consumers do not have adequate purchasing power. The average per capita annual income in the sample countries during the sample period was about US $3,270 (or $6,160 in terms of Purchasing Power Parity), which is not particularly high. However, it is possible that some FDI flowing particularly to the middle-income sample countries --Argentine (per capita income $7,460 or $11,890 in PPP) and Mexico ($5,580 or $8,520 in PPP), is "market seeking" in nature. Following the literature, this study uses per capita real GDP as a proxy for the domestic market size.

Human Capital: Although MNCs are often attracted to developing nations by the abundance of their cheap labor, the cost advantages can however be counterbalanced by their low labor productivity. Higher level of human capital is a good indicator of the availability of skilled workers, which, along with cheap labor, can significantly enhance the locational advantage of a host country. Following the literature, this study uses the adult literacy rate as a proxy for the level of human capital.

Infrastructure: Availability and quality of roads, highways, airports, seaports, electricity, telecommunication networks, etc. should increase productivity and thereby boost the locational advantage of a host country. This study uses the natural log of mobile phone connections per capita as a proxy for the availability of infrastructure. In addition to availability, reliability of infrastructure (such as the frequency of network outage) could also be a crucial indicator of the overall quality of infrastructure, for which data is not readily available for most countries in the sample.

Return on Investment: Higher rate of return on investment should attract higher levels of foreign capital into a host country. However, due to the absence of well-developed capital markets in most developing countries, measuring the rate of return on investment is difficult. Several studies, such as Edwards (1990) and Jaspersen et al. (2000), have proposed a solution to this problem --the inverse of per capita income in natural log can be used as a proxy for the return on investment. The rationale is that return on investment should be positively correlated with the marginal product of capital, which should be high in capital-scarce poor countries where per capita income is low (or the inverse of per capita income is high). Therefore, the inverse of per capita income should be positively related to FDI inflow. Following the literature, this study uses the natural log of inverse of per capita real GDP as a proxy for return on investment.

Trade Openness: Foreign investors typically have favorable impressions of countries that are open to international trade (for example, the Asian tigers). It should be noted here that since the end of the WWII and until the 1980s, Latin America had followed the lead of Mexico and Brazil to embrace the Import Substitution Industrialization (ISI) strategy that emphasized economic self-sufficiency and turned these countries inward. After more than three decades of economic disappointment, these countries abandoned the ISI strategy for Export Oriented Industrialization (EOI) strategy and turned themselves outward toward globalization. This change of economic philosophy should have positively affected the FDI inflow. Following the literature, trade openness is measured by the share of total volume of trade (exports plus imports) in GDP.

Although political instability is frequently found in the literature as a significant determinant of FDI, this study did not include this variable in the model. The reason is that the sample period used in this study is 1995-2004 --a period of relative political stability in the region.

DATA, METHODOLOGY AND ESTIMATION

The regression model is estimated using panel data from nine Latin American countries covering the period 1995-2004. Data for FDI (annual FDI inflow as a percentage of GDP), trade openness (volume of trade as a share of GDP), per capita income, per capita mobile phone connections, and adult literacy rate are collected from the *World Development Indicators* (World Bank, 2006), while data for economic freedom are collected from the *2006 Index of Economic Freedom* (Heritage Foundation, 2006). The timeframe covered by the dataset (1995-2004) was determined by the availability of data. The *EF* index is available only from 1995 and the *WDI CD-ROM 2006* reports annual FDI inflow until 2004.

The model has been estimated using panel regression methods. To ensure robustness of the estimated results, two widely used methods --Generalized Least Squares (GLS) and Random Effects, have been used. The estimated results, presented in Table 2, reveal that among the explanatory variables incremental lagged changes in FDI, economic freedom, infrastructure, return on investment, and trade openness turned out highly significant with the correct *a priori* signs. Only two explanatory variables -- market size and human capital, turned out statistically insignificant. As discussed before, the sample countries are not very wealthy, which perhaps makes their domestic markets unattractive for "market seeking" type of FDI. It is also plausible that the proxy variables used for market size and human capital --per capita income and adult literacy rates, are perhaps poor proxies for these variables. Nevertheless,

the overall diagnostic statistics appear satisfactory for each model. The White test for heteroscedasticity revealed signs of heteroscedasticity; therefore, the GLS model was estimated with heteroscedastic panels. It was also assumed that the panels had panel-specific autocorrelation parameters (estimation details are available from the author).

Table 2: Determinants of FDI in Sample Latin American Countries

Explanatory Variables	GLS Model		Random Effects Model	
	Coefficient	Z stat	Coefficient	Z stat
Intercept	25.77	13.76	28.76	4.88
ΔFDI_{t-1}	0.18	2.69**	0.43	4.45**
Economic Freedom	-1.02	-4.75**	-1.30	-1.90*
Infrastructure	0.34	3.66**	0.24	1.75*
Return on Investment	2.44	12.89**	2.60	4.29**
Trade Openness	0.01	4.63**	0.01	1.83*
Diagnostic Statistics	Sample size = 90		Sample size = 90	
	Log likelihood = -124.12		R^2 Overall = 0.44	
	Wald χ^2_5 = 202.42 (P value = 0.00)		Wald χ^2_5 = 42.83 (P value = 0.00)	

*** Coefficient is significant at 5% level of significance; * Coefficient is significant at 10% level of significance*

The estimated results confirm the *a priori* hypothesis that while FDI inflow is significantly boosted by incremental lagged changes in FDI, better infrastructure, higher return on investment, and greater trade openness, the inflow is also significantly depressed by lack of economic freedom. Although these results are generally consistent with the FDI literature, the result that economic freedom (or the lack of it) is a significant determinant of FDI deserves further analysis. The FDI literature has not yet fully addressed the importance of economic freedom (or investment climate), as quantitative data on investment climate was generally lacking until the *Economic Freedom Index* became available in 1995. Therefore, it is important to adequately analyze the relationship between FDI and economic freedom (and the 10 independent variables that constitute the index).

As mentioned before, the *Economic Freedom Index* is constructed by incorporating 10 broad categories, which in turn are constructed by 50 independent variables. Table 1A in the Appendix section lists the disaggregated broad categories and their underlying independent variables. According to the methodologies discussed in *2006 Index of Economic Freedom* (Heritage Foundation, 2006), each one of the 50 underlying variables is evaluated annually to reflect the institutional environment in each country. Based on the individual score of each underlying variable (which is not reported by the publication), the 10 disaggregated categories are graded on a scale of 1 to 5, where a lower score signifies policies conducive to economic freedom, and conversely a higher score signifies the contrary. Since this study found that lack of economic freedom significantly depresses FDI, it is rational to hypothesize that similar negative relationships should be found between most of the individual disaggregated categories of the index and FDI inflow (a higher score is reflective of worse policy setting, which should result in reduced FDI inflow). To test the hypothesis, a pair-wise correlation matrix was computed, which is presented in Table 3 below.

Table 3: Pair-wise Correlation between FDI and Categories of EF Index

Disaggregated Categories of EF Index	Correlation Coefficient with FDI	Significance of Coefficient
Trade Policy	-0.22	0.03**
Fiscal Burden of Government	-0.25	0.02**
Govt. Intervention in the Economy	0.13	0.22
Monetary Policy	-0.12	0.27
Capital Flows & Foreign Investment	-0.22	0.03**
Banking and Finance	-0.27	0.01**
Wages and Prices	-0.27	0.01**
Property Rights	0.03	0.79
Regulation	0.18	0.09*
Informal Market Activity	0.19	0.07*

*** Coefficient is significant at 5% level of significance; * Coefficient is significant at 10% level of significance*

The correlation matrix presented in Table 3 reveal that the correlation coefficients between FDI inflow and 6 out of the 10 disaggregated categories have the correct *a priori* negative signs and 7 out of 10 categories are statistically significant (albeit with wrong signs for 2 coefficients, which is reconciled below). As expected, FDI inflow is negatively correlated with policy changes that result in higher trade barriers (category - trade policy), more repressive taxation (category - fiscal burden of the government), more restrictive foreign investment code (category - capital flows and foreign investment), more repressive financial system (category - banking and finance), and further price and wage controls (category - wages and prices).

No significant correlation was found in this study between FDI inflow and three categories --government intervention, inflation, and property rights, which perhaps is idiosyncratic of this particular sample. However, there seems to be a simple explanation of the apparently puzzling result --the significantly positive correlation found between FDI inflow and more repressive regulation and informal markets. Besides Argentina and Mexico (which have a combined average score of 3.05 for regulation category and 2.93 for informal market category), the other seven countries in the sample are heavily regulated (average score is 3.56) and have significant economic activities in informal markets (average score is 3.84); however, these seven countries have also received far more FDI inflow (average FDI/GDP ratio over the sample period is 4.5%) vis-à-vis Argentina and Mexico (average FDI/GDP ratio is 2.93%), which is what the statistically positive correlation coefficients have captured. Evidently, these seven countries have scored better in other *EF* categories to compensate for the loss in the above two categories. Furthermore, their combined average *EF* index (2.76) is better than the combined average index for Argentina and Mexico (2.89), which explains why the seven countries' overall investment climate is more conducive to attracting FDI.

INVESTMENT CLIMATE: FOREIGN FIRMS' PERSPECTIVES

This section analyzes the sample countries' investment climate from foreign firms' perspectives and attempts to identify a few factors that have created locational disadvantage for Mexico vis-à-vis the other eight countries as FDI destinations. It should be noted here again (from Table 1) that the average FDI/GDP ratio for each one of these eight sample countries is higher than that of Mexico. The dataset used in this section is published by the Enterprise Analysis unit of the World Bank (*Enterprise Surveys* data), which captures over 150 business environment indicators, based on surveys of more than 58,000 firms in 91 countries.

The nature and scope of this survey is described on the Enterprise Surveys website as: "The Enterprise Surveys capture business perceptions on the biggest obstacles to enterprise growth, the relative importance of various constraints to increasing employment and productivity, and the effects of a country's investment climate on its international competitiveness" (Enterprise Surveys, 2007). The core survey is organized into two parts --the first part seeks managers' opinions on the main constraints in the business environment, and the second part focuses on productivity measures. Although the *Enterprise Surveys* data are presented for both domestic and foreign firms, since the focus of this study is analyzing factors relevant to FDI, this section uses data from only foreign firms. Table 4 below shows two important factors --bureaucracy and financial markets, where foreign firms based in Mexico have responded more unfavorably vis-à-vis foreign firms based in the other countries (labeled as "Rivals").

The first section of Table 4 shows that foreign firms in Mexico spend significantly more senior management time, vis-à-vis foreign firms in rival countries, in dealing with requirements of government regulation and the regulatory climate in Mexico is perceived to be more uncertain vis-à-vis the rival countries. Since dealing with excessive bureaucracy and an uncertain regulatory climate can consume a large amount of time and resources, these negative perceptions are not conducive to attracting FDI to Mexico. These perceptions are consistent with the *EF* score for Mexico in the regulation category (average score over the sample period is 3.80) vis-à-vis the combined average score for the rival countries (3.40). Therefore, data from two independent sources --*EF Index* and *Enterprise Survey* data, seem to suggest that an important pre-condition for Mexico to attract more foreign investment is to improve its regulatory environment.

Table 4: Factors Creating Locational Disadvantages for Mexico

Excessive Bureaucracy	**Rivals**	**Mexico**
Senior management time spent in dealing with requirements of government regulation (%)	13.03	19.23
Consistency/predictability of officials' interpretations of regulations affecting the firm	44.13	40.16
Underdeveloped Financial Markets	**Rivals**	**Mexico**
Internal financing (%)	56.61	80
Bank financing (%)	18.68	0.84
Supplier credit financing (%)	13.35	17.48
Equity, sale of stock for financing (%)	2.89	0
Internal finance for investment (%)	60.80	69.38
Bank finance for investment (%)	18.93	5.5
Supplier credit finance for investment (%)	6.35	16.13
Equity, sale of stock for investment (%)	5.01	0

A recent study by the U.S. Department of State (2007) also found that, according to foreign investors, bureaucracy, slow government decision-making, and lack of transparency, among other factors, are the main obstacles to investment in Mexico. The study also noted that Mexico has made some progress in recent year in improving its regulatory environment. For example, the *Comisión Federal de Mejora Regulatoria (COFEMER)*, or Federal Regulatory Improvement Commission has removed almost 50% of the information, registration, and permit requirements imposed on businesses by 11 federal government ministries and simplified 90% of the remaining requirements. To improve transparency of current processes, *COFEMER* has further compiled all business formalities in the Federal Registry of Business Formalities and made it available online. The Secretariat of Public Administration has set up several internet sites to improve transparency of government decision-making. Among these sites, *"Normateca"* provides information on government regulations, *"Compranet"* permits online government procurements,

and *"Tramitanet"* allows electronic processing of government transactions, which reduces the risk for bribes (Ibid). These regulatory improvements should help boost Mexico's long-run FDI prospects.

The second section of Table 4 shows that for financing and investment purposes, foreign firms in Mexico rely much more on their internal resources and supplier credit, and much less on the financial markets (banks, stock market, etc.) than in rival countries. Since foreign firms find access to efficient financial markets lagging in Mexico, this can create a negative perception not conducive to attracting FDI. Again, these perceptions are consistent with the *EF* score for Mexico in the banking & finance category (3.30) vis-à-vis the combined average score for the rival countries (2.48). Furthermore, one of the underlying variables for the capital flows & foreign investment category was availability of local financing for foreign companies, which is essentially what theses figures show in Table 4. The *EF* score in this category for Mexico is 2.40 --worse than the average score for the rivals (2.15), which is consistent with the figures in Table 4.

The current inefficiencies in the Mexican financial sector can be partially traced back to the peso crisis of 1994 (also called the *Tequila* crisis). Caused by a combination of overvalued fixed exchange rate, non-independent Central Bank, weak financial regulation, and political crisis, the massive peso devaluation wrecked havoc in the financial sector whose crippling aftershocks could be felt for years. Since the crisis, Mexico has introduced many financial reforms that are gradually restoring financial stability. These reforms, together with sound macroeconomic fundamentals, should eventually bring about a sound financial sector and capital market in Mexico (U.S. Department of State, 2007).

Since the passage of NAFTA, many U.S. and Canadian firms have entered the Mexican financial services market. For example, the U.S. banking giant Citigroup has acquired *Banamex* and Canada's Scotia Bank has acquired *Inverlat*. Another country that has a significant presence in the Mexican capital market is Spain, whose *BBVA* (*Banco Bilbao Vizcaya*) has acquired *Bancomer*, reputed to be the most prestigious of Mexico's banks. These foreign banks through their Mexican subsidiaries control over 80 percent of the banking system, which should contribute positively to the long-term prospect of the banking sector. Not only the patronage of these foreign banks should provide Mexican banks with much greater access to capital than before, but also close collaboration with foreign banks should improve the banking system's risk management techniques, such as standards in auditing, disclosures, etc. (U.S. Department of State, 2007). It appears that the Mexican banking system is on track to catch up with its regional rivals.

Despite the presence of two factors identified above that are not conducive to attracting FDI, Mexico does host quite a few factors that are very much favorable to FDI. Table 5 below shows that, compared with foreign firms in rival countries, foreign firms in Mexico believe they face lower corruption, lower crime-related costs, and more efficient tax and trade regimes.

Table 5: Factors Creating Locational Advantage for Mexico

Corruption	**Rivals**	**Mexico**
Unofficial payments for typical firm to get things done (% of sales)	1.09	0.19
Firms expected to give gifts in meetings with tax inspectors (%)	5.66	2.86
Value of gift expected to secure government contract (% of contract)	2.06	0.25
Pays Bribes to get things done (% firms)	27.63	14.16
Crime	**Rivals**	**Mexico**
Security costs (% of sales)	3.33	2.31
Losses due to theft, robbery, vandalism, and arson against the firm (% of sales)	0.25	0.20

Table 5: Factors Creating Locational Advantage for Mexico (Continued)

Tax	**Rivals**	***Mexico***
Average time firms spent in meetings with tax officials (days)	4.76	*1.78*
Trade	**Rivals**	**Mexico**
Average time to clear direct exports through customs (days)	4.95	3.24
Longest time to clear direct exports through customs (days)	9.88	5.7
Average time to claim imports from customs (days)	10.14	8.08
Longest time to claim imports from customs (days)	23.29	12.88

CONCLUSIONS

Since the early 1980s, developing countries around the world have embraced globalization and opened up to FDI. Among the developing regions, Latin America, perhaps due to its geographical proximity to the US and Japan, has become a prime destination of FDI. Among the countries in Latin America, Mexico, due to its membership in NAFTA, has now become one of the most important destinations of FDI in the world. There are however eight other countries in the region --Argentina, Bolivia, Brazil, Costa Rica, Ecuador, Nicaragua, Panama, and Peru, that robustly compete with Mexico as attractive FDI destinations. Over 1995-2004, the average ratio of FDI inflow to GDP for each one of these eight countries was higher than that of Mexico. For this sample of nine countries, this study econometrically estimates the determinants of FDI, examines the relationship between FDI and economic freedom, and analyzes the host country investment climate from foreign firms' perspectives.

Using panel data from nine countries over 1995-2004, two panel regression models (GLS and random effects) were estimated. The estimated results show that FDI inflow is significantly boosted by foreign investors' increased familiarity with the host economy, better infrastructure, higher return on investment, and greater trade openness, but the inflow is significantly depressed by lack of economic freedom. Further analyzing the relationship between FDI and *Economic Freedom Index* (published by the Heritage Foundation), this study finds that FDI inflow is negatively correlated with policy changes that result in higher trade barriers, more repressive taxation, more restrictive foreign investment code, more repressive financial system, and further price and wage controls.

Finally, utilizing *Enterprise Surveys* data (published by the World Bank), this study analyzed foreign firms' perspectives about investment climate in the sample countries. The results reveal two hurdles for Mexico --excessive bureaucracy and inefficient financial markets, which possibly hinder its efforts to attract FDI. The country has however made significant strides in recent years to streamline bureaucracy and strengthen capital markets, which bodes well for its long-term prospects. The results also show that, compared with foreign firms in rival countries, foreign firms in Mexico face lower corruption, lower crime-related costs, and more efficient tax and trade regimes.

The results from this study further our knowledge of the factors that drive the flow of FDI, which is crucial for devising strategies to promote economic development --a course that holds much at stake not only for Mexico and Latin America, but also for developing countries in general.

APPENDIX

Table 1A: Categories and Underlying Variables of Economic Freedom Index

Broad Categories	Underlying Variables
1. Trade policy	• Weighted average tariff rate • Non-tariff barriers • Corruption in the customs service
2. Fiscal Burden of Government	• Top marginal income tax rate • Top marginal corporate tax rate • Year-to-year change in government expenditures as a percent of GDP
3. Government Intervention in the Economy	• Government consumption as a percentage of the economy • Government ownership of businesses and industries • Share of government revenues from state owned enterprises and government ownership of property • Economic output produced by the government
4. Monetary policy	• Weighted average inflation rate from 1995 to 2004
5. Capital Flows and Foreign Investment	• Foreign investment code • Restrictions on foreign ownership of business • Restrictions on industries and companies open to foreign investors • Restrictions and performance requirements on foreign companies • Foreign ownership of land • Equal treatment under the law for both foreign and domestic companies • Restrictions on repatriation of earnings • Restrictions on capital transactions • Availability of local financing for foreign companies
6. Banking and Finance	• Government ownership of financial institutions • Restrictions on the ability of foreign banks to open branches and subsidiaries • Government influence over the allocation of credit • Government regulations that inhibit financial activity • Freedom to offer all types of financial services, securities, and insurance policies
7. Wages and Prices	• Minimum wage laws • Freedom to set prices privately without government influence • Government price controls • Extent to which government price controls are used • Government subsidies to businesses that affect prices
8. Property Rights	• Freedom from government influence over the judicial system • Commercial code defining contracts • Sanctioning of foreign arbitration of contract disputes • Government expropriation of property • Corruption within the judiciary • Delays in receiving judicial decisions and/or enforcement • Legally granted and protected private property
9. Regulation	• Licensing requirements to operate a business • Ease of obtaining a business license • Corruption within the bureaucracy • Labor regulations, such as established workweeks, paid vacations, and parental leave, as well as selected labor regulations • Environmental, consumer safety, and worker health regulations • Regulations that impose a burden on business
10. Informal Market Activity	• Smuggling • Piracy of intellectual property in the informal market • Agricultural production supplied on the informal market • Manufacturing supplied on the informal market • Services supplied on the informal market • Transportation supplied on the informal market • Labor supplied on the informal market

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THE SELECTION OF THE DISCOUNT RATE IN ESTIMATING LOSS GIVEN DEFAULT

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ABSTRACT

Loss Given Default (henceforth the LGD) is the ratio of losses to exposure at default. It includes the loss of principal, the carrying costs of non-performing loans and workout expenses. In light of the management and regulatory advances regarding LGD, this paper addresses the topic of choosing the proper rate to estimate the current value of recoveries. By means of a review of the available literature on LGD, the impacts of different solutions for the discount rate (contractual rate, risk-free rate and single-factor approaches) on the variability of LGD are analyzed and compared. In order to understand the influence of market constraints from both the static and dynamic standpoints, the paper studies the methodologies for the selection of the discount rate. Considering the limitations of the approaches found in both academic and operational literature, the paper proposes a multi-factor model to measure the discount rate based on systemic and specific factors. These factors, in light of the aggregate empirical evidence, can serve as explanations for the variability of LGD.

INTRODUCTION

When a debtor enters into the state of insolvency, the lender changes his primary approach from that of debtor to collector. The goal becomes to initiate the set of activities that will originate the maximum positive cash flows in the recovery process. The Loss Given Default (henceforth the LGD) is the amount of losses in the case of default and it represents an important management variable for any financial intermediary (Carey, 1998). It takes on importance for accounting, regulations and management purposes. LGD has an important role in determining the amortized cost of the credits in the balance sheet (Giordano and Lionetti, 2005).

In the New Agreement on Capital, the Basel Committee (henceforth, the Committee) provides that the minimum assets be determined through the following parameters: probability of default (henceforth, PD), loss given default (LGD), exposure at the time of default (henceforth, EAD) and the maturity (henceforth, M) (Basel Committee on Banking Supervision, 2005b). The LGD represents the component of proportional risk relative to the minimum capital requirement. For intermediaries adopting the advanced approach under the internal ratings method (henceforth, IRB method), the in-house estimate of LGD permits, *ceteris paribus*, a significant advance in the alignment of capital for regulatory purposes relative to economic capital (Schuermann, 2004).

LGD constitutes an important instrument for measuring the efficacy and the efficiency of the recovery process. The analysis of the relationship between contract characteristics and the level of the LGD turns out to be relevant for the definition of leading criteria in the selection of the technical forms and in the identification of suitable guarantees (Sironi, 2005). Assuming the estimate of LGD based on in-house data available, it is necessary to identify and to select a discount rate consistent with the changed risk faced by the creditor at the time of insolvency.

The recent developments in the international literature on LGD bring out its nature as a random variable and the influence of systematic variables on it. Empirical studies have demonstrated that the variability of LGD is related to not only the economic cycle but also the economic sector and the average recovery time. The removal of these assumptions constitutes a critical aspect for the selection of the discount rate,

which must be assumed in order to evaluate the yield of the investment during the recovery process (Basel Committee on Banking Supervision, 2005).

This paper starts by presenting a review of the literature on estimating the LGD. Specifically, we focus our attention on choices regarding the discounting of financial flows associated with the change in the statistical properties of the LGD and on the risk profile of the investment, before and after default (section 2). In order to understand the external influences on the selection of the discount rate on the in-house management of risk, the paper also analyzes the indications in the area of accounting and prudential standards both statically and dynamically, and discusses their implications for the purposes of determining the LGD according to an economic approach (section 2.1). The evaluator may choose among various acceptable rates on the basis of the constraints exerted by the laws in force and of the aims pursued with the analysis. With the purpose of delineating criteria for choosing among the possible alternatives, the characteristics and the limitations of the individual approaches are examined (section 2.2). In light of the approaches taken in the literature, this paper presents an alternative model for determining the discount rate, (section 3).

LITERATURE REVIEW

Analysis of the literature on recovery risk has been of increasing interest to academics, especially over the past few years. Of particular interest are the factors that influence LGD and the most correct methods for measuring it. The contributions proposed thus far do not identify an optimal solution for its analysis. This results in the need to select, case by case, the methodology most suited to the characteristics of the exposure in default (Basel Committee on Banking Supervision, 2005).

Study of the recovery processes carried out, even in countries having more evolved financial markets usually brings out a recovered value lower than the starting exposure, so that the role played in the determination of the overall risk of the financing operation by the LGD can not be deemed marginal (Covitz and Han, 2004). The factors influencing LGD can be classified into four macro categories (Grunert e Weber, 2005):

- debtor characteristics;
- aspects regarding the relationship;
- distinctive elements of the contract;
- macroeconomic factors.

The amount the recovery can be correlated with the debtor characteristics. The aspects most influencing them may be identified in the legal form, the dimension, the business carried on and the location of the company headquarters. In the case of a limited-liability or a joint-stock company, the intermediary can has recourse only against the company. As the level of indebtedness rises the probability that all loans will be paid in bankruptcy falls (Carey and Gordy, 2005). Companies of larger size, furthermore, can be *ex-post* riskier because the intermediary usually prefers not to immediately start up the recovery process and is more inclined to grant extensions or renegotiations of the debt (Carty and Lieberman, 1996). The business carried on (Acharya, Bharath, Srinivasan, 2003) may, furthermore, influence the company balance-sheet characteristics, determining a larger or smaller presence of tangible or intangible assets, a different level of indebtedness and a different degree of liquidability of the assets (Izvorski 1997) and involve, as a consequence, greater or lesser difficulty in starting the recovery procedure. The location of the company headquarters, finally, can influence the value of the recovery due to the nature of foreign laws (Davydenko e Franks, 2004); moreover empirical evidence shows that, within a country, application to a particular court can bring about a different duration and/or efficacy of the suit in question (Bank of Italy 2001).

LGD is negatively correlated with the degree of interrelationship between intermediary and customer and with the duration of the relationship. As economic importance increases and as duration of the relationship increases, the probability increases that the debtor does not honor the engagements taken on. This occurs because it will be hard to find other operators who will offer him credit under the same conditions (Berger and Undell, 1995). Making customers more faithful thus represents a factor mitigating LGD because as the information availability increases, the risk of mistaken customer evaluations drops (Longhofer and Santos, 1999).

The recovery rate is not independent of the characteristics of the relationship. A non-marginal role is played by the customer's assets situation, by the repayment procedures and by any guarantees on the relationship (Gupton, Gates and Carty). The capital structure of the debtor is significant because the eventual recovered value is negatively correlated with the amount (Van de Castle and Keisman, 1999) and the complexity (Hamilton and Carthy, 1999) of the debt already contracted by the counterparties. Contract clauses can limit the intermediary's exposure or the speed of the recovery process (Singh, 2003). The debt repayment procedures are the principal factor that can influence the EAD in any particular relationship. Operations calling for non-progressive repayments have a greater probability of resulting in low recovery rates. Finally, the efficacy and duration of the recovery process are influenced by the presence of any contractual guarantees (Altman and Kishore, 1996) and by the possibility of identifying and claiming the insolvent debtor's assets (Eberhart, Moore and Roenfeldt, 1990).

The value of the recoveries in any financial operation depends on the intermediary's capacity to obtain debt payments from the company or in case of business failure, to sell the company's assets to obtain the cash flows needed to meet the debt obligations (Palmieri, 2004). International market analyses suggests a negative correlation between the behavior of LGD and the business sector's economic cycle (Hu and Perraudin, 2002), meaning that the efficacy of a recovery process is not independent of the behavior of the economy in general (Truck, Harpainter and Rachev, 2005) and of the market in particular (Acharya, Bharath and Srinivasan, 2005). During an economic downturn, the recovery process is, in fact, less effective since, other conditions being equal, the cash flows available to the company reduce as the demand for goods or services falls (Frye, 2000) and the sell-off value of a company's assets decreases with the level of demand in the market in which it operates (Izvorsky, 1997).

The definition of the value of the LGD may be taken on by using different approaches, based on market data or in-house data, which can be classified in three macro categories (Schuermann, 2001): market LGD, implied market LGD and work-out LGD.

One of the most important differences is that the first two approaches assume an efficient market (Altman, 2006). Expectations of LGD are reflected in market prices, but other factors play a relevant role in the determination of ultimate losses (Carey and Gordy, 2005). International analyses have identified difficulties in estimating LGD with such approaches, especially for companies of smaller size that are not publicly traded (Araten, et al. 2004). The lack of market data necessitates use of the work-out approach for evaluating the intermediaries' credits portfolio. Moreover if the bank's policy is to work out the defaulted assets, as normally Italian banks do, LGD estimation needs to be based on discounted workout recoveries (Brady, Chang, Miu, Ozdemir and Schwartz, 2006) .

Regulatory Constraints Preceding the Basel 2 and IAS-IFRS Perspectives

LGD represents one of the components determining the variability of loss that the financial intermediary faces in the case of the counterpart's insolvency. In relation to the development of measurement methodologies, the new accounting and prudential standards require an explicit treatment for this variable notwithstanding the current primary (d.lgs 87/92) and secondary regulations on making up the individual

balance sheet (Bank of Italy, 1999). Among the aspects dealt with during the development of prudential and accounting standards, special attention is given to selection of the discount rate.

Prior to the implementation of the Basel 2 and IAS- IFRS frameworks, there was an implicit treatment of the LGD. From an individual accounting standpoint, before IAS-IFRS implementation, financial intermediaries must determine the presumable redemption value as the face value net the presumable loss at the bank due to the default (Cavalieri, 1995). Before Basel 2 the prudential regulation envisaged already standard risk weights to calculate the minimum capital requirements. This approached gave a more favorable treatment to the real estate exposure due to the positive impact of collateral on the recovery rate in the case of debtor's default (bank of Italy, 1988).

Those financial intermediaries, who intend to adopt the advanced approach envisaged by the method based on internal ratings (IRB), in order to use in-house estimates of the assets absorption, must comply with the minimum operating requisites envisaged by the New Agreement. Regarding these minimum operating requisites, the Committee deals with the topic of variability of LGD as it relates to the internal rating system and the quantification of LGD (Basel Committee on Banking Supervision, 2005).

With regard to the concept of the internal rating system, the Committee envisages that in rating a transaction, financial intermediaries must consider at least the following segmentation variables (De Laurentis, 2001):

a) the type of guaranty;
b) the type of operation;
c) the economic sector;
d) the purpose of the operation.

With regard to quantifying LGD, the Committee pays especial attention to its variability originating from the behavior of the economic cycle. Although utilized in the determination of capital requirements, LGD is not conditioned by determinations of the systemic risk factor (Gordy, 2003). In the rules for estimating the LGD the Committee introduces:

a) the forecast of the measure of the risk driver under conditions of economic downturn;
b) the imposition of a minimum value, equal to the long-term mean of the losses in case of insolvency, which mean is weighted for the defaults;
c) the upgrading of LGD of the exposures in default to incorporate the unexpected losses *ex ante*.

The Committee prudentially treats the event of economic downturn and its consequences on the LGD. The losses can exceed the average amount owed to the deterioration of the encashment values of the guarantees. Therefore, the Committee envisages that the financial intermediary, to take account of these possible scenarios, raise the value of the LGD over the average level.

The Committee's recommendations on the determinants of LGD and on the possible random nature of LGD have also been used to determine the discount rate (Basel Committee on Banking Supervision, 2005b). In particular, the Committee envisages that the financial flows, relative to the recoveries and to the costs sustained, must be discounted according to a rate consistent with an investment that possesses the following qualities:

- its amount equals the EAD;
- the time horizon is equal to the time interval that runs between the classification of the counterpart in default and the end of the recovery process;

- if relevant, the non-diversifiable risk must find a suitable coverage in the spread relative to the risk-free rate.

To adopt compliant solutions relative to the principle set forth and in harmony with other market constraints, according to the Committee financial intermediaries may resort to:

a) a discount rate suited to the recovery risk faced during the exposure period;
b) a conversion into certain equivalents of the flows from the recovered sums encashed and from the costs sustained;
c) an adjustment both of the discount rate and of the recovery flows and of the costs in harmony with the principle set forth.

It is believed that alternative sub a) best responds to the requisites envisaged by section 468 of the New Accord and, therefore, is suited to calculating a measurement of the LGD that reflects the economic loss faced by the financial intermediary. The Committee does not however indicate the model to be adopted for determining the discount rate. The absence of a prescriptive criterion depends on both the aim of aligning the capital for surveillance purposes to the economic capital and on the modest advance in the techniques of validation of the LGD (Pomante 2005).

As for alternative sub b), the Committee suggests use of the discount rate the risk-free rate only after having converted the incoming and outgoing financial flows into certain equivalents. This conversion is to be done through the application of conversion coefficients that take account of the influence of idiosyncratic and macroeconomic factors (Basel Committee on Banking Supervision, 2005c). From the interpretive standpoint, although this alternative is in line with the new accounting standards, the discount rate would not represent the yield of the financial intermediary's post-default exposure. Rather it represents the financial value to be compared with alternative investment opportunities.

The selection of the discount rate for determining the loss that the financial intermediary records when the counterpart's credit merit is impaired (impairment) is one of the central aspects of IAS 39 (International Accounting Standards Committee, 2003) for financial assets classified in the Loans and Receivables category. Setting aside the typology of the credit evaluation, whether analytic or collective, the financial intermediary must determine the loss as the difference between the amortized cost (Faraci, 2005) and the current value of the financial flows that he will encash during the recovery process. To determine the current value of the financial flows, the accounting standard envisages that the intermediary use the effective original rate (law 363/I of December 19, 2004, section 9 of the attachment).

Through the application of the original effective rate at the discovery of the impairment, the intermediary achieves the effective loss characterizing the credit exposure at the time of its evaluation. The evaluation methodology implies:

- coinciding the time horizon with the due date of the exposure and therefore neutrality relative to alternative forms of investment of the economic capital and
- the coinciding of the yield of the financial operation before and after default (Arnaboldi and Saita, 2005).

With regard to neutrality to alternative investments, once the financial intermediary has taken note of the counterpart's impairment, it can decide to terminate the relationship. In this case, the evaluation will also depend on the investment alternatives for the allocation of the capital. Therefore, the counterparty having a yield no longer available on the market could modify his choice.

The characteristics of the intermediary's investment undergo a change after the appearance of the counterpart's impairment. Furthermore, the risk of financial flows *ex-ante* impairment is different from the risk involved in the systemic and idiosyncratic factors that influence the risk of the financial flows *post* impairment. Should the financial intermediary decide to go ahead with restructuring the financing, presumably my modifying the contract in the creditor's favor, the discount rate to be applied would remain the original one.

The suitability of the effective original rate for determining the LGD according to an economic approach is relevant in light of:

1) the absence of consideration of the costs sustained by the financial intermediary in the recovery process. Such consideration is a fundamental element in order to use the accounting dimension of the loss;
2) the inclusion of the late interest among the post-impairment flows (ABI, 2002 and Dabbene, 2005), calculated using a different rate from that of the discounting of the expected financial flows;
3) the adjustment of the expected flows only when the loss has become manifest.

In light of the properties of the methodology of calculation of the loss after impairment has appeared, and, more generally, in light of the purposes of the new accounting framework (Lanotte, 2005 and Mariniello, 2004), the original effective rate is not deemed adequate for the determination of LGD in economic values. In particular, like any contract rate, it does not permit evaluating the effectiveness of the financial intermediary's recovery activities in respect to the market yield.

Choices of Discount Rate for the Estimates of the LGD Made According to the Work-out Approach

The use of the work-out approach offers the possibility of obtaining more accurate estimates for the evaluation of loans granted by Italian financial intermediaries. However it demands the availability of very detailed information sets and makes it necessary to select the proper rate for discounting future flows (Frye J., 2004). An examination of the literature reveals the presence of different useable discount rates. The rates proposed are:

- the contract rate applied to the customer;
- the risk-free rate;
- the correct yield rate, estimated using a single-factor approach.

In the course of this section, the three approaches are examined in detail. Their principal characteristics and their limitations are considered along with the importance of selecting the correct rate for discounting the flows tied to the recovery process. The contractual loan rate approach requires that the flows recovered by the intermediary, after the state of insolvency is discovered, be discounted at the contract rate defined at the start of the relationship or at the last contractual rate renegotiated with the customer. Adoption of this approach can be deemed reasonable only if it is believed that the opportunity cost of the missing recovery of the sums at contract due date be correctly identified by this rate. This approach assumes that the insolvency event does not modify the risk of the operation.

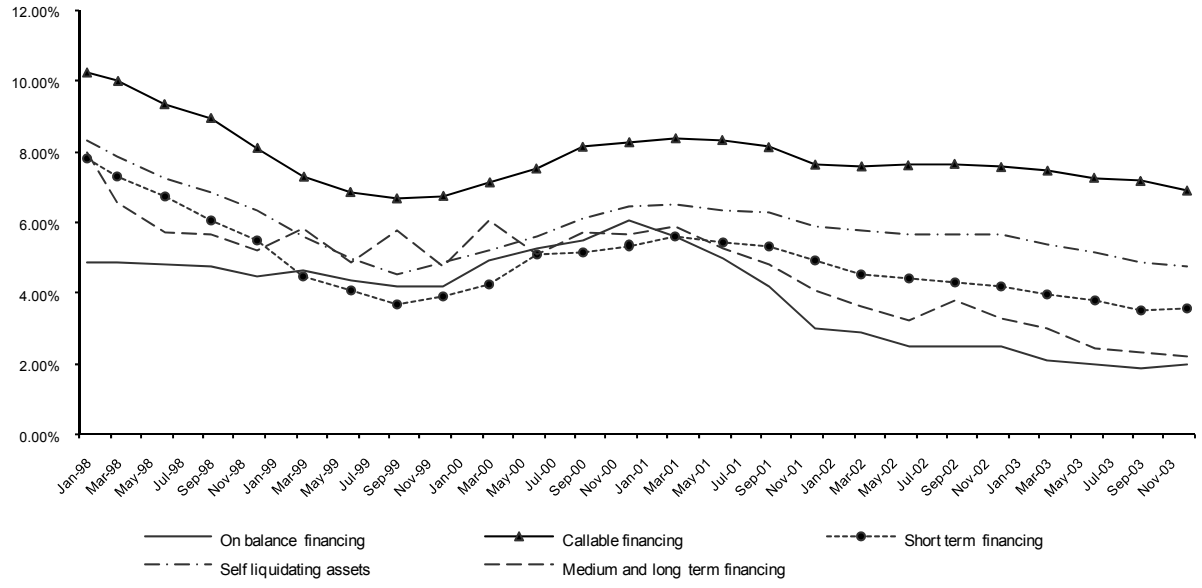
The contractual rate approach makes it necessary to gather a complete internal information set since any differences in the contracts stipulated have significant repercussions on the capacity to renegotiate the rates and, therefore, on their time development. The choice of using mean or aggregate rates does not represent a reasonable solution for estimating the LGD with this approach and a complex information

database has to be constructed. This information database is constructed from the internal data gathered by the intermediary (Asarnow and Edwards, 1995).

A simple analysis of the behavior of the rates negotiated by type of financing granted demonstrates that the choice to use aggregate rates for the Italian reality is problematic. (see Figure 1). The trend underlying the behavior of the individual rates is similar, but significant differences are present in the interest rate levels during the individual period considered and in their behavior on time horizons shorter than one year.

The constraint of using only the specific rates in these approaches limits the evaluator to choosing the reference date for the rate used. The evaluator can select the initial contractual rate or last renegotiated contract rate. In the choice between the two solutions, a determining factor is the contract stipulation date. The higher the lag between contract signing date and the date of flows encashment, the less significant the use of the starting rate as the discount factor due to changes in economic conditions.

Figure 1: The Behavior of Contract Rates by Typology of Operation



This figure plots the trend of interest rates for different types of lending. Data are collected from the Bank of Italy official database.

The significance of the result obtained using this approach will diminish, other things being equal, with the increase in the time lag between the contractual rate reference date and the dates of the recovery flows, as it will diminish with an increase in repayment frequency. A recovery process that envisages frequent flows makes it hard to apply the contractual rate methodology because the rate used for discounting is fixed over the entire life of the contract. The application of a constant rate does not represent a correct solution if the time horizon of the rate calculation does not coincide with the time horizon of the discount (Dallocchio and Salvi, 2004) and, especially for long recovery processes, the probability that the life of the contract will not coincide with the discount interval becomes high.

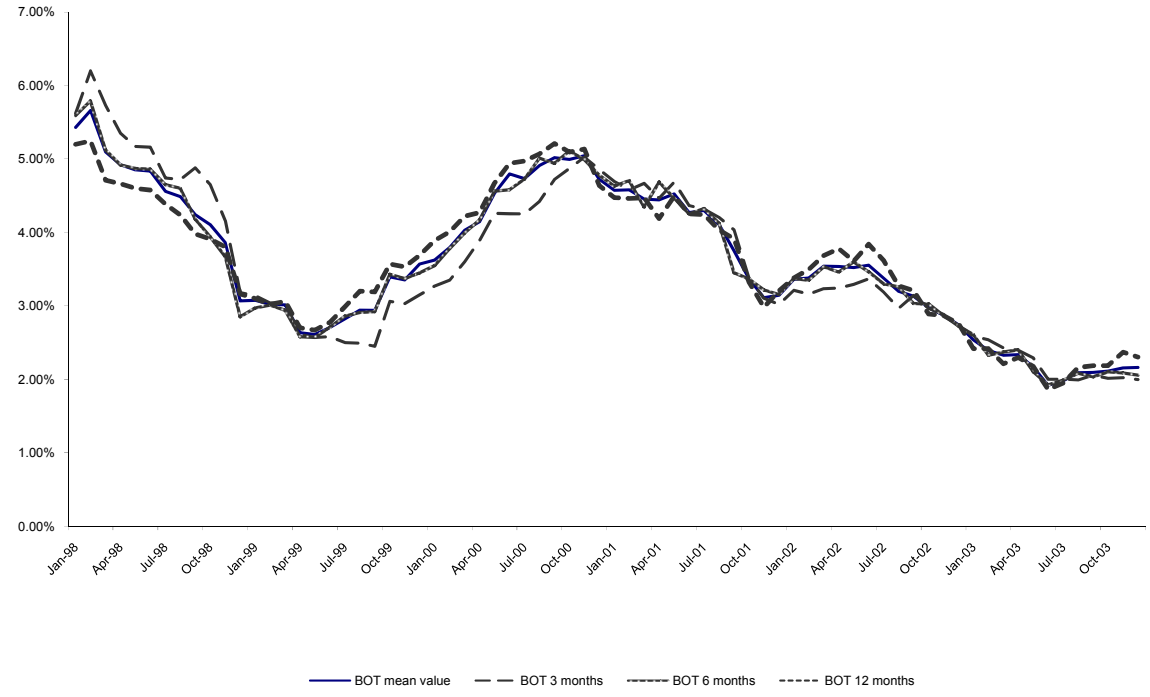
The current value of the flows tied to financing paid out can be estimated by considering the mean market rates for investment operations having lives similar to the operation considered. The difficulties in identifying this rate can push the intermediary to choose to use the minimum opportunity cost for the time deferment of the repayments: the risk-free rate. The applicability of this approach is, then subordinate

only to the identification of the reference market, and of the best proxy available for the risk-free activity yield (Unal, Madan and Guntay, 2003.).

Analysis of the risk free rates for the Italian market can be carried out under the assumption of the presence of insignificant default risk for sovereign states not classified as developing countries (Damodaran, 1999). The behavior of the securities issued by the Italian state having due dates lower than twelve months should be examined (see Figure 2).

The behavior of yield rates for the different types of Treasury bills considered brings out a substantial uniformity in the trend and in the levels of yield paid out, especially over the past few years of the period considered. The choice of the risk-free rate suited to the different due dates of the flows should not excessively influence the estimate of the LGD since the anomalies in the trend for the period of the rates for bonds for different due dates are only temporary and do not persist.

Figure 2: The Behavior of Risk-Free Rates for Different Due Dates



This figure plots the trend of risk free rates for different durations. Data collected from Datastream.

The default event suggests the possibility of foreseeing *ex ante* the amounts and the dates of the revocery cash flows. As such it brings about an increase in the risk of variability of the repayment flows tied to the financing paid out. Even under the assumption that the risk-free rate represents a correct value for discounting future flows coming in for the intermediary before the appearance of the default, it is hard to believe that the use of this rate is correct also when the flows lose their characteristic of certainty. The decision to estimate the LGD with the risk-free rate approach can result in underestimation because the current value of the flows generated by the recovery process would be computed without considering the greater degree of uncertainty that characterizes the recovery flows.

The use of a risk-free rate can lead to underestimating the loss in case of insolvency since it is likely that there is a non-zero risk of loss. A more credible solution envisages the use of a discount rate corrected for the estimated risk (Maclachlan, 2004) by using a model having a formulation similar to the classical CAPM (Sharpe, 1964) computed as follows:

$$E(r)_{CAPM} = r_f + \beta\left(E(r_m) - r_f\right) \quad (1)$$

where:

r_{CAPM} = estimated discount rate using the single-factor model
r_f = the risk-free interest rate
$E(r_m)$ = yield of a market index considered a proxy for the market portfolio
β = index that measures the degree of variability of the rate estimated as a function of the market variation.

This approach assumes the possibility of identifying an index representative of the market risk for all debtors considered in the estimate of the LGD (Duellmann and Trapp, 2004). The analyses carried out with these approaches usually use a proxy for the market index indicators relative to the average behavior of the defaulted bonds negotiated in the market (Altman, Brady, Resti and Sironi, 2002).

The estimate of the parameter β is made in finance with a historical series regression of the value of the financing activity relative to the market index historical series (Saita, 2006) and premises the availability of historical series that are adequately long and continuous (Damodaran, 1996). Analysis of the data available on recovery processes suggests a problem with this approach tied to the impossibility of borrowing. The approach is also limited by the unavailability of historical series adequately long. Therefore it is commonly necessary to estimate this parameter not on individual financings granted but on aggregations of financings having common characteristics. This estimation approach limits the accuracy of the estimate. The treatment of aggregates of similar operations makes it possible to increase the time horizon of observation by taking into consideration the yields of positions gone into default or closed on different dates. However, it is strongly influenced by the arbitrary criteria defined by the evaluator in the identification of the homogenous financing categories.

A HOLISTIC MODEL

The limitations associated with the alternatives proposed in the literature suggest the possibility of a new approach to measuring the discount rate that is more reasonable than the risk-free rate approach or the contractual loan rate approach. This new approach might define a value within these two extremes. Problems with the identification of relevant parameters for estimating the discount rate and the low significance of the market indices for distressed bonds (Damodaran, 1996), can make the single-factor approach unsuited. This limitation creates the premises for the development of more complex evaluation models that are less approximate. These new methods are based on a multi-factor model. On the basis of the literature presented and excluding all the aspects regarding the debtor, the contract typology and the presence of real or personal guarantees (Araten, Jacobs and Varshney, 2004), the following can be identified as relevant recovery-risk variables (Bank of Italy, 2001):

- the risk-free rate;
- the debtor's reference industrial sector;
- the competent court for recovery processes;
- the type of recovery action launched.

The model for estimating the discount rate in its minimum formulation should, simultaneously consider variables regarding both qualitative and quantitative aspects.

Having defined the functional form most suited for the estimate, the introduction of the two qualitative variables makes necessary an *ex-ante* study of the data available to identify a criterion for the conversion of qualitative data into measurements useable in estimating the discount rate. In the conversion of the qualitative data regarding the recovery process its efficacy must be taken into account, by attributing higher values to the recovery processes that determine more modest recovery rates. The extrapolation of a qualitative variable from the data on the competent court must instead consider the characteristics of the individual courts and of the procedures started up within these contexts. This is done by attributing higher values of the variable for the locations in which the recovery rates are usually worse.

The importance of the variables examined may be verified only by identifying significant differences in the value of the LGD related to these variables. Despite all this, it appears that the results obtained could vary significantly as a function of the portfolios of the customers studied. The analysis that follows was carried out through descriptive statistics on the relationship that exists between individual variables and the behavior of LGD.

Sector Characteristics and LGD

Losses in case of customer insolvency are tied to the general trend of the economy. It has been demonstrated that during upturn (downturn) phases of the economy the recovery process is, other conditions being equal, more (less) effective (Altman, Resti and Sironi, 2004). The impact of the economic cycle is not however independent of the debtor's sector of business and, for some business sectors, structural differences in the efficacy of the recovery processes are present (Frye, 2000). The importance of the customers sector for the recovery process characteristics was investigated. We examine how the dynamics of a proxy for LGD, estimated for the country Italy, differ depending on the sector considered. We also examine whether such differences can justify a correction in the rate used to compute the current value of the recovery flows.

In order to obtain an average estimate of the relevance of the factors identified for the Italian market, a standard approach was used following Sironi and Zazzara, 2003. A proxy for LGD was constructed through the statistical return flow of the Bank of Italy Risks Department (Bank of Italy, 1991). The characteristics of the data gathered by the Bank of Italy allow computation of LGD as a ratio between the number of passages to loss of the bad and doubtful debts (the LGD given the default event) and the population of credits that dropped into bad and doubtful debts during the preceding period (Bank of Italy, 2000). This relationship can be mathematically stated as:

$$LGD_t = \frac{PP_t}{SF_{t-1}} \times 100 \qquad (2)$$

Where:

LGD_t = estimated value of the LGD;
PP_t = number of passages into loss;
SF_t = amount of bad and doubtful debts.

On the basis of data available, the variable was computed using the statistical data for the period 1999-2004 provided by the Bank of Italy and calculating some synthesizing indicators on the indicator distribution (see Table 1).

The comparison between the average estimated value for the Italy aggregate and the value for the individual sectors demonstrates significant differences in the measurement of the LGD. These differences make it possible to hypothesize a relation between the debtor sector of business and the efficacy of the recovery process (Carthy, Hamilton, Keenan, Moss, Mulvaney, Marshella and Subhas, 1998). The balance sheet assets of subjects belonging to different sectors are not similar and, therefore, the size of the recovery flows may be significantly influenced by the type of business sector (Carthy, Hamilton, Keenan, Moss, Mulvaney, Marshella and Subhas, 1998).

Table 1: Descriptive Statistics of the LGD by Sectors of Economic Activity

	LGD									
	1999	**2000**	**2001**	**2002**	**2003**	**2004**	**Mean**	**St. Dev.**	**Min**	**Max**
Agriculture	1.89%	1.58%	0.48%	0.43%	0.12%	0.32%	0.80%	0.74%	0.12%	1.89%
Energy	2.56%	3.47%	0.39%	0.32%	0.14%	0.31%	1.20%	1.44%	0.14%	3.47%
Ferrous & non-ferrous metals	3.14%	3.56%	1.37%	0.80%	0.25%	0.25%	1.56%	1.45%	0.25%	3.56%
Non-metal minerals	3.08%	5.72%	0.63%	1.01%	0.29%	0.28%	1.84%	2.17%	0.29%	5.72%
Chemicals	2.47%	5.10%	3.38%	0.56%	0.02%	0.13%	1.94%	2.06%	0.02%	5.10%
Metals	3.00%	5.09%	0.98%	0.90%	0.17%	0.28%	1.74%	1.93%	0.17%	5.09%
Farm& industrial machinery	2.76%	5.17%	1.23%	1.17%	0.17%	0.64%	1.86%	1.84%	0.17%	5.17%
Office machines	2.77%	6.19%	0.98%	0.92%	0.16%	0.23%	1.88%	2.31%	0.16%	6.19%
Electrical material	3.84%	6.38%	1.31%	0.66%	0.13%	0.70%	2.17%	2.44%	0.13%	6.38%
Transport	4.97%	3.63%	1.03%	0.95%	0.28%	0.22%	1.85%	1.98%	0.28%	4.97%
Food	4.53%	4.15%	1.05%	0.54%	0.16%	0.77%	1.87%	1.94%	0.16%	4.53%
Textiles	4.03%	4.76%	0.54%	0.45%	0.19%	0.39%	1.73%	2.08%	0.19%	4.76%
Paper	2.62%	6.10%	0.43%	0.49%	0.31%	0.27%	1.70%	2.33%	0.31%	6.10%
Rubber and plastic	3.01%	4.38%	0.56%	0.83%	0.28%	0.50%	1.59%	1.69%	0.28%	4.38%
Other industrial products	4.43%	3.91%	0.52%	0.45%	0.18%	0.49%	1.66%	1.95%	0.18%	4.43%
Building construction	3.14%	2.48%	0.63%	0.42%	0.07%	0.16%	1.15%	1.32%	0.07%	3.14%
Trade	3.94%	3.30%	0.78%	0.86%	0.21%	0.35%	1.57%	1.62%	0.21%	3.94%
Hotels and public services	3.17%	2.31%	0.66%	0.68%	0.27%	0.18%	1.21%	1.23%	0.27%	3.17%
Transport and linked services	4.54%	3.11%	0.99%	0.78%	0.13%	0.78%	1.72%	1.72%	0.13%	4.54%
Communications	3.66%	2.68%	1.01%	0.60%	0.15%	0.43%	1.42%	1.42%	0.15%	3.66%
Italy	**3.52%**	**3.05%**	**1.25%**	**0.63%**	**0.76%**	**0.76%**	**1.66%**	**1.28%**	**0.63%**	**3.52%**

This table presents estimates of LGD for different sectors in the Italian market. Data collected from Bank of Italy official database.

Analysis of the variability involved during the years considered suggests a different degree of randomness in the recovery process depending on the business sector considered. The strong variability recorded for the LGD in certain sectors brings out, the need to evaluate the companies belonging to different sectors independently. It also suggests penalizing, by using of higher discount rates, companies belonging to the sectors where the variability is more accentuated. Further analysis might consider the impact of the industry-specific stress conditions on the variability of LGD (Brady, Chang, Miu, Ozdemir and Schwartz, 2006).

The Characteristics of the Competent Court and its Impact on the LGD

The competent court can influence the estimate of the economic value of LGD because the efficacy of judicial procedures is closely tied to the length of the recovery process and to the costs that the intermediary must sustain to enforce the claims (Carey and Gordy, 2005). Empirical analyses in the literature have the presence of a relationship between the geographic location of the court and the efficacy

of the recovery process in Italy. These findings support the need to make differentiated estimates depending on geographic area in order to obtain correct evaluations of LGD (De Laurentis and Riani, 2005).

The evaluation of the impact of the competent court's characteristics on the efficacy of the recovery process can be investigated by considering the data gathered by the Italian National Institute of Statistics (henceforth ISTAT) on the costs of administrative trials held in Italy over the past years (data are available only for the period 2000-2003) (see Table 2).

Table 2: Incidence of Recovery Costs by Geographic Area

Region	Recovery costs / Initial Exposure				Mean	St. Dev.	Min	Max
	2000	2001	2002	2003				
Piemonte	24.1%	24.3%	19.4%	24.8%	23.15%	2.52%	19.40%	24.80%
Valle d'Aosta	27.4%	17.0%	18.6%	22.8%	21.45%	4.66%	17.00%	27.40%
Lombardia	23.1%	22.5%	23.9%	20.4%	22.48%	1.50%	20.40%	23.90%
Trentino-Alto Adige	38.2%	22.8%	25.7%	24.8%	27.88%	6.99%	22.80%	38.20%
Bolzano	25.9%	23.1%	26.5%	24.5%	25.00%	1.52%	23.10%	26.50%
Trento	53.0%	22.1%	25.0%	25.7%	31.45%	14.45%	22.10%	53.00%
Veneto	19.4%	20.4%	19.3%	19.5%	19.65%	0.51%	19.30%	20.40%
Friuli-Venezia Giulia	23.2%	20.9%	26.4%	23.3%	23.45%	2.26%	20.90%	26.40%
Liguria	25.2%	19.9%	20.4%	32.3%	24.45%	5.75%	19.90%	32.30%
Emilia-Romagna	16.6%	18.2%	14.2%	18.9%	16.98%	2.09%	14.20%	18.90%
Toscana	28.7%	18.1%	26.0%	20.3%	23.28%	4.92%	18.10%	28.70%
Umbria	19.0%	20.3%	16.8%	18.6%	18.68%	1.45%	16.80%	20.30%
Marche	25.9%	20.1%	21.9%	22.4%	22.58%	2.43%	20.10%	25.90%
Lazio	17.5%	14.8%	20.2%	19.9%	18.10%	2.51%	14.80%	20.20%
Abruzzo	18.5%	22.6%	20.9%	22.6%	21.15%	1.94%	18.50%	22.60%
Molise	14.2%	17.9%	20.3%	19.8%	18.05%	2.77%	14.20%	20.30%
Campania	26.3%	22.4%	15.6%	17.2%	20.38%	4.90%	15.60%	26.30%
Puglia	22.3%	19.7%	25.5%	29.0%	24.13%	4.02%	19.70%	29.00%
Basilicata	22.0%	24.4%	14.8%	12.2%	18.35%	5.78%	12.20%	24.40%
Calabria	19.0%	27.8%	24.1%	25.0%	23.98%	3.67%	19.00%	27.80%
Sicilia	21.6%	15.9%	13.9%	17.9%	17.33%	3.28%	13.90%	21.60%
Sardegna	29.7%	30.7%	25.7%	25.1%	27.80%	2.81%	25.10%	30.70%
Italy	**21.9%**	**19.8%**	**20.8%**	**20.9%**	**0.86%**	**0.86%**	**19.80%**	**21.90%**

This table presents estimates of the relevance of recovery costs for different regions in Italy. Data collected from ISTAT.

Analysis of the ratio of costs to starting exposure for the different regions indicates significant differences in the difficulty of bringing suit for recovery by competent court. The study on average costs sustained indicates, that it is on average more economical to bring suit for recovery in some regions in the north of Italy. The results hold even if rankings of the regions on the basis of the incidence of costs are time dependent.

The study of the variability of the costs/exposure ratio indicates that for some regions (Trentino Alto Adige and Toscana) and for some provinces (Bolzano and Trento) variability is significantly higher than for the rest of Italy. The strong variability in the costs tied to the recovery process identified in some geographic areas represents a further risk factor for the intermediary. This cost variability further complicates estimating the discount rate for the LGD and should explicitly be consider.

The study of the impact of the court's characteristics on the recovery process must be completed by an analysis of the average duration of the suits and of the variability of their duration. In fact, a high variability in lawsuit duration identifies the riskiest scenario, in which the estimates made can be only slightly credible. In these instances recovery uncertainty is likely to be an increasing function of the time-to-recovery due to the exposure to unknown factors till the realized ultimate recovery (Miu and Ozdemir, 2005). Analysis of the ISTAT data on administrative trials held in Italy demonstrates the presence of significant differences among the individual regions, which could influence the efficacy of the recovery process (table 3).

Table 3: Duration of Recovery by Geographic Area

Region	Duration of the Recovery Process (n° of days)				Mean	St. Dev.	Min	Max
	2000	2001	2002	2003				
Piemonte	2,331	2,381	2,495	2,695	2,476	162	2,331	2,695
Valle d'Aosta	1,744	3,995	2,234	2,310	2,571	982	1,744	3,995
Lombardia	2,237	2,277	2,423	2,568	2,376	151	2,237	2,568
Trentino-Alto Adige	1,684	2,085	2,124	2,160	2,013	222	1,684	2,160
Bolzano	1,546	2,016	2,094	2,285	1,985	314	1,546	2,285
Trento	1,891	2,164	2,160	1,890	2,026	157	1,890	2,164
Veneto	2,692	2,881	3,007	3,060	2,910	164	2,692	3,060
Friuli-Venezia Giulia	2,209	2,551	2,471	2,452	2,421	148	2,209	2,551
Liguria	2,433	2,430	2,612	2,500	2,494	85	2,430	2,612
Emilia-Romagna	2,719	2,773	2,988	3,162	2,911	204	2,719	3,162
Toscana	2,505	2,726	2,784	2,901	2,729	166	2,505	2,901
Umbria	2,660	2,449	3,164	2,918	2,798	310	2,449	3,164
Marche	3,242	3,777	3,615	3,657	3,573	231	3,242	3,777
Lazio	1,968	1,987	2,098	2,211	2,066	112	1,968	2,211
Abruzzo	2,638	2,100	2,462	2,539	2,435	235	2,100	2,638
Molise	3,211	3,518	3,703	3,304	3,434	221	3,211	3,703
Campania	2,166	2,506	2,546	2,560	2,445	187	2,166	2,560
Puglia	3,045	3,458	3,458	3,327	3,322	195	3,045	3,458
Basilicata	2,878	1,676	3,167	3,399	2,780	766	1,676	3,399
Calabria	2,872	3,324	3,564	2,986	3,187	317	2,872	3,564
Sicilia	3,377	3,731	3,791	3,386	3,571	221	3,377	3,791
Sardegna	2,270	2,346	2,835	2,657	2,527	265	2,270	2,835
Italy	**2,431**	**2,577**	**2,724**	**2,785**	**2,629**	**158**	**2,431**	**2,785**

This table presents data about the duration of recovery processes for different regions in Italy. Data collected from ISTAT.

Analysis of the costs and duration of the trials identifies areas of excellence were LGD values are significantly lower than the average calculated for Italy (Cossin, Huang, Aunon-Nerin and Gonzalez, 2003). Also identifiable are geographic areas exhibiting a greater (lesser) variability of the recovery rates relative to the national average value and, therefore, a (greater) lower risk tied to the recovery processes.

The Importance of the Type of Recovery Action

The effectiveness of the recovery process is not independent of the type of recovery action because the mean duration of recovery processes differs significantly depending on the type of recovery process and the activities engaged in by the creditor (Table 4).

The choice adopted for type of recovery shows significant differences between in-court and out-of-court operations. The out-of-court agreement represents the solution that minimize the duration of the process but exposes to uncorrected estimates of duration. The in court approach are the solutions usually having a duration close to the average estimated value. The variability of the length of the recovery process due to the type of process determines the need to penalize (reward) in terms of greater (less) discount rate the operations that potentially are the most (least) exposed to the risk that the process extend beyond expectations.

Table 4: Duration of Recovery Process (n° of days) Classified per Type of Recovery Action

	Mean Duration of Recovery Process (n° days)							
	Liquidation				**Assets Insufficiency**			
	2000	**2001**	**2002**	**2003**	**2000**	**2001**	**2002**	**2003**
Piemonte	2,597	2,675	2,915	2,999	1,708	1,720	1,684	2,099
Valle d'Aosta	2,418	5,851	2,540	3,409	578	2,510	1,621	654
Lombardia	2,675	2,748	2,924	3,058	1,751	1,601	1,746	1,876
Trentino-Alto Adige	2,232	2,565	2,567	2,581	1,220	1,396	1,133	1,417
Bolzano	2,086	2,727	2,785	2,706	1,185	1,151	894	1,569
Trento	2,391	2,407	2,357	2,343	1,283	1,745	1,551	897
Veneto	3,021	3,249	3,370	3,375	2,153	2,223	2,325	2,509
Friuli-Venezia Giulia	2,635	2,841	2,785	2,978	1,327	1,500	1,954	1,323
Liguria	3,004	2,680	3,119	2,856	1,863	2,047	1,942	1,978
Emilia-Romagna	3,054	3,269	3,402	3,618	2,063	1,701	2,001	2,062
Toscana	2,978	3,141	3,274	3,286	1,710	2,007	1,922	2,138
Umbria	3,338	3,027	3,927	3,428	2,040	1,737	2,149	2,378
Marche	3,655	4,142	3,993	4,067	2,642	3,178	3,021	2,993
Lazio	3,107	2,952	3,162	3,157	1,566	1,622	1,675	1,761
Abruzzo	3,679	2,831	3,274	3,692	2,085	1,800	2,084	2,079
Molise	4,453	3,990	4,863	4,093	758	2,510	2,286	3,216
Campania	3,249	3,625	3,659	3,465	1,967	2,248	2,227	2,204
Puglia	3,862	4,258	4,111	3,974	2,617	2,888	2,991	2,961
Basilicata	4,108	3,070	4,206	4,052	3,051	1,335	2,285	2,926
Calabria	4,066	4,105	4,069	3,662	2,615	3,153	3,262	2,847
Sicilia	4,329	4,778	4,882	4,103	3,107	3,221	3,339	3,009
Sardegna	2,982	2,941	3,307	3,251	1,792	2,083	2,275	2,065
Italy	**3,025**	**3,146**	**3,336**	**3,347**	**1,954**	**2,035**	**2,166**	**2,240**
	Fully Refunding				**Agreement**			
	2000	**2001**	**2002**	**2003**	**2000**	**2001**	**2002**	**2003**
Piemonte	461	1,964	1,713	672	2,481	2,278	2,175	3,305
Valle d'Aosta	-	-	1,546	3,122	1,204	-	1,051	1,561
Lombardia	2,119	2,346	2,564	2,066	2,746	2,281	2,280	2,914
Trentino-Alto Adige	1,010	3,209	2,215	798	2,436	1,758	-	2,903
Bolzano	1,285	2,945	-	798	4,458	-	-	3,416
Trento	461	4,266	2,215	-	414	1,758	-	1,878
Veneto	1,732	2,565	2,945	2,788	2,885	2,972	3,152	3,225
Friuli-Venezia Giulia	574	1,188	1,434	1,647	2,455	3,230	675	1,455
Liguria	2,268	2,321	1,682	2,506	1,852	1,782	5,263	1,228
Emilia-Romagna	2,522	3,055	3,808	2,084	2,988	3,538	2,668	4,034
Toscana	2,520	2,235	2,513	2,092	1,979	2,601	2,639	3,466
Umbria	1,650	5,390	-	1,346	1,905	-	2,293	2,249
Marche	-	3,713	3,043	3,784	4,005	3,836	3,011	4,080
Lazio	2,117	2,904	2,901	2,394	2,355	2,527	1,861	2,189
Abruzzo	-	4,103	2,973	2,458	3,815	572	5,756	3,059
Molise	5,800	-	2,202	-	-	-	3,248	2,993
Campania	2,241	3,382	2,709	3,499	1,771	2,390	2,894	2,891
Puglia	3,893	3,574	4,501	3,351	2,861	3,704	3,216	4,438
Basilicata	-	1,915	-	1,440	885	1,554	2,832	4,528
Calabria	3,269	4,687	4,164	3,772	3,543	2,839	3,775	1,858
Sicilia	3,466	2,816	3,223	3,781	3,463	5,351	5,318	4,356
Sardegna	1,649	1,460	2,979	2,057	3,209	1,234	4,804	5,804
Italy	**2,299**	**2,881**	**2,899**	**2,670**	**2,576**	**2,865**	**2,875**	**3,016**

This table presents data about the duration of recovery processes for different regions in Italy. Data collected from ISTAT.

CONCLUSIONS

In this paper, we examine methods to select the proper discount rate to estimate LGD using a workout approach. The types of discount rate selected in the literature can be grouped into the following approaches: the contractual or original loan rate; the risk free rate; the single index model based rate. We contrast and compare the different methodologies.

We point out that the risk free rate understates the underlining recovery process risk, while the contractual loan rate, like the one proposed by the IAS/IFRS, is inadequate for long lasting recovery process or when the starting moment of the recovery process dates back in the past. We illustrate that the properties of the contractual loan rate are not coherent with the LGD measurement reflecting the volatility of the cash flows and the financial intermediary's efficiency during the recovery period. When the default occurs, the credit risk for the financial intermediary changes drastically as the payment source changes. That is when the focus of the debtor changes from servicing the debt to recovery. Among the risk adjusted approaches potentially coherent with the requirements under the New Basel Accord, we show that the mono-factorial approach is not adequate when other risks besides the economic cycle are present. We propose a multi-factorial approach as a more effective measure to explain LGD volatility and we show empirically the relevance of factors affecting the recovery action, like the debtor's economic sector, the competent court and the type of the recovery action.

NOTES

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AN INVESTIGATION OF THE VALUE RELEVANCE OF THE CORPORATE TAX REDUCTIONS FROM 1987 CANADIAN TAX REFORM

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ABSTRACT

This paper examines the impact of tax savings from the 1987 Canadian Tax Reform on firm equity value in the context of a tax-based market valuation model. The 1987 Canadian Tax Reform, which dramatically changes the tax regime in Canada, provides a unique opportunity to test the effects of the changes in corporate taxes on the implementation of the market valuation model. This study assesses the incidence of the Canadian Tax Reform and the firms' potential tax savings under the reform, and links this to market value. The empirical results document a significant and positive association between levels of tax savings from the tax reform and levels/changes of stock prices. This paper provides evidence consistent with the perceived importance of corporate tax payment in the marketplace.

INTRODUCTION

It is important to understand the effect of corporate taxes on equity valuation (Dempsey, 1996, 1998a, 1998b, Pincus, 1997) and the firm's responses to anticipated tax changes (Givoly et al, 1992, Scholes et al, 1992, etc.). In this paper, I examine the impact of tax savings from the 1987 Canadian Tax Reform on firm equity value in the context of a tax-based market valuation model.

The 1987 Canadian Tax Reform, which dramatically changes the tax regime in Canada, provides a unique opportunity to test the effects of the changes in corporate taxes on the implementation of the market valuation model. A complete assessment of these effects may require the evaluation of hundreds of changes that are contained in the reform, which is an impractical work. Hence, I concentrate on those changes that are more likely to influence the corporate tax payment.

The most significant changes are the reduction on federal statutory tax rates and the tax base broadening. Several other changes directly or indirectly affect corporate taxes. For example, capital gains inclusion rate increases from 1/2 to 2/3; general investment tax credits are eliminated except in the area of Gaspe and Atlantic. However, this study does not examine those changes because the data is not available. Two major changes relevant to corporate taxation are examined by this study. They are tax rate reduction and capital cost allowance restriction.

Tax rate reduction. Federal statutory corporate tax rates are lower starting July 1, 1988. The general federal rate falls from 36% to 28%. The tax rate for manufacturing income is reduced from 30% to 26% in 1988, and thereafter is reduced by 1% per year to reach 23% on July 1, 1991 (see Table 1 for the details). Reducing the statutory tax rate has confounding effects on the market valuation question. Lower corporate tax reduces a firm's tax payment (current tax and deferred tax).

The tax base is broadened by the restriction on the capital cost allowance of manufacturing machinery and

equipment. The 3-year straight-line write-off for machinery and equipment acquired after 1987 is reduced to a 25% declining balance rate (the half-year rule remains). The restriction on capital cost allowance reduces tax deductions, i.e., increases a firm's taxable income.

Table 1: Federal Corporate Statutory Tax Rates

	Before 1988	**1988**	**1989**	**1990**	**1991- 2001**	**2002**	**2003**	**2004**	**After 2004**
General Business	36	28	28	28	28	27	25	23	21
Manufacturing Business	30	26	24	23	21	21	21	21	21

Source: The White Paper Tax Reform 1987, p. 44

In summary, compared with the year 1987, in 1988, firms have lower federal statutory tax rates; the taxable income might be increased because the capital cost allowance on machinery and equipment acquired in 1988 are reduced.

This study assesses the incidence of the tax reform and the firms' potential tax savings under the reform, and links this to market value. The empirical results document a significant and positive association between levels of tax savings from the tax reform and levels/changes of stock prices. This paper provides evidence consistent with the perceived importance of corporate tax payment in the marketplace.

LITERATURE

It is generally argued that corporate taxes reduce firm value and thus a reduction on corporate tax payments will increase share prices, the empirical evidence is mixed. For example, Biddle and Lindahl (1982) examine the market reaction to the firms that adopted LIFO in the period of 1973-1980. Excess returns are regressed on the unexpected earnings and a measure of the tax savings from LIFO adoption. The coefficient on the tax saving variable is positive and significant, which leads to the conclusion that the market reacts positively to the tax savings.

Pincus (1997) analyses the legislative event of LIFO's incorporation into the US tax code around the year 1938. He finds a positive net market reaction to the legislative event for the firms having the largest estimated LIFO tax benefits. He argues that this is because LIFO provides the opportunity for these firms to defer taxes on inventory profits.

On the other hand, Lev and Nissim (2002) and Hanlon (2003) find that large book-tax gaps are associated with a subsequent negative abnormal return, which indicates that tax-motivated activities do not correspond into higher share value. However, the book-tax gap need not represent increasing of tax sheltering to save taxes. Especially, earning management, i.e., the smoothing/increasing of reported financial income over time to reach bonus targets, to avoid reporting losses, and to achieve other aims, might have contributed to this large gap.

Weisbach (2002) asks why firms do not use the tax shelters to reduce tax liabilities more extensively, given the ease and low expected costs of such shelters. He calls it "undersheltering puzzle". Desai and Dharmapala (2004) explain that shareholders do not want managers to engage in tax sheltering to save taxes, despite the obvious gains in after-tax firm value, because doing so may create opportunities for managers to divert firms' earnings.

The 1987 Canadian Tax Reform, which dramatically changes the tax regime in Canada, provides a unique

opportunity to examine the impact of corporate taxes on firm value. This study seeks to test the effects of the changes in corporate tax payment on the implementation of the market valuation model. In this study, I develop a tax-based valuation model based on Ohlson (1995) residual model. Ohlson (1995) examines the relation between firm market value and accounting data such as book value, earnings, and dividends under clean surplus accounting. He combines the dividend-discounted model and clean surplus accounting, and indicates that firm market value is a function of the firm's current book value plus the present value of the expected future abnormal earnings. The tax-based valuation model incorporates taxes into the model and indicates that a firm's market value is a function of the firm's current book value and the present value of the expected future abnormal earnings, net of the present value of the expected future tax payment.
The purposes of this paper are two-fold. First, it assesses the impacts that the tax reform has on corporate taxes. Second, this paper links the impact of the tax reform to market value using a tax-based valuation model. The empirical tests using Canadian public firms' financial data show a positive association between the level/change in market value and the tax savings.

METHODOLOGY AND DATA

Tax-Based Market Valuation Model

Consistent with the terminology in Ohlson's (1995) model, I let
bv_t = firm book value, date t.
x_t = earnings (before tax) for period (t-1, t).
d_t = dividends (and share repurchases), net of capital contributions, date t.
P_t = firm market value, date t.
R_F = one plus the risk-free interest rate r.

In addition, I define the following variables.
T_t = the difference between accounting deductible accruals and tax-deductible accruals (for example, capital cost allowance or depreciation allowed for tax purposes); $x_t - T_t$ = taxable income.
τ_t = corporate tax rate, date t.

The firm's market value P_t is equal to the present value of the expected dividends discounted at the risk-free interest rate:

$$P_t = \sum_{j=1}^{\infty} R_F^{-j} E_t[d_{t+j}] \qquad (1)$$

The accounting variables satisfy the clean surplus relation, that is, all changes in book value are reported as either income (net of tax and deferred tax) or dividends:

$$bv_t = bv_{t-1} + [x_t - \tau_t(x_t - T_t) - \tau_t T_t] - d_t = bv_{t-1} + (1-\tau_t)x_t - d_t \qquad (2)$$

Where the tax payment is $\tau_t(x_t - T_t)$; the deferred tax is $\tau_t T_t$.

Notice that I distinguish before-tax earnings x_t and earnings net of the tax payment and deferred tax, i.e., $x_t - \tau_t(x_t - T_t) - \tau_t T_t$.

From equation (2), dividends are equal to

$$d_t = bv_{t-1} - bv_t + (1-\tau_t)x_t \tag{3}$$

Similarly, I define the after-tax abnormal earnings as

$$x_t^a = (1-\tau_t)x_t - (1-\tau_t)(R_F - 1)bv_{t-1} \tag{4}$$

That is, the after-tax abnormal earnings are the difference between the actual after-tax earnings and the estimate of after-tax earnings.

The definition of the after-tax abnormal earnings shows that the estimate of after-tax earnings is $(1-\tau_t)(R_F - 1)bv_{t-1}$, and thus the estimate of total taxes (current taxes and deferred taxes) is $\tau_t(R_F - 1)bv_{t-1}$. The present value of the estimate of the future total taxes will be $\tau_t(R_F - 1)\sum_{j=1}^{\infty} R_F^{-j} E_t[bv_{t-1+j}]$.

Combining equation (1), (3), and (4) arrives at the tax-based market valuation model.

$$P_t = bv_t + \sum_{j=1}^{\infty} R_F^{-j} E_t[x_{t+j}^a] - \tau_t(R_F - 1)\sum_{j=1}^{\infty} R_F^{-j} E_t[bv_{t-1+j}] \tag{5}$$

Provided $R_F^{-j} E_t[bv_{t+j}] \to 0$, as $j \to 0$.

Under the tax-based model, firm stock price is a function of the current book value and the present value of the expected future after-tax abnormal earnings, net of the present value of the expected estimate of the future taxes. It shows that any tax change, which influences the firm's expected future tax payment (e.g., the change in corporate tax rates), may affect its market value. Hence, the model provides a theoretical framework for analysis of the tax effects on firm market value.

Empirical Regression Models

The tax-based framework shows that firm market value is a function of current book value and the present value of the expected future abnormal earnings, net of the present value of the expected future tax payment. It is a price-level regression model:

$$P_{it} = \beta_0 + \beta_1 bv_{it} + \beta_2 x_{it}^a + \beta_3 \Delta tax_{it} + v_{it} \tag{6}$$

In addition, I test the first difference of the model, i.e., the change in share price is regressed on the change in book value, the change in the expected future abnormal earnings, and the change in the expected future tax payment:

$$P_{it} = \alpha_0 + \alpha_1 \Delta bv_{it} + \alpha_2 \Delta x^a_{it} + \alpha_3 \Delta tax_{it} + \varepsilon_{it} \quad (7)$$

Data Collection and Variable Definition

The data is obtained from the "Canadian Financial Post Card" database. The database provides detailed information about Canadian public and private companies, company directors, archival financial information, etc. The firms used in the tests should satisfy the following conditions: (1). public companies with share prices listed on the Toronto Security Exchange market (TSX). (2). available accounting data for the years 1983 to 1988. (3). fiscal year ended on December 31 in 1988. (4). not in the banking, real estate, insurance, and financial institutions. There are 206 firms.

The first condition is necessary to compute the firm market value. The second condition is necessary to compute variables whose computation requires 6 years. The third condition is required to maintain a uniform period when analysing the tax savings from the 1987 Tax Reform. The fourth condition eliminates firms in certain industries since they are affected by the 1987 Tax Reform differently.

The variables for the tests are measured as follows: the market value is measured as the shares outstanding at the end of the year, multiplied by the year-end share price listed on the TSX. The dependent variable is the first difference between the 1988 market value and the 1987 market value.

The book value is measured as the shareholders' equity at the end of the year from the balance sheet. The change in book value is the first difference between the 1988 book value and the 1987 book value. The abnormal earnings are calculated as the 1988 after-tax earnings, minus the averaged after-tax earnings. The averaged after-tax earnings are the averaged after-tax earnings for the previous five years, from 1983 to 1987. I assume that the difference between the 1988 earnings and the averaged previous 5 years' earnings relates to the change in the expected future abnormal earnings. Hence, the 1988 abnormal earnings are used as a proxy for the variable of the change in the expected future abnormal earnings.

The changes in the tax payment in 1988 due to the tax reform are calculated as follows: for non-manufacturers, the statutory tax rate is reduced from 36% to 28% starting from July 1, 1988. That is an 8% reduction on the tax rate for a whole year, and a 4% reduction for half a year. For manufacturers, the statutory tax rate is reduced from 30% to 26% starting from July 1st, 1988. That is a 4% reduction on the tax rate for a whole year, and a 2% reduction for half a year. Hence, the tax savings due to the reduction in statutory tax rates is, $(R_F - 1)bv_{t-1} \times 4\%$ for a non-manufacturing business, and $(R_F - 1)bv_{t-1} \times 2\%$ for a manufacturing business. The previous book value, multiplied by the risk-free interest rate, is the estimate of current earnings before tax. Risk-free interest rate is measured as the one-year yield at the end of 1988 on the Treasury bill (Bank of Canada Review, 1988).

The increase in the tax payment due to the change in capital cost allowance on machinery and equipment is calculated as follows: before the tax reform, the write-offs on machinery and equipment involved a

three-year straight-line deduction (i.e., a 33.33% deduction each year). In 1988, the machinery and equipment were written-off by 25%. That is, the write-offs on the machinery and equipment that were newly acquired in 1988 decreased from 33.33% to 25%. The reduction on capital cost allowance for machinery and equipment in 1998 (compared that in 1987) is:

$$1/2 \times (33.33\% - 25\%) \times M \ \& \ E = 1/24 \times M \ \& \ E .$$

M&E are the machinery and equipment that were newly acquired in 1988. M&E can be obtained either from the balance sheet under the fixed assets of plant, property and equipment, or from the footnotes to the fixed assets. A firm's taxable income would be increased due to the deduction on capital cost allowance. Thus, the tax payment would be increased, which is equal to $\tau_e \times 1/24 \times M \ \& \ E$. Where τ_e represents the effective tax rate in the year 1988. It can be collected from the tax footnotes in the financial reports. In summary, the tax savings from the 1987 Canadian Tax Reform are calculated as follows:

$$(R_F - 1) bv_{t-1} \times \Delta\tau - \tau_e \times 1/24 \times M \ \& \ E$$

$\Delta\tau$ is the percentage of statutory corporate tax rate that was reduced in 1988, equal to 2% for manufacturers, and 4% for other general business.

RESULTS

Table 2 presents the descriptive statistics of the four independent variables: the change in book value, after-tax abnormal earnings, and the tax savings due to the 1987 Tax Reform. The mean and median of the tax savings are 1.2137 and 0.2280, which implies that corporate taxes are generally reduced after the tax reform. That is, the impact of tax rate reduction dominates the impact of capital cost allowance restriction.

Table 2: Descriptive Statistics of Independent Variables

Variables	**Mean**	**Median**	**Std. Dev.**	**Max.**	**Min.**
Change in Book Value	34.6168	5.800	110.88	841.1	-427.7
Abnormal Earnings	21.7830	1.4200	99.681	768.25	-194.8
Tax Saving	1.2137	0.2280	4.0620	36.258	-18.292

This table shows the mean, median, standard deviation, maximum, and minimum values of the independent variables.

Table 3 presents the results similar to the work of Biddle and Lindahl (1982) where two explanatory variables are used in the regression model. The independent variables are abnormal earnings and tax savings. It is shown that the coefficients have the signs as predicted and statistically significant at 0.01 levels. Abnormal earnings are positively associated with the change in market value and significant at 0.01 levels. The changes in tax payment, i.e., tax savings, are also positively associated the change in market value and significant at 0.01 level. The results are consistent with Biddle and Lindahl (1982) and support the argument that tax payments/savings decrease/increase firm market value.

Table 3: Regression Results

Variables	**Predicted Sign**	**Co. Eff.**	**Std. Err.**	**t-Test**
Intercept		17.317	16.258	1.0651
Abnormal Earnings	+	0.3992	0.1565	2.5509*
Tax Saving	+	8.5269	3.8398	2.2206*

*This table shows the predicted sign, co- efficient, standard error and t-statistics. * significant at 0.01 level* R^2 *= 0.0591*

Table 4 presents the results when the change in market value is regressed on the change in book value, abnormal earnings, and tax savings. It is shown that the coefficients of all the three variables have the signs as predicted and statistically significant, which supports the tax-adjusted market valuation model. The tax savings and abnormal earnings are positively and significantly (at 0.05 levels) associated to the change in firm market value. Change in book value is positive and significant at 0.1 levels.

Table 4: Regression Results from the Change Model (7)

Variables	Predicted Sign	Co.Eff.	Std. Err.	t-Test
Intercept		12.703	16.473	0.7712
Change in Book Value	+	0.2351	0.1515	1.5518*
Abnormal Earnings	+	0.3223	0.1637	1.9694**
Tax Saving	+	7.0030	3.9506	1.7727**

This table shows the predicted sign, co-efficient, standard error and t-statistics on regressing model (7).
*** significant at 0.05 level*
** significant at 0.1 level*
$R^2 = 0.5484$

Table 5 presents the results from the regression of the price-level market valuation model, i.e., regressing stock prices on book value, abnormal earnings, and the tax savings. It is shown that the coefficients of all the three independent variables are positive and significant. The tax savings are positively and significantly (at 0.05 levels) associated with stock prices. Book value and Abnormal earnings are positively and significantly (at 0.01 levels) associated with stock prices. The results support Ohlson (1995) model and the tax-adjusted model.

Table 5: Regression results from the Price-level Model (6)

Variables	Predicted Sign	Co. Eff.	Std. Err.	t-Test
Intercept		6.2257	0.6018	10.345**
Book Value	+	1.1847	0.1932	6.132**
Abnormal Earnings	+	0.3710	0.1408	2.2643**
Tax Saving	+	65.367	37.24	1.7553*

This table shows the predicted sign, co-efficient, standard error and t-statistics on regressing model (6).
*** significant at 0.01 level*
** significant at 0.05 level*
R^2 *is 0.5583*

Table 6 presents the correlation of the independent variables. The change in book value and the change in abnormal earnings have the highest correlation (.332). The correlation of the independent variables is generally low, which indicates that multicollinearity is not a severe problem in the analysis.

Table 6: Correlation Matrix of Independent Variables

Variables	Change in Book Value	Abnormal Earnings	Tax Saving
Change in Book Value	1		
Abnormal Earnings	0.3320	1	
Tax saving	0.2843	0.1592	1

I further use White's test to test for heteroskedasticity (White, 1980). That is, I regress the squared residuals on all the squared independent variables and their cross products. The resulting R^2 is very low (0.0199),

which suggests that a constant variance cannot be rejected.

CONCLUSIONS AND LIMITATIONS

This paper examines the impact of tax savings from the 1987 Canadian Tax Reform on equity valuation in the context of a tax-based market valuation model. The 1987 Canadian Tax Reform, which dramatically changes the tax regime in Canada, provides a unique opportunity to test the effects of the changes in corporate tax payment on the implementation of the market valuation model. This study assesses the incidence of the Canadian Tax Reform and the firms' potential tax savings under the reform, and links this potential tax savings to market value.

Using Canadian public firms' financial data, I document a significant and positive association between tax savings from the tax reform and levels/changes of stock prices. This paper provides evidence consistent with the perceived importance of corporate tax payment in the marketplace.

This study is interesting to both the corporations and the policy makers, to the extent that it assists them in understanding the share price changes and market reactions to the tax reform.

This paper, however, ignores individual taxes. Quite a few recent literatures (for example, Dempsey, 1996, 1998a, 1998b, Harris and Kemsley, 1999) incorporate individual taxes into the market valuation model. Future research may seek to incorporate both corporate and individual taxes and analyse their effects on marketplace. In addition, future researches are encouraged to examine data in recent years.

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INTERNET FINANCIAL REPORTING IN OMAN

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ABSTRACT

This paper investigates the extent and variety of practices of internet financial reporting (IFR) by companies listed on the Muscat Securities Market (MSM) in Oman. While IFR is fast becoming the norm in most western countries, there is little empirical evidence of the phenomenon in the Middle East region. This paper attempts to fill some of the gap in the literature by providing evidence of IFR practices in Oman. The 142 companies listed on the MSM were investigated to ascertain whether they maintain websites and/or if these sites are being used for communicating financial information. Only 84 of the listed companies were found to operate websites, with even less (only thirty-one) engaging in IFR. However, IFR is not restricted to the publication of annual financial statements only as the companies also disclose financial highlights through their websites. The results of this study indicate that IFR is still at an embryonic stage in Oman and there are lots of opportunities and challenges for all stakeholder parties in corporate reporting. The study highlights the challenges and opportunities for IFR in the Middle East Region, as well as a number of areas for further study.

INTRODUCTION

This paper investigates and reports on the extent and nature of internet financial reporting (IFR) among companies listed on the Muscat Securities Market (MSM) in Oman. While IFR is fast becoming the norm in most western countries, there is little empirical evidence of the phenomenon in the Middle East region. Until recently, hard copies (paper) have been the primary means for communicating financial information to shareholders and other interested corporate stakeholders. Technological advancement has made the internet a useful, timely and cost-effective tool for the communication of this information to stakeholders. The internet has the potential power to revolutionize financial reporting. Companies can include the traditional annual reports together with additional financial and non-financial information in multiple formats (Jones and Xiao, 2004).

Questions persist as to whether corporate organizations in the Middle East are availing themselves of the opportunity provided by the internet to communicate financial information to their stakeholders. While the use of the Internet for the communication of financial information raises a variety of challenging issues, there is little doubt about its benefits. This paper is an important first step in gauging the extent to which such benefits are being captured in the Middle East region. Given the increasing importance of IFR and the lack of empirical study on IFR practices in the Middle East region, this paper provides an important contribution to filling the gap in our knowledge of this subject. This is of particular importance in a time when there is so much interest in investment opportunities in the region, particularly in the Arabian Gulf region that is witnessing economics growth in the light of booming oil revenues.

Evidence of IFR practices in various countries have been presented by a number of academic and professional studies – see, for example, Craven and Marston (1999); Deller *et al.* (1999); Gowthorpe and Amat (1999); Hedlin (1999); Lymer *et al.* (1999); Pirchegger and Wagenhofer (1999); Trites (1999); Marston (2003); Oyelere *et al.* (2003); Gowthrope (2004); Fisher *et al.* (2004); Laswad *et al.* (2005); and Chan and Wickramasinghe (2006). They indicate the growing use of the Internet for corporate dissemination including providing annual reports on the Internet and that the extent and sophistication of IFR practices varies across countries. The current paper provides evidence of IFR in the Sultanate of Oman.

The 142 companies listed on MSM were identified on the Omani Capital Market Authority (CMA) and MSM websites. The companies' website links, where available were, in the first instance, accessed through these websites. Otherwise, a search was made for the company site using search engines. Finally, the companies were contacted by telephone and requested to provide their website address, if any. Eighty-four MSM-listed companies were found to maintain websites; of these, only thirty-one engage in IFR, in a variety of formats, types and volume. From the results of this study, it is possible to preliminarily conclude that IFR is still at an embryonic stage in Oman, providing lots of opportunities and challenges for all stakeholder parties in corporate reporting. The study highlights some of these, as well as a number of areas for further study.

The rest of this paper is structured as follows. A review of relevant literature is provided in the next section. This is followed by a discussion of the institutional framework of the proposed research. The proposed research methodology is discussed in Section 4. Section five provides analyses and discussions on the extent and nature of IFR by companies listed in Oman. Summary and conclusions are presented in the final section.

LITERATURE REVIEW

A number of academic and professional studies have examined and presented evidence of IFR practices in various countries. These include Craven and Marston (1999) and Gowthrope (2004) - UK, Deller *et al.* (1999) - US, UK and Germany, Gowthorpe and Amat (1999) - Spain, Hedlin (1999) – Sweden, Lymer *et al.* (1999) - International Comparison, Pirchegger and Wagenhofer (1999) - Austria and Germany, Marston and Polei (2004) – Germany, Trites (1999) - US and Canada, Oyelere *et al.* (2003), Fisher *et al.* (2004) and Laswad *et al.* (2005) - New Zealand, Marston (2004) - Japan, Xiao *et al.* (2004) - China, Smith and Peppard (2005) – Ireland, Khadaroo (2005) – Malaysia, and Chan and Wickramasinghe (2006) - Australia. They indicate the growing use of the Internet for corporate dissemination, including providing annual reports on the Internet, and that the extent and sophistication of IFR practices vary across countries.

The Internet provides a useful communication tool for corporate organizations. One of the main benefits of IFR is the potential large savings in the cost of production and distribution of financial information. The Internet allows companies to reach a much wider category and variety of stakeholders at relatively lower costs, with reduction in incidental requests from non-shareholder financial statement users (Allam and Lymer, 2002; SEC,2002, 2003a,b; Khadaroo, 2005) . The literature also documents a number of other benefits that may accrue from IFR (Baker and Wallage, 2000; Ettredge *et al.*, 2001; Debreceny, *et al.*, 2002; Wagenhofer, 2003; Jones and Xiao, 2004; Boritz and No, 2005). These include more equitable information dissemination among stakeholders as a result of improved accessibility to information. With IFR, users can choose to access information that meets their specific needs as the Internet allows non-sequential access to information through the use of hyperlinks, interactive and search facilities. IFR also presents companies with the opportunity to provide more information than those available in annual reports. Potentially, the internet provides an opportunity for going beyond what is available in hard copy corporate financial statements to communicate additional financial information to users, possibly on real-time and interactive bases (McCafferty, 1995; Louwers *et al.*, 1996; Green and Spaul, 1997; Trites and Sheehy, 1997; Trites, 1999; FASB, 2000; Ettredge *et al.*, 2002; Wickramasinghe, 2006). IFR provides corporate organizations with a real opportunity to extend financial disclosure beyond the reproduction of a hard copy annual report and improve on the timeliness, scope, and interactivity of financial reporting, with multimedia, such as sound, animation and video, being used to potentially increase the understanding of information (Louwers *et al.*, 1996; Ravlic, 2000; Wickramasinghe and Lichenstein, 2006). These developments have a great potential impact on users (Wallman, 1997; Green and Spaul, 1997; Gowthrope and Flynn, 2001).

A number of IFR-related issues and challenges have, however, been noted in the literature. There is a potential that the dividing line between current financial information used by management and historical audited financial information made available to public users of financial information could be erased by online, real-time reporting (Green, 1997; Hodge, 2001; Oyelere, 2003), with auditors being possibly required to provide opinion on such hitherto internal financial information (Trites and Sheehy, 1997; Lymer and Debreceny, 2003; Khadaroo, 2005). Also, if IFR is installed as the only mode for communicating financial information, there is the likelihood that access to such information will be restricted to only those who possess costly computer equipment and skills. Hence, to ensure equity in financial information dissemination, it will be necessary to ensure that the information being reported through corporate websites are already provided previously or simultaneously through other media of financial information disclosure (McCafferty, 1995). This could however be viewed as unnecessary duplication and may result in even greater costs in Oman and other countries in the Middle East region, where financial information are commonly disseminated in both English and Arabic languages.

Additional issues and challenges for IFR include possible errors in the extraction or re-keying process, which may affect the reliability and integrity of the financial information; Generally Accepted Accounting Practice (GAAP) implications of IFR; the use of the corporate websites for many diverse purposes, which may make the location of financial information difficult; and the acceptability of Internet financial reports as alternatives to hard copy annual reports among users of corporate financial information (Laswad *et al.*, 2000).

Perhaps the greatest challenge faced in the IFR environment is that of ensuring the security and integrity of the financial information published on corporate websites. Apart from possible errors in the publishing process, materials published on the web are susceptible to all manners of security risks. Financial information could, post-publication, be knowingly or unknowingly altered by parties both external and internal to the organization. There is a real risk that critical decisions could be made by users of financial information based on inaccurate financial information gleaned from corporate websites. The extent to which these issues are dealt with is likely to determine the long-term usefulness of the Internet as a medium of corporate financial information dissemination.

More recently, some studies have provided evidence on the factors motivating the IFR behavior of companies around the world. Given the voluntary nature of IFR, these studies sought to establish the reason why companies engage in IFR and the extent of such engagement. The majority of these studies have found corporate size to be a major factor, with IFR likely to provide greater economies of scale cost savings for larger firms (Ashbaugh *et al.*, 1999; Craven and Marston, 1999; Pirchegger and Wagenhofer, 1999; Debreceny *et al.*, 2002; Ettredge *et al.*, 2002; Oyelere *et al.*, 2003). Evidence on other variables examined is largely inconclusive.

Very little, if any, evidence however exists on the extent and nature of this important practice in the Middle East region. It is predicted that IFR is likely to overtake hard-copy print form of financial information disclosure in the near future. It is therefore surprising that evidence on the variety of issues associated with this form of financial disclosure is currently not being deposited in the public domain. Such evidence will depend on the outcome of in-depth and thorough investigation and analysis, such as is being preliminarily undertaken in the current study.

Institutional Framework

This paper presents a proposed methodology for the investigation of the extent to which companies in the Middle East use the Internet to communicate financial information to their stakeholders. The study will examine the extent of financial reporting on the websites of companies listed on the Muscat Securities

Market in Oman. The environment and institutional framework of the location of the proposed study are discussed in this section.

The government of Oman realized sometime ago that in order to keep pace with international developments and enable the vision of a solid economy that will be recognized internationally, it was necessary to have a strong financial sector based on well-established financial companies. This will also facilitate a suitable environment for successful companies and projects that will add value to the economic cycle. To realize these objectives, it was decided to set up a Stock Exchange. The Exchange, called Muscat Securities Market (MSM), was set up by Royal Decree 53/88, issued on 21 June 1988. The decree set the legal framework for the establishment of the Market as an independent organization to regulate and control the Omani securities market and to participate with other organizations in setting up the infrastructure of the Sultanate's financial sector. After ten years of continuous growth of the national economy in general and the Market in particular, and to cope with new developments in the local and international financial sector, particularly in the securities industry, it was decided that there was a need for better control and regulation of market activities, to provide better protection to investors. To achieve this, it was decided to split the functions of regulation and market activities, both of which were until then functions of the MSM. Existing laws and regulations were amended to bring the market closer to international standards of practice, where the norm is to have an independent regulator, with regulatory authority over the Exchange and market participants.

The MSM was restructured by the issue of two Royal Decrees 80/98 and 82/98. Royal Decree 80/98 of 9 November 1998 provided for the establishment of two separate entities:

- a regulator, to be named the *Capital Market Authority (CMA)*, which will be a governmental authority responsible for organizing and overseeing the issue and trading of securities in the Sultanate; and
- an exchange, to be named the *Muscat Securities Market (MSM)*, where all listed securities shall be traded. The exchange shall also be a governmental entity, financially and administratively independent from the authority but subject to its supervision. The board of directors shall be elected from among members of public (governmental commercially oriented) corporations, listed companies, intermediaries, and the Central Bank of Oman.

Royal Decree 82/98 of 25 November 1998 established the Muscat Depository and Securities Registration Company, a closed joint stock company, as the sole provider, of the services of registration and transfer of ownership of securities and safe keeping of ownership documents (depository) in the Sultanate. This company is linked through an electronic system to the MSM for easy data transfer.

The government of Oman aimed to institute a well-established securities industry in the country, to help develop and sustain investors' confidence in the stock market. As a continuing process in the development of the securities market, the CMA has developed its website to make information and financial data related to the performance of the Muscat Securities Market and all listed companies available to and directly accessible by investors. This is aimed not only at ensuring transparency of activities, which is considered one of the main principles of a well organized market, but also at supporting the market by encouraging investors to make the right investment decisions. The MSM currently lists 142 companies.

METHODOLOGY

The aim of this study is to investigate and document the extent and nature of IFR practices among companies listed on MSM in Oman. The research methodology employed to accomplish this aim is presented in this section. The list of 142 companies listed on MSM was obtained from the CMA, MSM

websites. Data regarding whether these companies have a website or not were obtained via links at the CMA, MSM websites. Where these do not exist, a search was made for the company website using google.com and yahoo.com search engines. Finally, the companies were contacted by telephone and requested to provide their website address, if any.

Where corporate sites are available, we moved to the next stage of the data collection process by investigating the type of information provided at these sites. Four categories of information – company history/background, products/services, financial and other information – were of interest to us at this stage. The next stage of the data collection process involved querying the extent and nature of financial information provided on the corporate websites. Of interest are the type of financial information - that is, whether full financial statements and/or financial highlights; the format of presentation, that is whether PDF, HTML, other formats or a combination of these; and the volume of financial information presented. The data collected are then analyzed and summarized. The results of the analysis are presented and discussed in the next section.

RESULTS AND DISCUSSION

There are 142 companies listed on the MSM as at the end of June 2006. These companies are from three main industrial sectors as shown in table 1. Eighty-four of these companies were found to have corporate websites. A classification of "websiters" and "non-websiters" by industry is provided in Table 2.

Table 1: MSM Distribution by Industrial classification

Sector	Number of Companies	%
Banking & Investment	31	22.00%
Industrial	62	44.50%
Insurance & Services	49	33.50%
Total	142	100.00%

This table shows the distribution of companies listed on MSM by industrial classification

Table 2: MSM Listed Companies With or Without Websites by Industrial Classification

Sector	With Website		Without Website		Total	
Banking & Investment	23	27.30%	8	14.70%	31	22%
Industrial	33	39.30%	29	47.70%	62	45%
Insurance & Services	28	33.40%	21	37.60%	49	34%
Total	84	100.00%	58	100.00%	142	100%

This table shows the companies with or without Websites

Sixty-two (44.50%) of the MSM-listed companies operate in the industrial sector. However, only 33 of the 62 companies (53%) in this sector have websites. This compares unfavorably with companies in the Banking & Investment sector, where about 74 per cent of companies have websites (23 out of 31). While, in the Insurance & Services sector 57 per cent (28 out of 49) are "websiters".

Generally, the proportion of website ownership appears low among MSM-listed companies when compared with developed western countries such as the US, the UK, Australia and New Zealand (Lymer *et al.*, 1999; Oyelere *et al.*, 2003). However, it is expected to compare favorably with those of similar countries in the Gulf/Middle East region.

Eighty-four of the 142 companies listed on the MSM have websites. However, fourteen of these companies still have their websites under construction. All the remaining 70 companies provide a variety of information on their sites. These include company history, product, financial and other information. A summary of the various types of information provided is presented in Table 3.

Table 3: Types of Information on Companies Website

Sector	Company History			Product & Services			Financial Information		
	Yes	No	Total	Yes	No	Total	Yes	No	Total
Banking & Investment	11	4	15	12	3	15	8	7	15
Industrial	30	1	31	31	0	31	12	19	31
Insurance & Services	23	1	24	24	0	24	11	13	24
Total	64	6	70	67	3	70	31	39	70

This table shows the types of information on companies' websites

Sixty-four companies provide historical/background information about themselves and sixty-seven provide product/service information. This is compared with only thirty-one companies that provide financial information at their website, indicating perhaps that IFR, being a relatively new phenomenon, is not an overly widespread practice among Omani companies. However, this result, taken on its own, may not provide us with a complete picture given that there are links to current but limited financial information about almost all the 142 MSM-listed companies at the MSM website (www.msm.gov.om).

An analysis of the nature and extent of financial information provided by the 31 companies that provided financial information is presented in Tables 4 and 5.

Table 4: Format of Publication and Nature of Published Financial Information

	Annual Reports			Financial Highlights			Both: A.R & F.H		
	PDF	HTML	MS Word	PDF	HTML	MS Word	PDF	HTML	MS Word
Banking and Investment	3	2	2	3	3	2	3	2	2
Industrial	3	4	0	5	7	0	3	4	0
Insurance & Services	10	0	0	10	1	0	10	0	0
Total	16	6	2	18	11	2	16	6	2

This table shows the format and nature of published financial information

Only 23 out of the 31 (74%) companies providing financial information do so for two-year periods or more, the other eight companies (26%) provide financial information only for one year. Of the 31 companies providing financial information, only 24 (77%) provide both annual reports and additional financial highlights, while the remaining seven provide only financial highlights. This means all 31 companies are providing financial highlights. Most (18 out of 31) of these companies provided their financial information in PDF format. Of these, 16 provided both annual reports and financial highlights, while the remaining two provided financial highlights only. Six companies provided both annual reports and financial highlights in HTML format, while another five companies used HTML in providing only financial highlights. On the other hand, MSWord was used by two companies that provided both annual reports and financial highlights.

Table 5: Number of Years and Nature of Published Financial Information

	Financial Highlight		Annual Reports		Both: A.R & F.H	
	1 Year	2Years	1 Year	2Years	1 Year	2Years
Banking & Investment	2	6	1	6	1	6
Industrial	6	6	4	3	4	3
Service	0	11	0	10	0	10
Total	8	23	5	19	5	19

This table shows the number of years and nature of published financial information

SUMMARY AND CONCLUSION

This paper has investigated and reported on the extent and nature of IFR practices among companies listed on the MSM. Given that there is hardly any piece of empirical study on IFR practices in the Middle East region, this paper is an important contribution to filling the gap in our knowledge of this subject. The paper provides a valuable insight into IFR in the Middle East that will benefit all stakeholder parties in corporate reporting. We collected and analyzed data on the 142 companies listed on the stock market in Oman. Only 84 of these companies maintain websites, of which 31 provide financial information on the sites. Majority of these companies use the PDF format to publish the financial information. Some companies also choose to use the Internet to provide additional financial information, in the form of financial highlights.

The findings of this study reveal a seemingly limited use of the Internet for financial reporting purpose in Oman. It appears that despite the growing use of the Internet as a medium for the dissemination of corporate information in other regions and countries of the world, many companies either do not have a corporate website, or are not using their website to disseminate such information. It is however possible that listed companies in Oman do not see an incremental benefit in engaging in IFR, given that the financial information of most of them is already published through the websites of the MSM (www.mam.gov.om). This should, however, not be the case, as companies should Endeavour to take control and responsibility for the information communicated to their stakeholders. Despite such links to regulator and stock exchange websites in other countries (UK, USA, Malaysia and Singapore, for example), IFR is already the norm, rather than the exception, among companies.

Perception about cost and technological expertise may be other issues limiting the widespread implementation of IFR among companies in the Middle East. However, apart from initial set-up costs, which are relatively minor, the ongoing long-term costs of operating and maintaining corporate websites for IFR purposes are minimal. The benefits to be derived from IFR in the current age of globalization and endemic market inter-linkages are likely to far outweigh the pecuniary costs. The current level of technological expertise and development in the Middle East is more than adequate for the creation, operation and maintenance of corporate websites for IFR purposes. Perhaps the "novelty" factor is the main factor responsible for the current low uptake of IFR among companies in Oman. This is likely to be generalisable to other countries in the Middle East region. If that is the case, the region is likely to witness an upsurge in IFR over the next five years and regulators and other governmental agencies, as well as other stakeholder groups will need to be prepared for this near-future development.

Currently, to the best of our knowledge, there is little by way of regulatory guidance or pronouncement on IFR in Oman and perhaps in most countries of the Middle East region. This situation needs to be remedied in advance. Regulatory guidance needs to cover issues such as the general responsibility of companies to shareholders; whether IFR is a direct substitute or complement for hard copy financial

statements that companies are required by law to provide to shareholders; rules regarding the publication of audited and non-audited financial information on the Internet; the responsibility of external auditors for audited and non-audited financial information published on the Internet (Fisher *et al*., 2003); corporate governance issues related to IFR (Oyelere *et al.*, 2006); etc. Such regulation may also aim to streamline web-reporting practices to avoid the problem of excessive variety of non-standardized practices currently available in many countries.

This is a limited and preliminary survey of IFR practices of companies listed in Oman. It may not provide an in-depth view of the variety and specifics of practices currently available in Oman. This is the subject of an ongoing larger study. Future studies may further investigate the motivation of companies that engage in IFR in region. Such investigations may focus on both internal and environmental determinants of such practices. Studies may also survey various corporate stakeholder groups, including shareholders, management, relevant governmental agencies, auditors, etc., to ascertain their perceptions of the nature and extent of IFR practices in the Middle East. The generalisability of the current study to other Middle Eastern countries may be contingent upon the results of future studies on companies in those countries. Future studies may also consider the extent of IFR uptake in governmental organizations in Oman as a critical aspect of the e-governance initiative currently being promoted by the government in Oman.

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THE BROKEN PROMISE OF PENSION FUNDS

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ABSTRACT

It's 2007, do you know where our pension is? It was part of the American Dream, a pledge made by corporations to their workers for their decades of hard work, that they would be assured of retirement benefits such as pension and health care. Now more and more companies are rescinding their promise, leaving millions of Americans at risk. Unfortunately, many companies have already been struggling with underfunding their employees' pension funds and as a result many employees are losing their pensions. The Pension Protection Act of 2006 was passed by Congress and signed by President Bush with a broad overhaul of rules. The Law gives private companies seven years to shore up funding of their traditional pensions. Special rules for seriously underfunded companies require them to pay higher premiums to eliminate their shortfall. A gradual disappearance of pensions is occurring in favor of saving accounts such as 401(k)s that require workers create their own retirement plans.

INTRODUCTION

Pensions and health care benefits were a part of the American dream. A guarantee was made to American workers by corporations that their retirement benefits would be available for them to enjoy a financially secure future when they retire. Now many companies are reducing or eliminating programs leaving millions of American workers at risk financially. Since the United States Bankruptcy Court in 2005 approved United Airlines' request to terminate its employees' pension plans, the once secure road to retirement took a turn for the worst (Randall, 2002). This is not the first time pension plans have been in the spotlight; years ago the Steel industry cut benefits as a way to avoid bankruptcy. It is apparent that the auto industry is following the same route. In 2005 United Airlines was the largest pension default in airline history (Randall, 2002). It indicated the possible formation of a future trend towards ending employer support for retirement pensions. Corporations that have formed in recent years including Google, JetBlue, Microsoft, Dell, and Starbucks have elected to never offer traditional pension plans (Colvin, 2006). Other companies such as IBM, Motorola, Sears, Hewlett-Packard, and Verizon have frozen all pension plans ending the security of a lifetime pension to their employees (Walsh, 2006).

The consequences of pension plan ending are beneficial to corporations so that they can earn a profit. However, without pensions the American worker is forced to provide their own resources for retirement. With a growing elder population and decreased access to healthcare for senior citizens retired workers no longer have the luxury of having an income from pension and healthcare coverage.

HISTORY AND THE RECORD OF FAILURE

After the Civil War, the federal government formulated the first large pension plan. It included both Union Army war veterans and war widows (Lowenstein, 2005). In 1890 Congress approved a plan to extend pensions to include all veterans 65 or over. States and cities followed giving pensions to police officers and firefighters (Lowenstein, 2005).

By World War I teachers were given pensions as well. A form of social welfare, Governments were able to offer stability through pensions while keeping salaries low. The first private company pension was offered in 1875 by American Express, a stagecoach delivery service (Lowenstein, 2005). Soon after

railroads followed instituting pension plans. To qualify, workers were required to complete thirty years of work in order to collect a pension (Lowenstein, 2005). Management regarded pensions as a tool to retain workers rather than an employee benefit.

World War II provided an opportunity to further encourage pensions. Combined with the creation of tax plans pensions became an attractive way to limit taxation. The overall effect presented a tremendous opportunity for unions to force employers to give pensions to their workers.

Back in the 1940's, Alfred P. Sloan, Jr. of General Motors, warned that pensions and other benefits would be extravagant beyond reason for the auto industry to provide (Lowenstein, 2005). Nevertheless, John L Lewis, the well known labor leader, led a strike and won a pension for miners. In 1949, Ford Motor Company surrendered to the demands of the United Auto Workers UAW union by granting pensions to workers. In 1950 a reluctant Alfred P. Sloan, Jr. allowed the creation of a pension plan for General Motors (Lowenstein, 2005). A frenzied rush into the creation of plans occurred. By 1960, 40% of private sector workers were given pensions (Lowenstein, 2005).

Unfortunately, many companies have already been struggling with a big deficit in their employees' pension funds. As a result many employees are losing their pensions. The promises that have been made to them for ten, twenty, and thirty years are now being broken by some of the largest corporations. Table 1 lists the time line for bankruptcy for several major corporations that have broken their pension promises including Enron, Worldcom, Bethlehem Steel, United Airlines, Delta Airlines, Northwest Airlines, Delphi, and Dana Corporations. These underfunded pension liabilities approach $14 billion dollars from a single firm according to the Pension Benefit Guaranty Corporation (www.pbgc.gov, 2006).

Table 1: Timeline of Bankruptcy of Major Corporations

Firm	Bankruptcy Date
Bethlehem Steel	10/15/01
Enron	12/02/01
Worldcom	7/21/02
United Airlines	12/09/02
Delta Airlines	9/14/05
Northwest Airlines	9/14/05
Delphi	10/08/05
Dana	3/03/06

Source: New Generation Research, Inc. (www.BankruptcyData.com, 2006)

The trend of filing for bankruptcy has escalated since 2001 as the airline industry suffered losses from the September 11 terrorist attacks. For example, in the attack United Airlines lost two airplanes. Enron and Worldcom were forced to file for bankruptcy after their accounting scandals erupted. Declining car sales have caused Dana Corporation and Delphi Corporation to suffer. The underfunding of pensions is tied to the downfall of the stock market beginning in 2000, lower interest rates, and insufficient funding of post retirement benefits.

PBGC PENSION BENEFIT GUARANTY CORPORATION

The Pension Benefit Guaranty Corporation, PBGC created under ERISA, guarantees payment of basic pension benefits to millions of American workers and retirees participating in private sector defined benefit plans (Enzi, 2006). The agency receives no funds from general tax revenues. Operations are financed largely by insurance premiums paid by companies that sponsor pension plans and PBGC investment returns (Government Media News Archive, 2002). Until 2001 PBGC had a surplus and was able to cover any deficiency in underfunded plans. Combined with a lack of fully funding post retirement benefits by employers, the value of fund assets fell below liabilities resulting in underfunding of pension

and post retirement benefit plans. Presently PBGC has an estimated $23 to $30 billion deficit (Baker, 2006). PBGC has experienced huge deficits caused by the default in recent years by several large defined benefit pension plans and the fall in values of investment returns on PBGC plan assets

Table 2: Top Ten Firms Presenting Claims against the PBGC for Single Employer Program (1975-2005)

Firm	Number of Plans	Fiscal Year(s) of Plan Termination(s)	Claims (by firm)	Vested Participants	Average Claim Per Vested Participation	Percent of Total Claims (1975-2005)
United Airlines	4	2005	$7,093,803,951	122,541	$57,889	22.7%
Bethlehem Steel	1	2003	$3,654,380,116	97,015	$37,668	11.5%
US Airways	4	2003, 2005	$2,861,901,511	58,823	$48.653	9.0%
LTV Steel*	6	2002, 2003, 2004	$1,959,679,993	80,961	$24,205	6.2%
National Steel	7	2003	$1,161,019,567	35,404	$32,793	3.7%
Pan American Air	3	1991, 1992	$841,082,434	37,485	$22,438	2.7%
Weirton Steel	1	2004	$690,181,783	9,196	$75,052	2.2%
Trans World Airlines	2	2001	$668,377,105	34,257	$19,511	2.1%
Kemper Insurance	2	2005	$566,128,387	12,221	$46,324	1.8%
Kaiser Aluminum	3	2004	$565,812,015	17,591	$32,165	1.8%
Top Ten Total	33		$20,062,366,861	505,494	$39,686	63.3%
All Other Total	3,552		$11,646,148,178	1,178,762	$9,880	36.7%
Total	3,585		$31,708,515,039	1,684,256	$18,826	100.0%

*This table shows the Top Ten Firms Presenting Claims against the PBGC for Single Employer Program, (1975-2005). Sources: PBGC Fiscal Year Closing File (9/30/05), PBGC Case Administration System and PBGC Participant System (PRISM). Due to rounding of individual items, percentages may not add up to 100%. Data in this table have been calculated on a firm basis and include all plans of each firm. Values and distributions are subject to change as PBCG conducts its reviews and establishes termination dates. * Does not include 1986 termination of a Republic Steel plan sponsored by the LTV.*

With the threat of financial insolvency of the PBGC, Congress had little choice but to step in and arrange a financial bailout of the agency. Several years of falling interest rates and declining stock prices and the termination of several large unfunded pension plans lead to a rapid deterioration of the PBGC 's financial position. Table 2 lists the 10 largest claims filed with the PBGC. Nine of the ten largest pension plan claims occurred between 2001-2005. The airline and steel industries account for eight of the ten highest claims.

Weaknesses in Pension Law Requirements

The primary weaknesses of the former pension law requirements are (Congressional Research Service 2006): 1) The sponsors or firms participating in underfunded plans were not required to make additional contributions if their plans were at least 90 per cent funded, 2) Interest rates used to calculate pension plan liabilities were averaged over four years and asset values used to calculate minimum funding could be averaged over five years resulting in neither plan assets nor liabilities being measured accurately, 3) Underfunded plans that increased benefits under the plan could be amortized over thirty years creating shortfalls, 4) Some sponsors or firms of underfunded pensions could avoid making payments for several years because they had made contributions beyond the minimum in the past called "credit balances", 5) As the Federal Reserve reduced interest rates to low levels, equities or stock values of companies fell, PBGC investment returns also were reduced. The possibility that the termination of defined benefit pension plans with large unfunded liabilities might lead to the insolvency of PBGC created in 1974 contributed to pension reform and the enactment of the Pension Protection Act of 2006.

PENSION PROTECTION ACT OF 2006

On August 16, 2006, President Bush and Congress signed into law the most extensive revision of the nation's pension law in three decades (Baker, 2006). The new law is aimed at restoring stability to company pensions. This law is the most comprehensive reform of the U.S. pension laws since the Employment Retirement Income Security Act of 1974, ERISA, enacted over thirty years ago

(Congressional Research Service 2006). ERISA is the Employees Retirement Income Security Act of 1974. This act established the basic requirements for employee benefit plans. The authority for enforcing ERISA is divided between three federal agencies, the Internal Revenue Service, IRS, the Department of Labor, DOL, and the Pension Benefit Guaranty Corporation, PBGC.

The new law identifies troubled pension plans, helps to stabilize the plan before employers resort to bankruptcy, increases minimum funding requirements of their pension plans, and strengthens the Pension Benefit Guarantee Corporation - the pension provider of last resort. A plan is considered to be fully funded if there are enough assets to cover the liabilities of the pension plan which includes pensions and health benefits. The PPA uses the tax law allowing a higher limit on employer contributions that are deductible while requiring higher funding levels in order for sponsor or firms participating to continue a qualified plan tax status (Congressional Research Service, 2006). The law requires private sector companies to fully fund defined benefit plans over seven years (Baker, 2006). The law attempts to close loopholes by forcing companies to pay higher premiums to PBGC if underfunding occurs. Funding provisions of the new law will not take effect for two years. (Baker, 2006) The airline industry and certain government contractors were given a break by allowing extension of time for the repayment of any underfunding in their pension plans.

Along with addressing pensions, the Pension Protection Act stipulates requirements for defined contribution plans including 401K's and IRA's. It appears that the funding requirements will tend to push companies toward dropping traditional pensions in favor of employee financed 401K and IRA plans. The new law allows companies to automatically enroll workers in 401K programs which could help to increase workers savings for retirement.

What Does The Pension Protection Act of 2006 Do?

In order for a plan to be fully funded the assets must be sufficient in dollars to cover the liabilities of the plan. The PPA of 2006 makes various pension plan changes. The changes affect different types of pension plans in different ways. For example, single employer plans have different requirements than multi-employer plans.

Single Employer Plan: A single employer defined benefit plan is an employer sponsored retirement plan where employee benefits are prefunded and plan assets are held by a trustee in a fund controlled by the employer. Benefits are paid to retirees from the fund by the trustee. The employer is responsible for the investment risk.

The new Pension Protection Act of 2006 establishes new stricter funding requirements for single employer defined benefit pension plans effective January 1, 2008. Under the prior law, plans were generally funded on a 90% funding target. Under the Pension Protection Act of 2006, the funding target is increased to 100% within a seven year period to fund the targeted amount. This provision strengthens traditional pension plans by insuring that there are funds available to pay benefits as well as protect the Pension Benefit Guaranty Corporation.

Multi Employer Plans: Multi employer defined benefit plans are agreed upon plans of several employers in similar industries and usually with labor unions. These defined benefit plans are subject to funding requirements different from single employer defined benefit plans. Funding requirements for multi employer plans were established before the Pension Protection Act of 2006 was enacted. The PPA has formulated a new set of rules for improving the funding of multi employer plans that are identified as being "endangered" or "critical".(Congressional Research Services 2006). Currently any new underfunded past service liabilities are funded over a 30 year period. Beginning in 2008 the funding period will be reduced to 15 years.

Hybrid Plans: Hybrid and cash balance plans are insured by the PBGC. Rather than leave employees with no pension plan at all, some employers have been opting for hybrid or cash balance plans. These plans are part pension and part savings plans. The defined benefit pensions under single employer plans is as stated under single employer plans. The savings plan under defined contribution does not require any funding. The risk assessment remains with the employer with the employee not being at risk. No additional funding requirements are mentioned in the Act.

Defined Contribution Pension Plans

The new law addresses retirement savings in 401(K) and IRA plans. Effective immediately, federal laws preempt all state laws that prohibit automatic enrollment of employees. Risk assessment in these plans eliminates employer risk. The employee has all the risk for their Investment choices. By introducing new and improved rules and expanding benefits scheduled to expire after 2010, PPA offers improvements to encourage interest in these plans.

Highlights include: 1) Enrollment of employees in the plans is automatic. Employees must opt out in order not to participate, 2) Investment advice and personalized service are available, 3) IRA's and tax refunds can be split by the employee and directed to deposit in three bank Accounts, 4) Military and Public Service personnel of individuals called to active duty can make penalty free early withdrawals from their 401(K) or IRA's, 5) 401(K) hardship withdrawals will be allowed, 6) Non-spouse beneficiaries will be allowed tax free rollovers into IRA's by beneficiaries, 7) Direct Plan to allow Roth IRA rollovers will be available, and 8) charitable donations include tightening of rules requiring documentation and proof of items donated and the expansion of opportunities for giving.

Defined Benefit Pension And Defined Benefit Post Retirement Plans (Healthcare Etc) Single Employers

The Pension Protection Act will also require stricter funding requirements to extend to both defined benefit pension plans and defined benefit post retirement plans including healthcare. With regard to risk assessment- the employer has all the risk. The employee has no risk. Other issues include the key elements in using an actuary determination to include: 1) Employers obligation to pay retirement benefits in the future, 2) Plan assets given to a trustee by the employer from which retirement benefits will be paid in the future to retirees, 3) Periodic expense of having a pension plan and 4) As of December 15, 2006, any company with a calendar year ending December 31, 2006 or a fiscal year .ending thereafter must follow new Financial Accounting Standards Board #158 requirements to report any overfunded asset or underfunded liability in the statement of financial condition [balance sheet]. Employers obligation and plan assets have not been previously reported in the financial statements, but have been disclosed in the footnotes of the financial statements.

FASB FINANCIAL ACCOUNTING STANDARDS BOARD

The FASB, Financial Accounting Standards Board is the independent rule making body for financial accounting that reports to the Securities and Exchange Commission. The FASB Financial Accounting Standards Board sets the US accounting rules (Chasan, 2006) is authorized to issue Statements of Financial Standards and other authoritative pronouncements representing official positions on generally accepted accounting principles (GAAP) and financial reporting requirements.

FASB has issued statement No.158 employers accounting for defined benefit pensions and other post retirement benefits amending previous statements #87,88,106, and 132R, (FASB, 2006). The rules will apply to single employer defined benefit plans and to certain not for profit organizations as well. The new rule requires a recognition on the statement of financial position (balance sheet) of an asset for a

plan's overfunded status or a liability for a plan's underfunded status (FASB, 2006). Although underfunding was previously disclosed in footnotes to financial statements, it was not fully recorded or included in the figures reported on financial statements. Now it will be required by the new FASB Financial Accounting Standard requirement No. 158 issued September 29, 2006 (FASB, 2006). The requirement will be effective for fiscal years ending after December 15, 2006 (FASB, 2006). Thus, companies following a calendar year must report the change in the 2006 financial statements (Chasan, 2006).

Analysts predict some companies will have to increase recorded liabilities greatly, and some may have shareholders equity or net worth wiped out (Chasan, 2006). Some of the biggest changes in balance sheets of companies like General Motors, Ford Motor Company, Goodyear Tire and Rubber Co., and Exxon Mobil Corporation which have some of the largest US pension and other post-retirement benefit plans is likely to occur (Chasan, 2006). The new accounting standard FASB No.158 requirements and the Pension Protection Act of 2006 are likely to result in major changes in defined benefit pension fund and post retirement accounting.

Financial Accounting Standards Board, FASB No. 158 Accounting for Defined Benefit Pension and Other Post Retirement Plans

This statement requires single employer defined benefit plans to recognize the funded status of both its benefit plans measured as the difference between plan assets at fair value and benefit obligation (liability) actuarial present value in its statement of financial position (balance sheet) as at the end of their calendar or fiscal accounting year. The example below presents how to report overfunded assets and underfunded liabilities. In the first case the fair value of the asset plans at the end of the year is 50 billion dollars minus the benefit obligation or liability of 10 billion dollar leaving an overfunded asset of 40 billion to be reported as an overfunded asset in the financial statement. In the second case the fair value of the asset plan at the end of the year is 20 billion dollars with a benefit obligation or liability of 40 billion dollars at the end of the year leaving an underfunded liability of 20 billion dollars to be reported as an underfunded liability in the financial statement. Reporting these figures in the financial statements is a new requirement of FASB No. 158 whereas these figures were previously estimated and reported as a footnote to the financial statement.

Example

Fair value of asset plans at year end	50 Billion
Benefit obligation (liability) at year end	10 Billion
Overfunded Asset	40 Billion
Reported as an asset in the financial statement	

Fair value of asset plan at year end	20 Billion
Benefit obligation (liability) at year end	40 Billion
Underfunded Liability	20 Billion
Reported as a liability in the financial statement	

Public Pension Plans

Public pension plans include state and local pension plans. These plans are not like the private sector pensions plans covered by the recently enacted Pension Protection Act of 2006. State and local plans, known as public pension plans, are facing an estimated huge funding gap of $300 billion to $700 billion (McKeon, 2006). These plans include state and local pensions. The plans are not like the private sector pension plans covered by the Pension Protection Act of 2006. The federal government is not responsible for the regulation of public pension state and local plans. The Internal Revenue Code IRC 412 H (IRS,

2006) exempts all governmental employers such as state and local Governments as defined in Internal Revenue Code IRC 414D (RSM McGladrey, 2006) from funding requirements. Pension plans of state and locals are not held to the same federal standards as private sector plans. The federal government is not responsible for the regulation of public pension state and local plans. The crisis in public pensions underfunding is real, but state and local funding is not covered or protected by the Pension Protection Act of 2006, a law enacted to protect private sector funding only. Public pensions of state and local funds are an issue that has not yet been addressed.

Ways to Improve The Pension Protection Act of 2006

The enactment of the Pension Protection Act of 2006 has not solved all the pension reform problems. Expansion of the tax saver's credit to include all qualified taxpayers is an area that should be addressed. Tax saver's credits are a deduction on the tax return after the taxpayer calculates how much federal income tax is owed. Tax saver's credits are subtracted from the amount of income tax owed to the IRS by the taxpayer.

The Tax saver's credit was due to expire under the Economic Growth Reconciliation Act of 2001 EGTRR at the end of 2006, but was made permanent by the PPA of 2006. Carrying forward, the retirement savings tax credit (also called the saver's credit) appears on Form 8880 Credit For Qualified Retirement Savings Contribution and on Form 1040 and 1040A Tax Returns for 2006. This rewards low and middle income wage earners who save for retirement. The tax law allows a qualified taxpayer to contribute up to $4000 in 2006 ($5000 if you are age 50 or older) to their IRA or 401 K accounts with a deadline of April 17, 2007 for 2006 return contributions. Of that contribution, only $2000 will count in figuring the tax saver's credit. Applying the allowable rates to the $2000, a maximum $1000 tax credit is allowed. Although allowable contributions and income levels are indexed for inflation in 2007, the result is the lower the income, the larger the tax credit allowed. Again this is of benefit to lower income taxpayers only. However, making a $2,000 contribution at a low level of income is not economically feasible. The PPA of 2006 needs to be expanded to encourage qualified taxpayers at all levels of income to invest and save by giving them a sizable tax break by increasing the tax saver's credit, increasing both contributions allowed and maximum income levels to determine eligibility.

Clearly, if pensions plans are being eliminated and 401 K's and IRA's are becoming the retirement savings plan preference, more incentives have to be made available to encourage all workers to save for retirement. It is a known fact that Americans do not save. Part time and seasonal as well as full time employees should be allowed to participate in employer sponsored retirement savings plans. Further focus of the PPA should include expanding investment education planning for workers. In order for people to successfully plan for retirement they need both education, advice and help in selecting investments.

ISSUES FOR FUTURE RESEARCH

Profit sharing is not a new idea. It has been generally unsuccessful in American Industry. The failure of profit sharing has usually been attributed to frustration and resentment when profits vary each year, fall, and often turn to losses. Also unions have historically been opposed to profit sharing plans. (Fosbre, 1984)

Generally abandoned after the Great Depression, workers feared that a promise of a bonus based on profits was in fact an excuse for a low wage; an anti union policy. As a result, when unions became strong in the manufacturing area after 1940, union leaders proposed fixed fringe benefits rather than profit sharing (Allen, 1997).

The Employment Retirement Income Security Act of 1974 passed to protect retirement plan participants included the establishment of an Employee Stock Ownership Plan. Retirement plans were simplified by the Revenue Act of 1978 which established the 401 K Retirement Plan. While each of the legislative changes addressed different levels of profit sharing plans, the general focus shifted from defined benefit to defined contribution plans (Allen, 1997).

While a great deal of attention has focused on defined benefit plans in the Pension Protection Act of 2006 and FASB #158 Accounting Requirements, it appears that a far more reaching impact will be on defined contribution plans with profit sharing and 401 K plans already in place.

Unions could well position themselves to embrace profit sharing plans as a replacement for lost pensions. By giving employees stock for outstanding profit performance companies are able to provide security to the worker so they are able to obtain the benefits of what would constitute a pension without putting a severe financing burden on the organization. A major benefit, more understandable today, is that when an employee becomes an owner of company stock, their interest in profit performance is increased dramatically. This becomes a huge benefit to both the employee and the company.

After an employee has become vested, another option is to allow diversification from company owned stocks into stocks of other companies. This would avoid the decimation of retirement accounts and avoid a situation similar to what happened in Enron's collapse. These are some suggestions for consideration in dealing with issues on pension reform.

Starbucks is an example of a company that has never offered a pension. They have offered profit sharing as well as a retirement savings plan. This is a company that has become highly profitable and successful. Its employees are content with their benefits. These are some suggestions for various issues dealing with pension reform.

LIFE'S LESSON: SAVE, INVEST AND DEPEND ON YOURSELF

The PPA of 2006 and FASB No. 158 both recognize the evolution occurring in worker's benefits. Corporations that have formed in recent years including Google, JetBlue, Microsoft, Dell, and Starbucks have elected to never offer traditional pension plans (Colvin, 2006). The warning that pensions and other benefits would be "extravagant beyond reason" (Lowenstein, 2005) expressed by Alfred P. Sloan, Jr., in the 1940's has proven to be correct. Sloan's idea reinforces the financial threat for firms with pension plans creating a competitive advantage for those firms who never offer these extravagant benefits that greatly reduce profits. In today's society, where according to the Bureau of Labor Statistics an average American worker holds ten jobs between ages 18 and 38, (Colvin, 2006) making the concept of working for one employer for 30 years to earn a pension not realistic. The gradual disappearance of pensions in favor of 401(K)'s and IRA's which require workers to amass their own retirement savings represents a major change in pensions and retirement benefits in the U.S. for the American worker.

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ACCOUNTING TRANSPARENCY FOR POST RETIREMENT BENEFITS: COULD THE NEW FASB STANDARD RESULT IN NEGATIVE EQUITY?

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ABSTRACT

The Financial Accounting Standards Board (FASB) issued a new standard, Statement of Financial Accounting Standards (SFAS) No. 158, Employers' Accounting for Defined Benefit Pension and Other Postretirement Plans, on September 29, 2006, which is an amendment of FASB Statements No. 87, 88, 106, and 132R. This new standard may drastically impact stockholders' equity for many companies and possibly even cause it to be negative.

INTRODUCTION

SFAS 158 is the first phase of the Board's comprehensive project to improve the reporting and accounting for defined benefit plans and other postretirement benefits. Phase 2 of FASB's project will address the measurement and recognition issues that will affect the amount of pension expense on a company's income statement. This new standard requires companies to account for their pensions and other postemployment benefits (OPEB) in a way that could potentially change the equation as we know it for some companies. SFAS 158 requires that a company recognize, as an asset or liability, the full underfunded or overfunded status of its benefit plan in its 2006 year-end balance sheet. For most companies this new treatment will cause an increase in liabilities. The offset to any increase in pension liability will be to an equity account, accumulated other comprehensive income (AOCI) rather than to the income statement under this new standard. Hence, for some large companies, the decrease in equity will exceed the current balance, resulting in a negative equity balance. Thus, the impact of pension reform could be more profound than expected.

Pension reform has been the subject of lively debate in Washington, which led to the Pension Protection Act of 2006 on August 17. The pension/healthcare crisis is twofold: the *first issue* is the actual funding of postemployment benefits and the *second issue* is the reporting of such benefits in the financial statements. The magnitude of the actual underfunding of pensions and OPEB is evidenced by the fact that the Pension Benefit Guaranty Corporation (PBGC), which was created in 1974 to help guarantee companies' pension plans, has a deficit for 2005 of $22.8 billion (Adams 2005). In recent years, the PBGC has had to assume the pension obligations of several large, insolvent companies. Furthermore, the Government Accountability Office estimates that the country's pension plans total $600 billion in the red (Cheney 2006). Moreover, this figure does not include the cost of other post employment benefits such as healthcare. Underfunded pension plans did not truly come into the limelight until the stock market fell at the end of 1999, and interest rates also declined. Companies were then caught in a situation where the actual return on plan assets was dramatically less than their actuarial assumptions.

The second issue is the financial *reporting* implications of pensions and OPEB. Historically, FASB has attempted to address postemployment benefit issues in the corporate financial statements. Unfortunately, compromises were made that resulted in minimal inclusion in the balance sheet with mainly footnote disclosures. This treatment does not appear to be a huge problem for a sophisticated financial statement reader. However, the Securities and Exchange Commission (SEC) conducted a study in 2005 and concluded that transparency and comparability are an issue in the accounting for pensions and OPEB

(Milliman, 2005). As a result the FASB has issued SFAS 158. Even though it is Phase one of FASB's project and typically affects only the balance sheet, it could have a dramatic impact for some companies.

LITERATURE REVIEW

For financial information to be useful, it must be understandable to reasonably informed users. Prior to SFAS 158 it was fairly difficult for average users to look at a company's balance sheet and be able to know the full extent of its liability for its pension plan and OPEB. Generally accepted accounting principles did not require companies to disclose the funded status of the plan (the difference between the projected benefit obligation and the fair value of the plan assets at the end of the year) in the corporate financial statements. In accordance with Statement of Financial Accounting Standards No. 87, *Employers' Accounting for Pension Plans* (SFAS 87) and Statement of Financial Accounting Standards No.106, *Employers' Accounting for Postretirement Benefits Other than Pensions* (SFAS 106), companies are allowed to use smoothing techniques that have the effect of delaying the recognition of certain retirement benefit costs such as changes in actuarial assumptions and plan amendments. In addition, the balance sheet reflected "net" reporting prior to SFAS 158's implementation. If the contributions to the pension plan for the year exceeded pension expense, then a "prepaid" pension asset was reflected on the balance sheet even though the pension plan may in fact have been underfunded. Moreover, as indicated in the Wall Street Journal (Schultz, 2004) analysts were concerned that some companies may have used unrealistically high discount rates, which underreported the present value of their future pension obligations.

Under SFAS 87, companies can reduce pension expense for the *expected* return on plan assets (even if their assumptions are unrealistic) rather than the *actual* return on those assets (one of the smoothing techniques noted earlier under the current accounting for pensions). When actual returns diminish as they did after 1999 and prior to 2004, companies could conceivably record a pension profit (reduce the expense) based on their expected return even if their actual return on plan asset declined during the period. Although plan assets have recorded actual gains in 2004 and 2005, the gains have not been large enough to prevent the increase in pension expense that companies are incurring. Because of perceived abuses by some companies, the SEC began to aggressively question management's assumptions with regard to their expected returns on plan assets. As a result, companies have had to use more realistic discount rates in recent years, which have also increased pension liabilities.

Pension and OPEB information contained in financial statements prior to SFAS 158 implementation was neither complete nor transparent. Some postretirement benefit accounts were maintained "off balance sheet". The funded status of a company's benefit plan was buried in the footnotes to the financial statements, and without very carefully reviewing the notes to the financial statements, users may not recognize a continually growing pension liability. Furthermore, SFAS 87 and SFAS 106 include many compromises to eliminate volatility and require overly complex computations. Since SFAS 158 does not affect the income statement, it will not affect most financial ratios. Published debt to equity ratios, called the leverage ratio, typically includes debt and excludes other liabilities including retirement obligations. However, lenders in their loan covenants also include the more typical definition of total liabilities divided by total stockholders' equity, which is sometimes called the debt to book value ratio. This ratio would be affected by this new accounting standard.

Recording the full liability for pensions and OPEB may require resetting some financial ratios including the debt-to-book value ratio, which lenders, investment bankers and investors use to evaluate companies. Although these additional liabilities may impact existing loan covenants, the reality is that lenders will probably agree to modify the covenants so that companies are still in compliance based on the argument that these liabilities have already been previously disclosed in the footnotes. Lenders may initially downplay the impact of this accounting change because to do otherwise would be an admission on their

part that they may not have fully understood the implications of the retirement footnote. However, it is safe to assume that lenders will subsequently have much greater concern in lending to companies that show a diminished or negative stockholders' equity.

The new Pension Protection Act of 2006 and SFAS 158 have added to the momentum of declining defined benefit pension plans and the movement towards defined contribution plans such as 401(k)s, particularly with the currently mobile workforce. "These findings are a wake-up call," said John Morrow, Vice President of the AICPA's division for CPAs in business and industry. "The traditional system of rewarding employees with pensions after long years of service is on its way out, because companies simply cannot bear the cost. Therefore, employees will have to find alternate methods of funding their retirement."

FASB ADDRESSES PENSION AND HEALTH CARE COSTS

In response to demands for more relevant and complete information regarding pension plan obligations, the FASB issued SFAS 158 on September 29, 2006, which amends Statements of Financial Accounting Standards Nos. 87, 88, 106, and 132R. (The complexities of this new standard, such as the treatment of transition obligations, are beyond the scope of this article.) As stated by the FASB, "The Board has issued this Statement to address the concern that existing standards … fail to produce representationally faithful and understandable financial statements". The objective of the statement is to make postemployment benefit information more complete, useful, understandable, and transparent for investors, creditors, retirees, donors and others. This statement will require companies to report the "current economic status" as to whether a plan is overfunded or underfunded in its balance sheet rather than a footnote reconciliation of pensions and OPEB. SFAS 158 is effective as of the end of the fiscal year ending after December 15, 2006, for entities with publicly traded equity securities, and at the end of the fiscal year ending after June 15, 2007, for all other entities.

As mentioned, FASB's plan to make pension accounting reflect reality will be done in *two phases*. Phase No. 1 resulted in SFAS 158. Phase No. 2 beginning in 2006 has an estimated completion date of 2009 or 2010. Phase No.1 does not change how pension plan assets and benefit obligations are measured nor does it change the basic approach for measuring pension expense. Rather, Phase 1 concentrated on the balance sheet implications of fully recognizing the funded status of defined benefit plans and OPEB. Therefore, this new standard has virtually no impact on a company's results of operations or cash flows. Phase No. 2 of the project, which FASB expects to collaborate with the International Accounting Standards Board, will address measurement and recognition issues related to changes in the fair value of plan assets and the benefit obligation.

METHODOLOGY

To estimate our amounts above, the authors followed the guidance provided by Deloitte (2006) per the above illustrative example journal entry. We documented the amounts and sources of the off-balance sheet accounts and then determined whether the unrecognized amounts were from prior service, deferred actuarial gains and losses or from transition obligations. We also totaled the unrecognized amounts by plan source: U.S. pension plans, non-U.S. pension plans, and OPEB. The net pension liability is recorded as a liability on the balance sheet now and previously deferred amounts are charged to AOCI.

IMPACT ON CORPORATE FINANCIAL STATEMENTS

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It is important to note that as previous mentioned changes made to the balance sheet under SFAS 158 will not pass through the income statement but rather are recorded as a charge or credit to AOCI, thereby directly impacting shareholders' equity. Typically, companies will see more of an impact on their

shareholders' equity if they have an asset on their books relating to their pension plan which must be eliminated before recording the actual retirement plan liability.

Illustration

Assume under SFAS Nos. 87 and 106, the XYZ Company had the following year end balances related to its pension plan (all previously required footnote disclosures):

Underfunded status of pension plan	$400 Million (*To be Recorded*)
Unrecognized prior service cost	$200 Million (*Off balance sheet account*)
Net actuarial loss	$250 Million (O*ff balance sheet account*)
Unrecognized transition obligation	$ 50 Million (*Off balance sheet account*)
Prepaid Accrued Pension Cost	$100 Million (*Asset on Balance Sheet*)

Assuming a 40% tax rate, the journal entry required under the new rules would include:

Deferred Tax Asset	200,000,000 *	
Acc Other Comprehensive Income (AOCI)	300,000,000	
Pension Liability		400,000,000
Prepaid Accrued Pension Cost		100,000,000

**Unrecognized prior service cost of $200 million + $250 million of net actuarial loss + $50 million of unrecognized transition obligation = $500 million * 40% tax rate = $200 million. Guidance provided by Deloitte (2006).*

As indicated by the above entry, stockholders' equity (AOCI component) would decrease by $300 million, which represents the unrecognized prior service cost, actuarial losses and unrecognized transition obligations while liabilities would increase by $400 million and assets would increase by $100 million (net). Note that XYZ Company went from recording a $100 million pension asset to recognizing a $400 million pension liability.

To put this into perspective, according to Milliman's (2005) study of 100 large U.S. corporations that sponsor defined benefit pension plans, if this standard which requires recording a liability for pensions and OPEB had been in effect for 2005, stockholders' equity would have been decreased by $222.2 billion! In addition, the previously unrecorded OPEB liability would also be recorded and further reduce stockholders' equity. It is important to note that as previously stated the adjustment required under the new rules does not directly impact corporate earnings.

This new standard was issued in September 2006. Although the implementation date is December 15, 2006, possible results for some companies are illustrated below. If the following companies were to fully record the liability required for their pension plans and other postretirement obligations (i.e., health care and life insurance), our estimate of the potential impact on stockholders' equity based on the information provided in the 2005 Form 10K footnotes. We have assumed a 40% tax rate (35% corporate and 5% state) for the following companies for illustrative purposes. (Of course, many assumptions could be updated or changed which would lead to different potential results from this SFAS 158 implementation.)

CORPORATE AMERICA RESPONDS

Comment letters received by the FASB while this standard was still an Exposure Draft voiced objections to the proposed standard. One of the strongest objections was the use of the Projected Benefit Obligation, which incorporates future pay raises into the liability calculation, rather than the currently used Accumulated Benefit Obligations which does not and therefore results in a lower liability calculation.

Table 1: Potential SFAS 158 Impact If Implemented for 2005 (Millions of dollars)

Company	2005 Stockholders' Equity *BEFORE* SFAS 158	2005 Stockholders' Equity *AFTER* SFAS 158	Stockholders' Equity % Change in
Ford	12,957	($895)	(107%)
Boeing	11,059	2,997	(73%)
IBM	33,098	18,210	(45%)
Lockheed	7,867	4,599	(42%)
Federal Express	9,588	8,055	(16%)
Raytheon	10,709	9,249	(14%)

As mentioned, the PBGC and the SEC were previously concerned that some companies used overly optimistic assumptions when calculating their expected return on plan assets. With this liability adversely affecting a company's net worth, the possibility remains that if these retirement liabilities are significant, there may be companies who will employ unrealistic assumptions to understate the amount of their liability obligations. There are a number of assumptions including the discount rate that could vary. Changes in assumptions could increase or decrease the impact of implementing SFAS 158. One example might be underestimating future increases in either salary levels or healthcare costs that are used to calculate the costs of defined benefit plans, which would thus reduce a company's retirement liability on the balance sheet. According to Beck 2006, "Investors can see that information in the pension footnote found in the annual report, where companies give the rate of compensation increase for the past few years. It should raise a red flag if that rate differs from the trend seen in the past, or from what competitors show."

As stated earlier, some of the more sophisticated financial statement users are commenting that the change from a footnote disclosure to a recognized liability on the balance sheet should not be an issue. However, the reality is that recording these liabilities on the books now will significantly decrease stockholders' equity and in some cases cause a company's stockholders' equity to actually be negative, which may have an effect on their ratings and investor confidence.

ACTUAL IMPACT ON SPECIFIC COMPANIES AS OF DECEMBER 31, 2006

How does the implementation of SFAS 158 look like for actual companies as of December 31, 2006? A search of the following companies' recent financial disclosures on EDGAR revealed the impact to their stockholders' equity as a result of implementing this new accounting standard.

Table 2: SFAS 158 Impact for 2006: Stockholders' Equity Decrease *

Company	2006 Change in Stockholders' Equity from SFAS 158 Implementation (Millions of dollars)
Boeing	($6,509)
IBM	($9,498)
Lockheed	($3,069)
Raytheon	($1,338)

** Actual implementation results for Ford and Federal Express were not available. SFAS 158 is effective for FedEx and FedEx Express as of May 31, 2007.*

An examination of the percentage decrease in stockholders equity (AOCI) for the above companies resulting solely from the actual implementation of SFAS 158 is more revealing.

Table 3: SFAS 158 Impact for 2006: Stockholders' Equity Percentage Change (Millions of $)

Company	Stockholders' Equity BEFORE SFAS 158**	Stockholders' Equity AFTER SFAS 158	Stockholders' Equity % Change
Boeing	11,248	4,739	(58%)
IBM	38,004	28,506	(25%)
Lockheed	9,953	6,884	(31%)
Raytheon	12,439	11,101	(11%)

*** Methodology: Stockholders' Equity as of December 31, 2006 adding back SFAS 158 implementation adjustment.*

IMPLICATIONS OF ASSUMPTIONS USED BY COMPANIES

Actuarial firms are typically used to compute expense and income for a company's benefit plans. Many actuarial assumptions are used in estimating pension expense or income. These assumptions include the discount rate, the long-term rate of return on plan assets, rates of increase in future compensation levels and mortality rates. Each company determines their own rate of compensation increases, based upon its long-term plans for such increases. Mortality rates are updated periodically based on the actual experience of a company, and assumptions are based on life expectancy and death rates for different types of participants. The amount and timing of expected contributions to plans and benefit payments to plan participants can also make a difference in a company's calculations. Since assumptions can have a material impact on the valuations, investors need to carefully read the pension footnotes for any changes in assumptions to understand their impact on financial statements.

A partial explanation for the fact that 2006 SFAS 158 implementation results for Lockheed might look a bit different from projected results for the previous year includes but is not limited to the fact that Lockheed increased their discount rate assumption to 5.875% at December 31, 2006, compared to 5.625% used at the end of 2005. This change, together with other factors such as the effects of the actual return on plan assets over the past few years, resulted in Lockheed's projecting that the amount of pension expense for 2007 will decrease by approximately 25% as compared to 2006 expense. Lockheed indicated that "In 2006, the minimum pension liability decreased from the balance recorded at December 31, 2005, primarily due to a higher than expected return on benefit plan assets in 2006 and the increase in the discount rate assumption..."

A review of IBM's 2006 10K indicates that they changed their mortality rate assumption thereby increasing 2006 income by approximately $55 million. Changes to the rate of compensation increases reduced IBM's 2006 net periodic pension cost, which therefore increased income by approximately $32 million. Furthermore, IBM stated in their most recent annual report that they assume that the healthcare cost trend rate for 2007 will be 8 percent. In addition, the company assumes that the same trend rate will decrease to 5 percent over the next four years. One wonders what the true healthcare cost trend is and what assumptions have been made or changed by various companies. This is an issue that FASB will take into consideration during Phase 2 of their Pension reform project.

CONCLUSION

Milliman's (2006) study of 100 large U.S. corporations that sponsor defined benefit pension plans indicated that although the aggregate pension deficit decreased by $14.8 billion in 2005, the aggregate pension deficit for these 100 companies was still $96 billion. If interest rates continue to rise, it will enhance funding to the extent that actual returns on pension assets will exceed expected returns. Thus, inflation can save investors as it has during 2005 and 2006. However, offsetting this is the fact that many pensions have cost of living increases. Furthermore, healthcare costs are significant and have been increasing at a rate of approximately 10% a year. Further complicating this issue is the fact that approximately 75 million baby boomers will become eligible for benefits in the very near future and retirees are also living longer.

Thus, FASB has taken an important step with this new standard to help average financial statement users understand the magnitude of a company's retirement obligations by recording them on the balance sheet. It is interesting to note that although pension liabilities get the most publicity and employers have anticipated their pension liabilities with some prefunding, it is actually the almost entirely unfunded retiree healthcare costs that will be the big surprise. Healthcare costs are difficult to predict and unlike pension obligations cannot be easily hedged. Actuaries have estimated that it costs about 20% of wages.

Healthcare premiums and expenses have experienced double digit increases in recent years. OPEB has even been described by some as a financial tsunami.

The more human aspect of the impact of this new standard could be to hasten the demise of the defined benefit plan as we know it and the curtailment of postemployment benefits for new employees. Another unintended consequence may be a renewed interest in the establishment of a national healthcare system which could take corporate America off the hook for retiree healthcare coverage thereby eliminating or reducing their OPEB liability.

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Statement of Financial Accounting Standards No. 87, *Employers' Accounting for Pension Plans.*

Statement of Financial Accounting Standards No.106, *Employers' Accounting for Postretirement Benefits Other than Pensions.*

Statement of Financial Accounting Standards (SFAS) No. 158*, Employers' Accounting for Defined Benefit Pension and Other Postretirement Plans*.

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ARE RETAIL BANKS SATISFYING THEIR CUSTOMERS IN COSTA RICA?

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ABSTRACT

Retail banks serving ethnically diverse customer bases are challenged to measure up to differing perceptions of service quality. While there is existing research about customer satisfaction and service quality in the banking industry around the world, there are no clear conclusions as to the most important service quality dimensions for satisfying bank customers. Moreover, there is little published work about the similarities or differences with which ethnically diverse customers view the service aspect of retail banking. This study examines the perceptions of four specific ethnic groups about how service quality dimensions contribute to their satisfaction with retail banking in Costa Rica. Costa Rica was a logical research location given the large number of expatriates living and working there as well as its own ethnically diverse citizenry. We find that as a group ten service quality dimensions have a moderate positive correlation with customer satisfaction. Each of the four ethnic groups showed significant differences in their perceptions of the importance of each dimension to their satisfaction. In fact, among the four groups, no commonalities existed in how they ranked their three most important dimensions. The findings in this study provide targeted information for bank managers and others working to improve satisfaction levels of specific groups of the ethnically diverse customer population in Costa Rica and elsewhere.

INTRODUCTION

The banking sector experienced rapid growth and competitiveness in light of regulatory changes in large and small markets around the world during the 1980s and 1990s. Correspondingly, the number of global bank mergers during the past ten years has risen. It is now commonplace for banks to traverse state regional and national borders, serving consumer groups with various financial needs, expectations, and perceptions. It is incumbent on banks and their managers to put their best foot forward when deciding on the strategies they will use to generate repeat business, ramp up customer loyalty, and increase profitability, all with an eye on customer satisfaction.

Research shows that some consumers will pay higher fees demanded by large banks because they perceive a higher return on service quality. Others, however, perceive personalization as their key benefit and would rather do business with smaller local banks which charge lower fees (DeYoung, 1999). Since the 1990s, banks have begun to implement new strategies for reducing fixed costs, investing in high-tech infrastructures, instituting innovative products, and introducing service quality programs (Newman, 2001). Retail banks have been recent "victims" of globalization; corporations like Citicorp, American Express, and HSCB Holdings are constantly striving to introduce innovative approaches for promoting trust and sincerity throughout their global customer networks (White, 1998). By taking advantage of emerging trends, industry members can better meet consumer demands when reevaluating and making available more flexible and efficient services.

This paper examines customer satisfaction with banking services provided by Costa Rican banks. Given its political neutrality, high literacy rate and relatively well-developed infrastructure, throughout the

second half of the twentieth century, Costa Rica was an attractive vacation and business destination for visitors from throughout the western hemisphere. Since the end of the region's political instability in the 1990s, however, Costa Rica's attractiveness has increased dramatically, and it has grown into a popular destination for foreigners to live and work.

As result of its attraction to global travelers, ethnic diversity continues to characterize Costa Rica's population, and the country's service businesses, have to appeal to a wide variety of customer likes and dislikes. Pleasing a wide range of customers' preferences is especially important for service businesses in competitive industries (such as retail banking) because many customers perceive their products (such as checking and saving accounts) to be similar among banks. Retail bank managers recognize that their employees must deliver these products with high quality service. The challenge for bank managers in ethnically diverse markets like Costa Rica is to determine which aspects of service are most likely to contribute to their customers' satisfaction.

No published research analyzes the determinants of customer satisfaction in the Costa Rican retail bank marketplace. Nevertheless, Costa Rica banks provide a unique opportunity to examine customer satisfaction for several reasons. The Costa Rican banking system consists primarily of large, government sponsored, institutions with many branch offices throughout the country. In particular, Banco Nacional and Banco de Costa Rica have numerous branches throughout the country. Banco Crédito Agrícola de Cartago is considerably smaller with only a few branches. A fourth bank, Banco Popular, is considered a private bank of public interest. As such, certain special regulations apply to this bank. In 1995, banking laws were changed to allow for private banking. While some private banks have entered the market, the government sponsored banks continue to dominate the Costa Rica banking system. In addition to banks, there are some non-bank financial institutions that accept deposits. Again, these are primarily smaller operations.

The Costa Rican government does not offer banks deposit insurance. However, the government banks are backed by the Costa Rican government. Failures have been relatively rare in the Costa Rica banking system in recent years. However, in 1995, Banco Anglo Costarricense failed with losses of about $200 million. The Costa Rican government stepped in to cover the losses so depositors did not lose any money.

From a customer standpoint, Costa Rica's banks provide most services of a modern day banking system, although they are characterized by slow teller service. While this has been improving, a 30 minute wait to get to a teller is not uncommon, particularly on heavy service times like Fridays and paydays. Armed guards are visible at every bank branch, and frequently customers must pass through metal detectors prior to entering bank buildings. Automatic teller machines are quite popular in Costa Rica. In addition, each of the banks offer internet banking services, through which customers can pay bills and make bank transfers between accounts.

The elements noted above make Costa Rica a unique place to examine satisfaction with banking services. The remainder of this paper is organized as follows: In the next section we discuss the relevant literature regarding customer satisfaction in the banking industry. The following section discusses the data utilized in the study and some summary statistics. Next the Methodology used in the study is presented followed by a discussion of the results. The paper closes with some concluding comments and a discussion of the limitations of the paper.

REVIEW OF THE LITERATURE

Until the early 1980s, most existing research regarding the link between customer satisfaction and service quality focused on customer satisfaction in the manufacturing sector. This type of research was relatively

easy to identify and measure given the relative ease of product standardization (Crosby, 1979 & Garvin, 1983). Slowly, new studies began to emerge as numerous researchers worked to identify and explain the determinants of customer satisfaction in the service sector. Since most services are intangible and their delivery is performance based, definitive quality measurement systems can be challenging (Zeithaml, 1981). Services are usually diverse and highly labor intensive, resulting in noticeable variations in service delivery rather than the automatic, machine-like delivery of a tangible factory product.

Research prior to the mid-1980s concentrated mainly on the operational characteristics of customer satisfaction and assessment of the motivators that caused customers to be satisfied with the services they received (Oliver, 1980; Churchill & Suprenant, 1982; Lehtinen & Lehtinen, 1982; & Bearden & Teel, 1983). Oliver, (1980) brought forth the theory that a direct relationship between a customer's satisfaction and his expectations does indeed exist. "Satisfaction" was later found to be determined by the customer's positive perception of the performance of a particular service. In other words, the higher the perception of the quality of customer service, the higher the level of customer satisfaction (Bryant et al., 1998; Vavra, 1997; Ganesh, Arnold, & Reynolds, 2000; and Caruana, Money and Berthon, 2000). More current research in this area found that businesses can often acquire repeat customers by providing service that surpasse their expectations (Oliver, 1997; Olson & Dover, 1979; Yi, 1991; Bryant et al., 1998; and Ganesh et al., 2000).

While working on their well-known study of customer satisfaction in the service sector, Parasuraman, Berry, and Zeithaml (1985) identified ten determinants of service quality that contribute to customer satisfaction. To conduct research in four distinct service industries, they classified the ten determinants and created SERVQUAL, their scale for prioritizing, comparing, and evaluating various performance attributes of service delivery. The authors indicated that the reliability, responsiveness, competence, access, courtesy, communication, credibility, security, understanding, and tangibles dimensions are ten criteria used by customers to evaluate quality of the service they receive. In later studies, the authors established that customer perceptions of service quality and ensuing levels of satisfaction are related to individual levels of tolerance. They concluded that a customer is likely to be satisfied with both the service and the service provider, if a service is provided within acceptable quality limits. Later, the researchers condensed their original ten dimensions into five, with the assertion that, within a wide array of service industries, customers were unable to distinguish clearly among all ten original dimensions (Parasuraman, 1988).

Today, researchers tend to view customer satisfaction and service quality on the basis of research completed during the last 30 years. For instance, Rust and Zahorik (1993) and Trubik and Smith (2000) concluded that high levels of customer satisfaction result in customer retention, specifically in highly aggressive, competitive, and saturated markets. In 1996, Zeithaml et al. illustrated that superior levels of service quality stimulated favorable customer intentions, which subsequently encouraged retention, decreased expenses, increased profits, and customer referrals. Customers demonstrate positive intentions and satisfaction for a business by purchasing more, paying premium prices, and referring the business to others. This link between customer intentions and service quality has been reinforced through supplementary research by Parasuraman, et al. (1988); Anderson and Sullivan (1990); Parasuraman, Berry, and Zeithaml (1991); and Cronin and Taylor (1992).

Rust and Zahorik (1993) and Trubik and Smith (2000) advocate that high levels of customer satisfaction produce customer retention, especially in certain highly-competitive and saturated markets like financial services. Financial service institutions whose immediate competitors offer comparable products have learned that a critical element to their success is the provision of enhancements to service quality (Allred and Addams, 2000). Today's banking environment is truly competitive, with the same or similar products easily accessible from the majority of institutions. Effectively, service quality is the foremost

manner of differentiating oneself in the marketplace (Seonmee and Brian, 1996; Barnes and Howlett, 1998; Naser, Jamal, and Al-Khatib, 1999; and Wang, Lo and Hui, 2003). Retail banks are seen as the primary purveyors in the marketplace of products that are perceived as similar. As a result, retail banks must offer services that meet or exceed their customers' expectations in order to continue thriving and remain profitable entities.

Since Parasuraman et al. (1985) classified their original ten dimensions and released their conclusions regarding service quality; researchers have continued to examine various components of the financial services industry in their quest to more easily identify which of the ten will most likely lead to positive customer satisfaction. Most research shows solid correlation between the group of dimensions and customer satisfaction, however, a common grouping of the ten service quality dimensions that points to a universal perception as most important to customers' satisfaction is not prominent.

In 1996, Snow et al. (1996) found pointedly differing service quality expectations between different ethnic groups in Canada. Lassar, Manolis and Winsor (2000) discovered that private banks in South Florida were providing consistently high levels of dependable service to their Latin American customers. As a group their customers felt that reliability was the most important service quality dimension for their satisfaction Othman and Owen (2001) established compliance, assurance, and responsiveness as the dimensions most strongly associated with the average customer's satisfaction in the Kuwaiti banking sector.

Yavas, Benkenstein and Stuhldreier's (2003) research of private retail banks in the former East Germany explained were tangibles (the physical appearance of facilities and personnel), responsiveness (timeliness of service), and empathy. Bick, Brown and Abratt (2004) concluded that in South Africa, customers perceived the most important service quality dimension to be reliability. Research of retail bank customers' satisfaction in Thailand revealed a significant negative correlation with empathy, one of Parasuraman et al.'s ten service quality dimensions (Promsi, 2005). Competence, safety, and tangibles were the dimensions that most contributed to customers' satisfaction with their banks in Dhaka City, Bangladesh (Islam and Admed, 2005). African American, Latino, and non-Latino Caucasians in our South Florida study clearly demonstrated differences the significance of the ten dimensions to their satisfaction with their retail banks (Lopez, Hart, and Rampersad, 2007).

DATA, METHODOLOGY AND SUMMARY STATISTICS

Data for this study were obtained by conducting a survey of customer satisfaction with banking services in Costa Rica. The researchers used the same survey instrument for this study developed and used for their research about customer satisfaction in South Florida (Lopez, Hart & Rampersad; 2007). This instrument has its foundation in work done by Parasuraman et al. (1985) in which the SERVQUAL instrument was developed. This instrument has been criticized by numerous researchers of customer satisfaction and service quality in the financial services industry. Carman (1990), Peter et al. (1993) and Sureshchandar, Rajendran and Anantharaman, et al. (2002), among others, have criticized the SERVQUAL instrument, questioning its ability to include all important dimensions of service quality. Carman (1990) found that each of the ten dimensions differed in importance depending on the industry researched and recommended that researchers modify SERVQUAL, creating their own survey instrument to fit the specific needs of the industry in question. Given this and other evaluations of SERVQUAL's value as a universal research tool, we developed our own survey instrument that complements SERVQUAL.

Using input from ten South Florida bank executives, we eliminated many of the questions in SERVQUAL and reworded others. We worked with local retail bank executives to ensure that the survey

instrument would be easily understood by people from different ethnic groups. We pilot tested our survey on a small group of ethnically diverse retail bank customers in South Florida which included five women and five men over the age of 18. The pilot test group included three African-Americans, three Latinos, and four non-Latino Caucasians. Final revisions were made to the survey using pilot test participants' feedback.

The survey instrument used in this study contained four sections. The first section asks questions about the demographic characteristics of the respondent (age, gender, ethnic group, and education levels). Local experts were asked about the most common ethnic groups in Costa Rica. These inquiries were used to develop the ethnicity categories in section one. The second section gathers information about respondents' satisfaction with their retail banks. The third section has 27 statements asking for respondents' perceptions of the importance of ten service quality dimensions for their satisfaction with their retail banks. In the last section, respondents force ranked each of the ten dimensions in order of their importance to their satisfaction with their retail banks.

For the Costa Rican marketplace, the survey was translated into Spanish by several of the researchers. A draft was sent to a Costa Rican advisor who made additional language changes. The survey was then reverse-translated into English by an advisor in Florida before final changes to the Spanish version were made.

Surveys were distributed to respondents outside retail outlets and in businesses in the San Jose, Alajuela, and Heredia provinces in Costa Rica. Data was collected during June and July 2006. There were three different data collection teams who were trained and supervised by one of the researchers. Members of the data collection teams answered participants' questions about survey questions and assured respondents of the anonymity of their responses. To minimize timing and/or location biases in the sample, data was gathered at different locations, on different days of the week, and at different times of the day. To include customers from a variety of retail banks, researchers did not collect data outside or near any bank. Respondents were not asked to identify their retail banks.

The objectives of this research were (1) to determine if Costa Rica's diverse retail banking customers' satisfaction is positively correlated with the ten service quality dimensions (2) to find out if various ethnic groups in Costa Rica report different levels of customer satisfaction with their retail banks, and (3) to determine if diverse ethnic groups in Costa Rica have differing perceptions about the importance of the ten service quality dimensions for their satisfaction with their retail banks.

This study's hypotheses are:

H1: There is a statistically significant positive correlation between Parasuraman et al's ten service quality dimensions and customers' satisfaction with their retail banks in Costa Rica.

H2: Each of the ten dimensions will have a significant explanatory power for customers' satisfaction with their retail banks in Costa Rica.

H3: Different ethnic groups in Costa Rica will report different levels of customer satisfaction with their retail banks.

H4: Different ethnic groups in Costa Rica will have different perceptions of the relative importance of the ten service quality dimensions to their satisfaction with their retail banks.

Methodology

This undertaking leverages work by many researchers, including Parasuraman et al. (1985), Carman (1990), Snow et al. (1996), Promsi (2005), and Lopez, Hart and Rampersad (2007). The theoretical framework rests on Parasuraman et al.'s 1985 theory that ten distinct dimensions of service quality are positively correlated with customer satisfaction in service industries. Although Parasuraman et al. later consolidated the ten dimensions into a smaller group of five, several researchers, including Carman (1990), recommend studying the original ten. Because we found perception differences of the original ten dimensions among South Florida's ethnically diverse population (Lopez, Hart & Rampersad, 2007), we decided to evaluate customers' perceptions of all ten dimensions for our Costa Rica research. Several Florida-based bank executives familiar with the Central American banking industry also recommended including the original ten dimensions in this study.

Summary Statistics

A precise count of the response rate was not recorded. However, the research teams estimated that about 50% of those individuals that were approach elected to participate in the study. The procedures netted 319 completed surveys. When analyzing the data collected, the researchers found that a large percentage of respondents made mistakes in completing the survey's final section, which was intended to collect data to test H4 (as defined below). To ensure that only reliable data was included in our final analysis for H4, 109 surveys were excluded from that analysis. Thus, the sample size for H4 was 210. Table 1 contains demographic information about the sample. The first column reports on the data used for hypotheses 1-4. The second column reports on the data used to test hypothesis 4.

Table 1: Demographic Characteristics of the Sample Testing H1, H2 and H3

Demographic variable	*Valid percent H1-H3*	*Valid percent H4*
Age Ranges		
18-27	39.1	40.73
28-37	29.3	28.2
38-47	16.4	20.1
48-57	10.4	8.6
58+	4.8	2.4
Gender		
Male	57	56
Female	33	34
Ethnicity		
Español (Spanish)	11.9	16.5
Mestizo (mixed race)	20.8	31.3
Indígena (native)	0.3	0.0
Coreano (Korean)	1.6	0.0
Anglo (non-Latin Caucasian)	60.4	46.2
Caribeño (Caribbean)	5.0	6.0
Completed education level		
Less than high school	6.9	5.7
Vocational	8.2	8.1
High school	70.3	72.2
College	11.7	18.1
Graduate school	1.6	2.4
Post graduate	0.3	0.5

This table shows the demographic characteristics of the participants in the study by age, gender, ethnicity and completed educational level.

FINDINGS

The data were analyzed using the SPSS program. The analysis begins by examining the correlation between customer satisfaction and the ten service quality dimensions. Customer satisfaction was measured as the response to the following question: "How Satisfied are you with the services provided by your financial institution." We ran a Pearson's product moment correlation between customer satisfaction and the various explanatory variables to thereby testing the first hypothesis.

> H1: There is a statistically significant positive correlation between Parasuraman et al's ten service quality dimensions and customers' satisfaction with their retail banks in Costa Rica.

The results are presented in Table 2. The results indicate that ten of the explanatory variables are significantly correlated with customer satisfaction, while five variables were not significantly correlated. Interestingly, the demographic variables were not correlated with customer satisfaction, indicating that the views of various demographic groups regarding customer satisfaction are generally consistent. Analysis of the data for this hypothesis was interesting because, while all ten service quality dimensions showed positive correlations with customer satisfaction at the .001 level, none resulted in a strong positive correlation (more than .500). Unlike results from the 2007 Lopez, Hart, and Rampersad study of South Florida's ethnically diverse customer population, reliability was found to be the most important dimension for satisfaction among Costa Rican retail bank customers (with a correlation of .487). This is similar to findings by Lassar, et al., (2000), which revealed reliability as the most important dimension of satisfaction for Miami private bank customers from the US and Latin America.

Table 2: Correlations of Satisfaction with Service Quality Dimensions

Service Quality Dimension	**Dimensions' Correlations with Satisfaction (at the .001 level)**
Reliability	0.487***
Responsiveness	0.420***
Credibility	0.417***
Tangibles	0.380***
Empathy	0.378***
Communication	0.350***
Courtesy	0.345***
Access	0.338***
Safety	0.331***
Competence	0.325***
Age	-0.025
Gender	-0.036
Ethnicity	-0.014
Education	0.016
Marital Status	0.015

*This table shows the Pearson's Product Moment Correlations between the total satisfaction score and each of Parasuraman's ten service quality dimensions in Costa Rican banks. *** indicates significance at the 1 percent level, ** indicates significance at the 5 percent level and * indicates significance at the 10 percent level.*

Next, we test hypothesis 2 which states that each of the ten dimensions will have significant explanatory power for customers' satisfaction with their retail banks in Costa Rica. The test is completed by regressing customer satisfaction on the independent variables. The regression specification is as follows:

Retail bank satisfaction = alpha + B1 (age) +B2 (gender) + B3 (ethnicity) + B4 (education) + B5 (marital status) B6 (tangibles) + B7 (reliability) + B8 (responsiveness) + B9 (competence) + B10 (courtesy) + B11 (credibility) + B12 (safety) + B13 (access) + B14 (communication) + B15 (empathy).

The regression results are presented in Table 3. The results reveal a coefficient of correlation of 0.614, indicating a reasonably strong positive relationship. The R^2 of the regression is 0.378 and the adjusted R^2

is 0.343 indicating a general lack of multicollinearity. The F-statistic for the regression is 10.876, which is significant at the one percent level. Only three of the regression coefficients are significant in explaining total customer satisfaction. These three significant coefficients are tangibles, reliability and empathy, which indicates a general lack of support for hypothesis 2.

Table 3: Regressions on Total Customer Satisfaction

Variable	**Coefficient**	**t-statistic**
Constant	19.247	2.494**
Age	-1.422	-1.455
Gender	-2.405	-1.139
Ethnicity	-0.578	-0.963
Education	1.018	0.971
Marital Status	0.004	0.004
Tangibles	0.211	2.522**
Reliability	0.269	3.821***
Responsiveness	0.014	0.202
Competence	-0.002	-0.029
Courtesy	0.035	0.429
Credibility	0.138	1.574
Safety	-0.020	-0.270
Access	-0.015	-0.238
Communication	0.089	1.583
Empathy	0.164	2.815***
R	**0.614**	
R^2	**0.378**	
R^2 Adjusted	**0.343**	
F	**16.717*** **	

*Table 3 shows the results of the regression of independent variables of interest on total customer satisfaction. *** indicates significance at the 1 percent level, ** indicates significance at the 5 percent level and * indicates significance at the 10 percent level.*

The analysis continues by testing the third hypothesis that different ethnic groups in Costa Rica will report different levels of customer satisfaction with their retail banks. The SPSS means test for differences in means was conducted. We failed to reject the null hypotheses of no difference in means. In addition to those items listed here, the results held for Koreans, Other Asians, and Indians. However, due to the small number of surveys completed by members of these ethnic groups, we do not draw any conclusions for them. Table 4 shows the mean levels and standard deviations.

Table 4: Customer Satisfaction Scores by Ethnicity

Ethnic Group	**N**	**Mean Satisfaction Score**	**Standard Deviation**
Spanish	38	73.55	30.96
Mestizos	66	82.19	12.19
Anglos	193	79.02	19.64
Caribbeans	16	83.12	18.16
Entire Sample	319	79.10	20.04

Table 4 shows the mean customer satisfaction score by ethnicity.

In the final section of the survey, respondents were asked to provide their opinions about the relative importance of each of the ten service quality dimensions to their satisfaction with their retail banks. We expect that each ethnic group will value the service quality elements differently. Thus, we propose the following hypothesis:

> H4: Different ethnic groups in Costa Rica will have different perceptions of the relative importance of the ten service quality dimensions to their satisfaction with their retail banks.

Respondents force ranked the ten dimensions from one to ten, with a one representing the most important dimension to them, and ten indicating the least important. As discussed earlier, due to mistakes in

participants' responses to the final section of the survey instrument, 109 surveys from the initial 319 were discarded before analyzing the data to test H4. Thus, this test was conducted using 210 data observations from participants who responded without errors to the final section of the survey. We ran means and median tests to determine differences in preferences.

Table 5 and Table 6 show the means and results of a means test of Spanish, Mestizo, Anglo, and Caribbean participants' rankings. We did not include Indian, Korean, and Other Asian ethnic groups' information in this analysis because the data was too limited. Dimensions with tied rankings are italicized.

Table 5: Results of Means Test of the Perceived Relative Importance of Service Quality Dimensions

Most to Least Important	Spanish	Mean Score	Mestizo	Mean Score	Anglo	Mean score	Caribbean	Mean score
1*	Safety	4.7143	Reliability	4.8333	Communication	4.5526	Reliability	3.4000
2	Communication	5.2000	Tangibles	4.8485	Empathy	4.5895	Courtesy	4.6000
3	Access	5.3030	Responsiveness	5.2576	Safety	5.0211	Communication	5.2000
4	Tangibles	5.7429	Communication	5.4545	Access	5.3579	*Empathy*	*5.3000*
5	Responsiveness	5.8286	Courtesy	5.5758	Credibility	5.4789	*Tangibles*	*5.3000*
6	Reliability	5.9571	*Competence*	*5.5909*	Competence	5.7474	Competence	5.4000
7	Competence	6.0571	*Credibility*	*5.5909*	Courtesy	5.8053	Credibility	5.5000
8	Credibility	6.1471	*Safety*	*5.5909*	Reliability	5.9000	Responsiveness	5.7000
9	Empathy	6.1714	Empathy	6.2879	Responsiveness	6.6158	Access	5.8000
10	Courtesy	6.3000	Access	6.3939	Tangibles	6.7263	Safety	6.3000

Means Test scores (derived from SPSS Means Test) by ethnicity for each of the ten dimensions of customer satisfaction.

We find that there are significant differences in both the order of relative importance each group gave to the dimensions as well as in their means scores, as evidenced in Table 5 and Table 6. For example, Caribbeans ranked Reliability first with a mean score of 3.4, whereas Anglos ranked Reliability seventh with a mean score of 5.9. The Spanish perceived Courtesy as the least important dimension to their satisfaction (giving it a mean score of 6.3), Anglos ranked it as sixth most important (mean score = 5.8053), and Caribbeans ranked it second (mean score = 4.6). Tangibles were the second most important dimension in Mestizos' satisfaction with their retail banks (mean score = 4.8485), and this dimension was ranked last by Anglos (mean score = 6.7263). The only dimension that shows some similarity in rankings across all four ethnic groups is Communication, which ranked in the top four for all ethnicities.

To quantify the differences in means, an ANOVA test of the data for H4 showed statistically significant differences among the means of the scores of the four ethnic groups for eight of the ten dimensions. For these eight dimensions, the F ratios show significant variability among the groups. Thus, the null hypothesis of no differences in rankings (H4) is rejected. Analysis for the Competence and Credibility dimensions showed no statistically significant variance among the groups. Three post hoc tests (Tukey, LSD, and Scheffe) further confirmed these findings for between group variances. Detailed test results are in Table 6 below.

Table 6: Results of ANOVA Test of the Perceived Relative Importance of Service Quality Dimensions

Dimension	F
Empathy	4.686***
Reliability	4.481***
Tangibles	4.346***
Responsiveness	3.436**
Access	1.761
Safety	1.313
Courtesy	1.253
Communication	1.246
Credibility	.571
Competence	.413

*Table 6 shows ANOVA test results for the variance of the means and associated level of significance among the four ethnic groups for Parasuraman's ten service quality dimensions at the .01 level. *** indicates significance at the 1 percent level, ** indicates significance at the 5 percent level and * indicates significance at the 10 percent level.*

CONCLUSIONS AND LIMITATIONS

We decided to undertake this research project after completing a similar analysis of the South Florida retail banking sector because we were interested in seeing if analysis of Costa Rica's ethnically diverse population would reveal similar findings. Costa Rican study results were surprisingly different from our South Florida findings in that the correlation of all ten dimensions with satisfaction was much weaker. Additionally, respondents' rankings of the individual dimensions showed greater differences among ethnicities than was revealed in South Florida.

Our research confirmed that the group of ten dimensions of service quality that Parasuraman et al. identified in 1985 is moderately important to Costa Rican customers' satisfaction with their retail banks. Second, while all of the ten dimensions showed positive correlations with satisfaction at the .001 level, they were not statistically significant. This provides conflicting information for the country's bank executives in that there is no clear direction about a service quality dimension upon which bank leaders can focus their training that would ensure customer satisfaction.

Third, although analysis found no significant differences among satisfaction levels of the region's different ethnic groups, they did demonstrate that Spanish, Mestizo, Anglo, and Caribbean ethnic groups in Costa Rica have sharply different perceptions of the relative importance of nearly all of the ten service quality dimensions. The marked differences among ethnic groups can be of great importance to retail bank branch managers operating in neighborhoods in which particular ethnicities predominate. By focusing service training on those quality dimensions that are most important to the ethnicity served, managers and customer service representatives may be able to increase their customers' satisfaction levels.

This study's results contribute significantly to the collective body of knowledge about ethnicity, customer satisfaction, and service quality determinants for retail banks. They confirm that major ethnic groups in Costa Rica have divergent views about the importance of service quality dimensions to their satisfaction, even though their overall levels of satisfaction are similar. Research conclusions provide industry executives and academics with greater knowledge of the service areas customers of different ethnicities perceive as important. If used appropriately, this information may help banks achieve higher levels of customer satisfaction, retention, and profitability.

One of this study's most important conclusions is that ethnic groups rank the importance of each service quality dimension differently. For managers of branch banks in neighborhoods serving areas dominated by a specific ethnic group, this knowledge can help them focus their customer service efforts. For example, bank managers serving the Anglo population in Costa Rica now know that their service

strategies should emphasize communication, empathy, and the safety of customers' deposits. Branch managers serving the Caribbean population in Costa Rica have learned that their service strategies must emphasize reliability, courtesy, and communication to satisfy their customers. Mangers of branches serving Mestizos must emphasize their banks' reliability and responsiveness, and their facilities should rate high in tangibles. Finally, branch managers now know that their Spanish customers value safety, communication, and access more than the other service quality dimensions. By concentrating on the service quality dimensions perceived as most important to the ethnic groups served by their retail banks, bank mangers can incorporate appropriate investments into their plans for facility improvements, staffing and incentive programs.

Some limitations should be addressed in future research. First, while a large sample contributed to healthy findings for Spanish, Mestizo, Anglo and Caribbeans bank customers in Costa Rica, not enough respondents from the Korean, Indian, and Other Asian ethnic groups participated for us to be able analyze and drawn conclusions about their satisfaction levels or perceptions. If this study is to be repeated in Costa Rica, researchers should collect sufficient data from these important ethnic groups. Another limitation is that data was collected from only three Costa Rican provinces, which may have biased the study's results, particularly if respondents are not representative of Costa Rica's general population. For example, the large percentage of respondents classifying themselves as Anglo does not mirror the country's overall population. A final limitation is reflected in many respondents' obvious misunderstanding of instructions for the final section of the survey. Since a disproportionate number of mistakes were made by Anglos, perhaps an English-language survey should have been provided as an alternative to having non-native English speakers complete Spanish-language surveys.

Recommendations for future research include 1) Repeat this study in Costa Rica, ensuring collection of data from the ethnic groups representing the overall population and clear understanding of survey instructions, 2) Replicate this study in other Central American countries with different banking systems. This could provide new learning about customer satisfaction and service quality as well as aid in the generalization of research results to the region, 3) Conduct a follow-up study in Costa Rica to gain a better understanding of why different ethnic groups perceive the ten service quality dimensions so differently. This could help retail banks enhance customer loyalty and 4) Identify one retail bank in Costa Rica or elsewhere and conduct focused research about its customers' perceptions of the ten dimensions of customer satisfaction. Compare the results by branch or division of that bank that offers different products and services. This could pinpoint details regarding the most important dimensions for buyers of different categories of financial products or services.

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IS IT WORTH THE COST? MARKETING TO NEGATIVELY PERCEIVED CONSUMER GROUPS

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ABSTRACT

Examining consumer concerns is of importance to marketers. Some concerns include the desire for businesses to be more socially responsible through products and being more inclusive in advertisements. . To stress the need for social responsibility, consumers have reverted to using civil disobedience. A civil disobedience tool, the boycott, is now being used to protest not only unethical behaviors, but to also discourage businesses from marketing to certain populations and from giving employees of that group recognition. Consumer groups that are prejudiced against other consumers are attempting to impact corporate decision making in regards to human resource policies and marketing decisions. This paper looks at the history of inclusiveness, boycotts, and the current state of affairs with consumer groups.

INTRODUCTION

Prejudice, disliking a person based on a group that they belong to, has been a part of the human condition for centuries. These attitudes have impacted societies across the world for centuries. The Inquisition, slavery, Apartheid, the Holocaust and ethnic cleansing are some of the more brutal forms that prejudice can take. Prejudice is evident in people in varying degrees. Not everyone dislikes, or hates, people of certain groups to the point of wanting to kill them, they are more subtle in their prejudice – discrimination in hiring, housing, property ownership, rights. Some people are prejudiced against people who wear fur; others have issues with different skin colors. The effects of prejudice on individuals and groups are well documented in psychological literature. But why should businesses be concerned about prejudice? Because consumer groups that don't like the policies and practices of a company or another consumer group have a tendency to protest or boycott, causing negative publicity and possibly impacting sales.

Consumer groups have a history, since the 1960s, of combining voices and money to protest against business policy, practices and products. There have been successful campaigns against unethical treatment of animals, the antifur campaign, the movement to stop dolphin killing by tuna fishermen, to name a few (McCune, 1990). One of the ways consumers express their displeasure is through a protest or boycott. A boycott is a huge weapon to persuade a business to be socially responsible. The consumer boycott, when organized well, hits the corporation in their most vulnerable area – the balance sheet (Power, 2005). Nike felt the wrath of consumers due to some of their employment practices in other countries. South African businesses felt the impact of an investment boycott. In the late 1990s, supermarkets in Britain pulled genetically modified foods off the shelves after protests and boycotts (Power, 2005).

This civil disobedience tool, the boycott, is now being used to protest not only unethical behaviors, but to also discourage businesses from marketing to certain populations and from giving employees of that group recognition. Consumer groups that are prejudiced against other consumers are attempting to impact corporate decision making in regards to human resource policies and marketing decisions.

Is it worth the potential costs to businesses to continue to market to all consumers? Should corporations listen to well-organized and well-funded consumer groups, and limit their marketing to "appropriate groups"? With more organized, funded and Internet savvy consumer groups in the mix, are boycotts a realistic threat to business success?

This paper will examine these questions, starting with a look at research on prejudice and consumer attitude to other consumers and the product based on race, on ethnicity, and then on sexual orientation. Finally, this paper will discuss a few organizations that are currently utilizing boycotts and protests to sway corporations from marketing to other consumer groups via the Internet.

LITERATURE REVIEW

Consumer versus consumer prejudice is not new. Marketing researchers and advertising professionals have been examining this topic since the 1960s when they began looking at white and black consumers and ways to effectively target them. Marketing and advertisement professionals focus their efforts on consumers' wants and needs. They keep tabs on what consumers are thinking. In the early 1960s, researchers were examining the impact of including blacks in advertisement and marketing materials for products aimed at whites. One study looked at attitudinal responses between integrated and non-integrated promotional stimuli (Barban & Cundiff, 1964). Barban and & Cundiff's (1964) results demonstrated that white's response to ads with black models was either neutral of slightly positive. Prior to this time, marketing was very segregated – products marketed to the black community used black models in black media (billboards in black neighborhoods, black magazines, black newspapers). White models were used for all commercials on television and in the advertisements in mainstream magazines and newspapers.

Other researchers used the methodology from the Barban & Cundiff study to examine the effects of different levels of social intimacy using integrated models (Barban, 1969), the level of the subject's prejudice (Cagley & Cardozo, 1970), the effect of the advertisement on the product advertised (Muse, 1971, Stafford, Birdwell & Van Tassell, 1970), and the impact on consumer brand loyalty when using integrated promotional materials (Block, 1972). These studies focused primarily on print media advertisement.

Cagley and Cardozo (1970) raise serious doubts about the use of black models in promotional materials. They identify the possibility of a "white backlash" possibly adversely affecting advertisers should reactions to blacks in ads be related to racial prejudice. Of primary importance in this study is the need for examination of levels of prejudice in a market area. The authors concluded that advertisers could unknowingly precipitate a "white backlash" by running ads with black models in more prejudiced markets and an offsetting reaction from liberal whites is unlikely (Cagley & Cardozo, 1970).

Businesses were concerned about the potential monetary loss if they offended their majority white customers – a backlash. Bush, Gwinner, and Solomon (1974) conducted some of the first research on white consumers sales response to the using of blacks in in-store promotional materials. They found that white consumers purchased equally from all experimental displays including all white models, all black models and an integrated (black and white models). This study, taking into consideration the limitations due to sample size (conducted in 3 supermarkets in predominately white markets), does provide evidence that the use of minority images in promotional materials does not adversely affect short-term sales in predominately white markets. This study has further significance when combined with the prior mentioned research as it suggests that the use of separate promotional campaigns for white and black markets may be unwarranted and the use of integrated campaigns are perceived in a positive manner by minority populations (Bush, Gwinner, & Solomon, 1974).

Civil rights organizations in the 1960s pushed for businessmen to use more minorities in promotional materials. The prevailing attitude was that increased visualization of integrated situations would help decrease racial stereotyping (Cox, 1970). These groups utilized the threat of boycotts and achieved limited immediate success but continued the push for more integrated advertising (Barban & Cundiff,

1964). Larger corporations did begin to integrate advertisements but smaller businesses were concerned about adverse sales consequences (Hair, Solomon & Bush, 1977).

Hair, Solomon and Bush (1977) conducted a factor analysis study of black models used in television commercials. They identified seventeen variables and grouped them into four categories. This study examined commercials shown in different geographic areas and noted that marketers used different advertisement strategies based on geographical strategies. Therefore, depending on the population mix of geographic area marketers will alter their promotional material to lessen the adverse impacts (Hair, Solomon & Bush, 1977).

As minority groups became more influential, business started courting them with a continuing eye on their majority clients. Marketers had a wish to design strategies that would appeal to the growing black market without alienating the dominant white market – again attempting to avoid the backlash discussed by Cagley and Cardozo (1970). "As minority groups become more influential, the threat of boycotts and lawsuits forced marketers to use more black models in promotional materials" (Bush, Hair & Solomon, 1979, p. 341). While there was still a concern about potential backlash from the predominant consumer group, the size of the minority group was bringing into question which group would have the largest negative impact on the business.

Significant research on race and prejudice as it related to business and marketing started by examining the concerns of black and white consumers and then, over time, that research took into account other ethnic groups as firms attempted to capture a larger share of the minority market (Qualls & Moore, 1990). Increased representation of ethnic groups in promotional materials has increased, again with the hope that one result of this action being an erosion of perceptual barriers between minority groups and the remainder of society (Qualls & Moore, 1990). Similarly to the early studies about black and white consumers, businesses again were concerned that using ethnic images in promotional materials would negatively impact the evaluation of the advertised product by the majority consumer. Qualls and Moore (1990) examine in-group bias theory and polarized appraisal theory to determine if one of these theories helps to explain the effect of race on consumer's evaluation of advertising. This research demonstrated that in-group bias was prevalent in advertising evaluation. An important contribution of this research is that it "provides a theoretical explanation of the impact of racial stereotyping in advertising"[in-group bias] which should give marketers a better understanding of the potential effectiveness of advertising campaigns that target minority and majority consumers (p. 150).

Forehand and Deshpande (2001) proposed that consumers' awareness of their membership in social groups (and potentially felt distinctiveness based on membership) may be brought forth by execution factors in a targeted advertisement as well as contextual primes that precede exposure to the targeted advertisement. They discussed ethnic self awareness which is defined as a temporary state during which a person is more sensitive to his or her ethnicity and this temporary state can be primed by cues in advertising and consumption situations. The authors hypothesized that ethnic primes in an advertisement would elicit ethnic self awareness and prompt more favorable attitudes toward same ethnicity actors featured in ethnically targeted advertisements (in-group bias).

Culture and gender differences are displayed in modern media outlets. The television entertainment industry has been accused of being a producer and promoter of stereotypes and prejudicial attitudes (Coltrane & Messineo, 2000). The authors noted that television producers have segmented audiences so that advertising could be created to reach each separate group. Television helped create lifestyle segmentation based on income and ethnicity. "Although segmented markets can engender a tight sense of community among people who share similar backgrounds, such differentiation can also promote suspicion of others" (p. 367). The authors noted that while television was attempting to be "inclusive during the 1990s, commercials reproduced many stereotypes of race and gender" (p. 385). Turow (1997)

blames segmentation strategies for increasing racial tensions during the latter twentieth century. Wilson & Gutierrez (1995) suggest that television once acted to bring people together, it now appears to reinforce the differences that keep them apart.

Bhat, Leigh and Wardlow (1998) took the idea of in-group bias a step further. They examined how one group (heterosexuals) reacted to the portrayal of an out-group (homosexuals) in promotional materials. They found that the emotional and attitudinal responses of heterosexuals to homosexual advertisements depended upon the heterosexual's general attitude toward homosexuals. The authors also attempted to discover if there was an impact on the attitude of the heterosexual toward the brand that utilized homosexually themed advertisement and found mixed results, which they attributed to using well-established brands (Bhat, Leigh & Wardlow, 1998). So while there is still some concern about the level of negative response regarding an out-group representation within the promotional material, the researchers recognized the benefits from a universal campaign and noted that having an inclusive advertising campaign might shift the consumer's focus to the common situations all people have versus the fact that an out-group is represented in the commercial.

Another study looking at in-group bias was conducted by Wilkinson & Roys (2005). This study looked at different components of sexual orientation to determine the effect those components had on heterosexuals' impressions of gays and lesbians. Also included in this study was whether or not participation gender and religiosity affected this impact. As previously noted in other studies, in-group bias was a factor in the results of the study. The authors found that by placing "differential emphasis on the components of sexual orientation in representations of gay men and lesbians can affect heterosexuals' impressions of such individuals" (p. 80).

Until this point, the literature reviewed has focused on prejudice, in-group bias and the impact that has on consumers of varying group membership. The next area to consider is social responsibility. Social responsibility in business can take many forms, a few include the following: (1) towards the environment by sponsoring recycling or clean up programs, (2) towards the community by being a good corporate neighbor, (3) towards vendors by treating them fairly, paying in a timely manner, (4) towards employees by providing a safe work environment, with fair wages and benefits, and (5) towards consumers by offering a quality product at a fair price, honoring warranties, etc. Social responsibility has become a more salient means of product differentiation, and an effective instrument for developing brand equity (Macchiette & Roy, 1994). Addressing the subject of corporate social responsibility has become recognized as being vitally important to marketers (Gatten, 1991).

There has been an across- the-board erosion of brand loyalty due to the increase in available brands and a competitive marketplace. "In 1975, the average supermarket carried 9,000 items; by 1992, that number was 30,000, with more than 3,000 brands introduced each year" (Macchiette & Roy, 1994, p. 56). This increase in product availability has made it difficult to differentiate products "without using sales promotions emphasizing coupons and price reductions" (p. 56). One way to differentiate your product is through cause related marketing. Many consumers searching for self-actualization embraced the "green consumer movement" discriminated between brands of similar quality based on environmental and social concerns. (Macchiette & Roy, 1994). Environmentally friendly consumers are not the only group that marketers need to be aware of. Social responsibility in marketing includes cause related marketing and providing inclusive advertisements (as discussed earlier).

There is evidence that marketers take chances by ignoring the potential reactions caused by various interpretations of their marketing actions by concerned publics. Boycotts increased dramatically since the 1980's, but also, there are other means of collective action to deter and publicly damage incorrect or socially irresponsible marketers (Macchiette & Roy, 1994). One concern is that of a "damned brand". "This is a brand that, owing to a lack of foreseeing social response from a sensitive

group, has received such negative publicity that the product is dropped for the sake of preserving brand equity and corporate image" (p. 60). Such reactions can occur from social issues relating to questionable products and questionable marketing techniques, which are interpreted as exploitive of a particular group. Some brands that have faced this damning include Uptown and Dakota cigarettes and Power Master malt (Business and Society Review, 1992).

Another concern is the boycott. Consumers have used boycotts to protest cosmetic companies engaged in animal testing, tuna companies and their fishing practices, as well as governments for their oppressive practices (Macchiette & Roy, 1994; Power, 2005). Boycotts are expected to reach unparalleled heights from the early 1990s through the first decade of the new century (Putnam, 1993). This escalation in boycotts is tied to the increased propensity of groups to respond to notions of political correctness, environmental and ethical issues as they relate to marketing techniques.

One of the most famous consumer boycotts based on social responsibility is against the Nestle Corporation. The first boycott was in the mid 1970s and was suspended in 1984 after Nestle agreed to implement the International Code in developing countries (History, n.d.). The boycott resumed in 1988 with several countries from around the world, UNICEF, World Health Assembly, and IBFAN repeatedly calling on Nestle to stop unethical marketing practices of baby formula resulting in starving children in developing countries (History, n.d.). While there are over 31,000 websites with information on the Nestle boycott, the boycott continues (www.google.com). The interest in the topic is cyclical and various agencies involved are struggling for support (www.breastmilkaction.com).

Another example of a social responsibility reason for a boycott is the website www.Karmabanque.com call for a boycott against Coca-Cola. They lay out an agenda on what the expected results are (drop in stock price by 50%) over the next twelve months (Coca-Cola, 2004). Why are they pressing for a boycott of Coca-Cola? Environmental concerns – water supply conflicts with farmers in India, employment issues in Latin America, pursuing marketing plans to brand baby bottles with the Coke logo, to stop discrimination (2000 lawsuit by black workers in Atlanta factories), and to increase education and treatment of AIDS for workers and families in Africa (p. 14).

Proctor & Gamble (P&G), a large multinational corporation, has been the target of a boycott for 12 years by the American Family Association. The American Family Association (AFA) is a large Christian organization whose website boasts over 2.2 million members and growing (www.afa.net). AFA has been boycotting P&G's household products, not because they are a socially irresponsible corporation harming infants, the elderly or the environment. They are boycotting P&G because they are demanding that P&G stop advertising on gay-themed TV shows and web sites and end domestic partnership benefits for employees (Han, 2005; www.afa.net). AFA is claiming victory in this boycott as they state "P&G has stopped their sponsorship of TV programs promoting the homosexual lifestyle and advertising on homosexual Internet sites" (Han, 2005, p. 66).

Proctor & Gamble was not the only corporation targeted by AFA. The Walt Disney Company has faced a nine-year boycott from the AFA and the Southern Baptist Convention. Again, the AFA was not protesting a corporation that was harming the environment or vulnerable populations with their Disney boycott. The AFA was protesting the content of films distributed by MIRAMAX, a Disney subsidiary, and the "promotion of the homosexual agenda throughout the Disney corporation" (www.afa.net). The AFA has also targeted Ford Motor Corporation and Kraft Foods for similar concerns regarding employee benefits, and sponsorship of gay pride events, advertising through homosexual media, and on homosexual websites (Cohn, 2005; Han, 2005).

DISCUSSION

The United States has the largest number of Internet users in the world. Access and use of the Internet is increasing worldwide. Consumer groups are recognizing the power of websites, email lists, targeted email campaigns, and responding to social injustices en masse. Various action groups have websites, from religious affiliations, to animal rights (PETA, www.peta.org), to environmental concerns (www.greenpeace.org), to white supremacist sites (www.stormfront.org) to gay rights (www.hrc.org) and everything in between. These action groups are consumers and they have taken to the World Wide Web to spread their message of corporate and political social responsibility and activism. Previous consumer boycotts revolved around consumers versus corporations due to unfair labor practices, safety issues, or animal rights. There is little information in the literature about studies on boycotts due to companies courting negatively perceived consumer groups.

When consumer groups dislike other consumer groups and protests or boycotts ensue, it is reminiscent of the concerns marketers and businesses had in the 1960s regarding white backlash. Have these tactics been effective? There are times when boycott effectiveness is undeniable – the tuna fishing industry for one example, PepsiCo's pull out from doing business in Burma for another (Sen, et al, 2001). But are boycotts effective? Should businesses be concerned? Pruitt and Friedman (1986) found that consumer boycott announcements were followed by statistically significant decreases in stock prices for the target firms. Additionally, their study found that the overall market value of the target firms dropped by an average of more than $120 million over the two-month post announcement period. Similar results can be found more recently by reviewing the stock prices for Ford Motor Company (sales dropped 19% January 2007 compared to same time 1 year prior) and AFA reports that Ford sales have declined 8 of the 10 months they have been boycotting (Wildmon, 2007). Is that propaganda and the decline in Ford sales due more to product recalls? If so, it is effective propaganda that continues to fuel participation in the boycott.

Other times, boycott effectiveness is questionable – the AFA versus P&G as P&G states they have not pulled advertisement from gay friendly shows or websites, that, in fact, the show did not meet P&G content guidelines or there was no advertising available to purchase (Han, 2005). The Southern Baptist Convention boycotted Walt Disney Co. for several years, yet theme park attendance maintained or increased during this time, as did stock prices (Reed & Friedman, 2005).

Corporations caving in to organizations like AFA might be costly in terms of brand loyalty. When Microsoft gave in to demands from conservatives that it drop its endorsement of a gay anti-discrimination bill in the Washington state legislature, gay rights supporters protested and the company renewed its endorsement after all (Cohn, 2005). Courting the GLBT population requires ongoing visibility in the community, either through media outlets, local organization support, or national organization sponsorship. Switching sides, as Microsoft appeared to do, greatly impacts brand loyalty, for which the GLBT population is known for (DeLozier & Rodrigue 1996, Bowes, 1996).

This same reverse boycott (from the gay population) might work with the Ford issue as well. Volvo, which is owned by Ford, is a long time supporter of gays through advertising on gay themed websites, in gay print media, and having inclusive commercials (www.commercialcloset.org). The AFA first suspended the Ford boycott after meeting with Ford dealership owners. The owners requested an extension to talk to the Ford Motor Company management about the AFA's concerns. However, due to ongoing Ford support of GLBT issues, the boycott went into effect during the summer of 2006. The AFA has a separate website specifically addressing the Ford boycott (www.boycottford.com). Due to the continual support of the gay community by Volvo, Ford might be looking for ongoing support from this community to offset the negative publicity from the AFA. Several gay websites are following and attempting to counter the AFAs boycotts (www.gay365.com, www.hrc.org, www.gay.com).

CONCLUSION

Marketing and advertising strategies have focused on being sensitive to consumer issues. This ongoing concern has been documented in the research since the early 1960s with regard to race relations and the impact on sales. Throughout the past 45 years, a heightened concern about, and public awareness of, social issues has provided strong initiatives for the development of corporate social responsibility as a market driven phenomenon (Macchiette & Roy, 1994). Employees do not want to work for companies without a conscience, and consumers do not want to buy from companies that destroy the environment. A discriminating concern and awareness of social issues has provided incentives for corporate social responsibility to be fully included into an agenda within the marketing system and aggressively implemented within marketing plans (Hutton, 1992).

Businesses have been attempting to differentiate themselves through increased cause related marketing – environmentally friendly, organic, support breast cancer research, to name a few. However, consumer groups have also engaged in cause related marketing that results in more effective protest and boycott campaigns. Therefore, marketers must be aware that a given promotional campaign may elicit a variety of meanings and cognitive, emotional, and attitudinal responses arising from individual and group-related differences, yet an advertisement designed for a very narrow group may not be cost effective (www.commercialcloset.org; Hutton, 1992). Some advertising and marketing professionals are referring to "America as a New Age Fundamentalist State whereby their advertising execution must walk a fine line between radical right religious groups and politically correct police representing sensitive groups" (Marcchiette & Roy, 1994, pp. 60-61).

The desire to not offend various audiences is just one of many facing a business. They must also attempt to be socially responsible, which includes policies that reflect social responsibility towards their employees and consumers. They may use inclusive strategies (which include not only gays and lesbians, but also various ethnic backgrounds) for many reasons: (1) to be on the cutting edge, (2) to be perceived as socially responsible enough, and (3) to penetrate new markets. Advertisers and marketers seeking to employ an inclusive campaign are advised to avoid stereotypic imagery in favor of an emphasis on common human concerns, needs and benefits (www.commercialcloset.org). Businesses that want to demonstrate respect towards employees by offering domestic partnership benefits (which benefit heterosexual unmarried couples and homosexual couples) or if they opt to target the gay community through an inclusive promotional campaign, are now at risk for backlash from prejudicial consumer groups.

Is targeting negatively perceived consumer groups worth the risk of a backlash from the majority consumer group? "For every dollar spent on gay-friendly advertising in 2003 and 2004, GPTMC generated $153 in direct visitor spending. The compares favorably to our general advertising which, in 2001 when it was last analyzed, generated $92 in visitor spending for every dollar spent in advertising" (Todd Evans, Rivendale Media, personal communication August 5, 2005). Fortune 500 companies are beginning to look at same-sex couples as an emerging market and targeting them accordingly. IBM, Volvo, JP Morgan, Subaru, and Budweiser have all featured gay couples in advertisements (Donaldson-Evans, 2004). These companies are weighing the opportunity costs associated with targeting negatively perceived consumer groups. Strategic concerns include: is a boycott planned, how large a consumer group is involved in the boycott, what is the potential financial impact of the announced boycott, is the targeted consumer group large enough to offset the costs incurred from the negative publicity.

In some cases, such as tourism, it has been shown that boycotts lead to increased support from the targeted population (Evans, 2005). Several mainstream businesses, including Anheuser-Busch , Bank of America, Avis-Rent-a-Car and Aetna Insurance, that might have once thought twice about flying their

logos alongside the rainbow flag are actively courting a market they consider beneficial, if not essential, to their bottom lines (Wong, 2005).

FUTURE DIRECTIONS

While backlash from conservative consumers due to increased deliberate targeting of the GLBT population is of importance to businesses, social responsibility requires inclusiveness in marketing and employment. Corporations have a fine line to walk in an attempt to avoid offending various consumer groups. Businesses have recognized the importance of inclusiveness in the past 45 years and research has demonstrated that inclusive advertisements tend to dissipate extreme negative attitudes towards out-group consumers if the promotional campaign focuses on common, or shared, concerns. This review has demonstrated that further research into the prejudicial attitudes and use of civil disobedience by consumer groups is needed. No longer are consumers protesting just environmental or health hazards. They are now targeting multinational corporations based on religious beliefs and values.

The prevalence of websites lends one to look forward to future research representing case studies of boycott attempts through the use of the Internet, targeted email lists, and direct mail campaigns. The potential power of consumers is very great (after all, it helped start the American Revolution in the 1700s due to concerns over pricing and tea). Couple this potential with computer-communication technology and the means to realize the potential seems feasible (Zuriek & Mowshowitz, 2005). Another area of concern is web logs, or blogs. These are websites can cover a myriad of topics, depending on the theme of the blog. Some topics include politics, consumer products (electronics), breaking news, or personal thoughts. Marketing analysts can do content analysis on blogs in an effort to determine consumer response to campaigns, new products, or negative publicity.

Consumers are more educated, technologically savvy, and have a desire to be heard. Business has to decide how to manage the minefield of segmented consumer groups that don't like each other. Is it worth the cost? Many mainstream businesses are saying yes. The purchasing power of the U.S. gay and lesbian population will hit an estimated $641 billion in 2006 up from $610 billion in 2005, according to a study by Witeck-Combs Communications, a Washington, D.C.-based marketing firm specializing in the gay marketplace (Ehart, 2006). Such purchasing power makes gays and lesbians an attractive target market on the same footing as Hispanics, African-Americans, and Asians.

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BIOGRAPHY

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A PUZZLE FOR TEACHING THE CONSTANT GROWTH STOCK PRICING MODEL

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ABSTRACT

The constant growth stock pricing model is an important component of introductory corporate finance courses, and an important step on the way to understanding the general two-stage model. In this paper, I present a relatively fun puzzle based on the relationships implied by the constant growth model. When solving this puzzle, students are forced to look beyond the apparent simplicity of the model, ensuring that they are ready to incorporate its concepts into more general situations. However, the most satisfying part of the exercise is the enthusiasm with which students approach the exercise, since, after all, it is a puzzle!

INTRODUCTION

The constant growth model is a straightforward approach to quantifying the "art" of stock pricing.[1] It is more intuitively appealing and apparently realistic than its simplest version, the constant dollar dividend model, but it still looks deceptively simple.[2] These features make it the model to which we appeal most often when a stock price is needed within the context of a larger problem (for example, when we value convertible bonds (Brigham and Gapenski, 1997)). Yet it is often misused, misunderstood, or underestimated, even by those of us who teach it. In this paper, I present a "puzzle" that has helped my students master the relationships implied by the constant growth model. By the time they are able to complete this puzzle, which many of them actually think is *fun*, they have demonstrated their appreciation for the requirements of the model (e.g., the growth rate must be "small") and their facility with its calculations. They are also prepared to quickly and easily grasp the general two-stage model.

The paper proceeds as follows. I first present a brief motivation for the model, which emphasizes its development in infinite time. I then outline the implications of the model. Finally, I give an example of the puzzle, with answers.

INTRODUCING THE CONSTANT GROWTH MODEL

This section provides an overview of a relatively painless way to lead students of introductory corporate finance through the development of the constant growth model.

The constant growth model is used to calculate a stock's fundamental price—that is, what the stock *should* sell for. What it *does* sell for is something entirely different. For us to bother with stock pricing at all, we must believe not only that we can identify a mispricing that can be exploited (for example, buying if the fundamental price exceeds the market price), but also that the market will eventually come to agree with us, eliminating the discrepancy. This is a tall order.

However, if we do choose to undertake this pricing exercise, we begin as we would with any other asset: noting that we never want to pay more for something than what we are going to get out of it. Thus:

price = PV(all future cash flows). (1)

For stocks, this means that:

price = PV(dividends received during holding period and price received at sale), or

price = PV(dividends during holding period) + PV(price received at sale). (2)

All we need to do now is identify the amounts and timing of these cash flows.

Therein lies the rub. Unlike with bonds, we cannot simply look to the contract that exists to specify these cash flows. Instead, every input to a stock pricing model must be estimated. The presentation of stock pricing in an introductory finance course boils down to leading the students through this process of estimation.

We can start by making some plausible assumptions. (Of course, the quality of a model does not depend on the plausibility of its assumptions, which students should recognize.) First, assume that you are the only seller of a desirable stock. You have three types of interested buyers, who differ only by their desired holding periods: Zeb, who has an expected holding period of one year; Jessica, who plans to hold for five years; and Erik, who has no plans to ever sell (and to whom we therefore assign a holding period of infinity). Do you care about your potential buyers' holding periods? Does any seller ever care about the characteristics of his buyers? The answer to the latter question is "maybe": we can suppose, for example, that a conscientious breeder of registered puppies would not want to sell one to someone she deemed suspicious, or perhaps that the designer of a beautiful home may not want to sell it to someone with poor taste.[3] However, it is hard to imagine that the seller of a stock would feel emotionally attached to it, and so we suspect that you wouldn't care about your buyers' plans.

However, what if you did? It would not do you any good anyway, since you would be unable to price discriminate. Stocks are essentially commodities, and therefore your attempt to set different prices for different buyers would fall apart (through the development of a black market, for example).[4] Thus, our first assumption is that we cannot price discriminate when determining stock prices: all buyers pay the same price. This then means that price is independent of the buyer's holding period. This is extremely convenient, since it means we can develop our model in the easiest possible context—using the buyer with the most tractable holding period—then extrapolate that price to buyers with all holding periods. Given what we know about infinite series, that most tractable of holding periods will be Erik's: infinity.[5] This, then, is our final assumption: we can develop our model in infinite time.

Using an infinite holding period makes our model for price:

price at time t = PV(dividends from time [t+1] through time ∞), (3)

or

$$P_t = D_{[t+1]}/(1+i)^1 + D_{[t+2]}/(1+i)^2 + D_{[t+3]}/(1+i)^3 + \ldots, \quad (4)$$

where D_t is the dollar dividend paid at time t, and i is the market's periodic required rate of return for stocks of this risk class. This is the generic form of the stock pricing model, known as the dividend discount model (DDM).

Since the DDM is obviously intractable, we must posit various patterns for our infinite series of dividends. The constant growth model is the result of one such assumption: that dividends grow at the rate g% per period. That is:

$$D_{t+j} = D_t*(1+g)^j. \quad (5)$$

Substituting into the DDM, we have:

$$P_t = D_{[t+1]}/(1+i)^1 + D_{[t+1]}*(1+g)^1/(1+i)^2 + D_{[t+1]}*(1+g)^2/(1+i)^3 + \ldots, \quad (6)$$

which is a geometric series that converges to:

$$P_t = D_{[t+1]}/(i-g), \quad (7)$$

as long as $i > g$.[6] This is the constant growth model.

At this point, students should be reminded that the restriction that $i > g$ is not only necessary to make the series converge, but is also an economic requirement. The constant growth rate must be sustainable *to infinity*. The mathematical $i > g$ requirement should remind users that the constant growth model is for firms that are like parasites: parasites cannot continue to grow faster than their hosts, and companies cannot continue to grow faster than their economies. This is the point that is so often glossed over when this model is used cavalierly. It is also the reason that the derivation in infinite time is valuable, even though students may find all the infinity talk painful, especially when the final equation turns out to look so simple.

Now that students have the model, it is time to develop its implications and to apply this knowledge to the puzzle.

IMPLICATIONS OF THE CONSTANT GROWTH MODEL

Many of the "implications" mentioned here are really just rearrangements—different ways of looking at the constant growth expression. However, it is useful to point them out explicitly to students, who may otherwise overlook them.

(A) Price Grows at the Rate g Per Period, Too
Since $P_{[t+j]} = D_{[t+j+1]}/(i-g)$ and $D_{[t+j+1]} = D_{[t+1]}*(1+g)^j$, then $P_{[t+j]} = [D_{[t+1]}*(1+g)^j]/(i-g) = [D_{[t+1]}/(i-g)]*(1+g)^j = P_t*(1+g)^j$. Price gets pulled up by dividends, resulting in its growing at the same rate as dividends.

(B) Any Two Dividends or Prices Define the Constant Growth Rate, g
Since $D_{[t+j+1]} = D_{[t+1]}*(1+g)^j$, $g = [D_{[t+j+1]}/D_{[t+1]}]^{1/j} - 1$. The same goes for prices (and for earnings per share, for that matter).[7]

(C) The Required Rate of Return (i) Equals the Dividend Yield (dy) Plus g
The required return for any stock can be expressed as $(D_{t+1}/P_t) + [(P_{t+1} - P_t)/P_t]$, or [the dividend yield + the capital gains yield]. In all basic stock pricing models, we assume that i stays constant. However, we do not always assume that the components of i remain the same: in the general case, as long as their sum is i, they are free to change period by period. In the constant growth model, on the other hand, P_{t+1} is always equal to $P_t*(1+g)$, so that $(P_{t+1} - P_t)/P_t = [P_t*(1+g) - P_t]/P_t = g$. We can express this concept in many other ways:

(D) $i = dy + g$

(E) $dy = (i-g) = D_{[t+j+1]}/P_{[t+j]}$, for any t and j

(F) Capital Gains Yield = g

(G) The Dividend Yield For All Periods Is The Same

(H) The Capital Gains Yield For All Periods Is The Same

I will often summarize these points by giving students some tips for working through the puzzle:

- dividends get bigger over time, unless g=0
- prices get bigger over time, unless g=0
- given any two dividends, you can find g
- given any two prices, you can find g
- given a dividend and g, you can find any other dividend
- given a price and g, you can find any other price
- given a dividend and the prior period's price, you can find the dividend yield
- given dividend yield and g, you can find i
- i > g

AN EXAMPLE OF THE PUZZLE

There are four general types of statements that I use in the puzzle, each of which is illustrated in the example below. First, there are straightforward rate equalities (such as "i = 15%" or "dy = 12.25%"). Students usually start with these, trying to propose consistent sets of i, g, and dy values. Then there are algebraic manipulations of the rate relationships, which are often much more challenging. For example, if we have a statement of the form "$D_{12}/P_{17} = .1040987$," students would need to manipulate their various dy and growth rate values to solve for $dy/(1+g)^6$ (or actually solve for D_{12} and P_{17}). Third, there are cash flow statements giving amounts for various dividends or prices. These require students to test whether two dividends or prices can be linked with a specific growth rate, or whether a dividend and a price generate one of the known dividend yields. Finally, there are conceptual statements such as "this stock is overvalued if the market price is $50." These remind students about the whole point of stock pricing: we are drawing a distinction between the market price (what the price *is*) and the fundamental price (what the price *should be*), in order to identify trading opportunities.

By the time a student has worked through one or two examples of the puzzle, she should be fluent with all of the model's implications. I usually assign a puzzle after first having students do the most basic type of problem (such as: "Given that i=*x*, g=*y*, and P_0=*z*, find dy, P_{12}, D_6," etc.) and then going through an example puzzle in class. That has proved to be adequate preparation.

The Rules

Each of the statements below refers to one of three constant growth stocks, cleverly named A, B, and C. Determine which stock belongs to each statement.

The Puzzle

An example puzzle is presented in Figure 1.

Figure 1: The Puzzle

$dy = 7.95\% + g$	(1)		**C**	(13)	$P_3 = \$92.7495$
$D_7/P_6 = D_{12}/P_{11} = .1225$	(2)			(14)	$i = 15.00\%$
$D_1 = \$3.5775$	(3)			(15)	fundamental price = $85.50
$[D_{10}/D_4]^{1/6} - 1 = .0275$	(4)			(16)	this stock is overvalued if market price = $65.12
$D_{16}/i = \$45.00$	(5)			(17)	D_{14}/P_{13} for this stock = D_{14}/P_{13} for stock B
required return to equity = 9.20%	(6)			(18)	$P_{12}/(1.0125)^3 = P_9$
you should buy this stock if market price = $150.75	(7)			(19)	$D_1 = \$10.4738$
$P_{11}*(.0795) = \$22.7852$	(8)		**A**	(20)	$P_4 = \$262.7363$
$P_0 = \$250.0000$	(9)			(21)	$(P_{13}/P_9) - 1 = .050945$
$(i-g) + [(P_{17} - P_{16})/P_{16}] = 7.95\%$	(10)			(22)	$D_6 = \$11.9953$
$D_{10} = \$13.3702$	(11)			(23)	$D_7 = \$3.5775$
$g + dy = 0.15$	(12)			(24)	$D_6/P_4 = 8.0494\%$

I always provide a detailed answer so that students can check their work or identify any problems that they are having. What follows is an example of an answer key for the puzzle above. (Please note that each statement above is numbered; those numbers will be used below to help us keep track of our work.)

The Answer

The easiest way to start this problem is to isolate all of the i, g, and dy values, then see if we can match them up. Toward that end, here are some notes about various statements:

dy statements

(2) $D_7/P_6 = D_{12}/P_{11} = .1225$

(8) $P_{11}*(.0795) = \$22.7852$

i statements

(6) required return to equity = 9.20%

(10) $(i-g) + [(P_{17} - P_{16})/P_{16}] = 7.95\%$

(12) $g + dy = 0.15$

(14) $i = 15.00\%$

g statements

(4) $[D_{10}/D_4]^{1/6} - 1 = .0275$

(18) $P_{12}/(1.0125)^3 = P_9$

From the i statements, we know that our three required returns are 9.2%, 7.95%, and 15%. The dividend yield statements tell us that two of our dy values are 12.25% and 7.95%. Finally, since g links two prices together, we can tell from the g statement that one of the stocks has a growth rate of 1.25%.

Here is another valuable statement:

(5) $D_{16}/i = \$45.00$

This is the stock-pricing model for no-growth stocks. It tells us that one of our stocks has g = 0% and P = $45.00.

Given our rate information, we can match up the pieces as shown in Table 1.

Table 1: Required Return Component Matches

g	dy	i
0.00%	7.95%	7.95%
2.75%	12.25%	15.00%
1.25%	7.95%	9.20%

Now, we just need to know how to associate them with the specific stocks.

The easiest thing to do is to note that, since one of the stocks is in zero-growth, its price must stay constant at $45.00. However, we are given other future stock prices for both A and C, so the $45 stock must be B. This gives us:

(1)	$dy = 7.95\% + g$	B
(5)	$D_{16}/i = \$45.00$	B
(10)	$(i-g) + [(P_{17} - P_{16})/P_{16}] = 7.95\%$	B

(Note that statement (1) works when g = 0%.) Now, if P = $45 and dy = 7.95%, then D = $3.5775, so:

(3)	$D_1 = \$3.5775$	B
(23)	$D_7 = \$3.5775$	B

Now that we have identified stock B as the no-growth stock, let us see if we can match the other values to A and C. We can start with C's P_3 of $92.7495. If this is the stock that is growing at 2.75%, then we would expect a P_0 of $\$92.7495/(1.0275)^3 = \$85.50$. We have such a price! Now we know:

(2)	$D_7/P_6 = D_{12}/P_{11} = .1225$	C
(4)	$[D_{10}/D_4]^{1/6} - 1 = .0275$	C
(12)	$g + dy = 0.15$	C
(14)	$i = 15.00\%$	C
(15)	fundamental price = \$85.50	C

We also now know that stock A must be the one with the 9.20% required return:

(6)	required return to equity = 9.20%	A
(17)	D_{14}/P_{13} for this stock = D_{14}/P_{13} for stock B	A
(18)	$P_{12}/(1.0125)^3 = P_9$	A

A must also be the one with the last remaining P_0:

(9)	P_0 = \$250.0000	A

Here is another A statement:

(8)	$P_{11}*(.0795)$ = \$22.7852	A

We can link this with A because it is saying "P_{11} times the dividend yield equals D_{12}, and D_{12} is \$22.7852." B also has a dividend yield of 7.95%, but its price is always \$45.00 and its dividend is always \$3.5775.

Let us review our P_0 assignments and knock off some "under-" and "overvalued" statements. Table 2 summarizes our work so far.

Table 2: Summary of Assigned Stock Features

g	dy	i	P_0	Stock
0.00%	7.95%	7.95%	\$ 45.00	B
2.75%	12.25%	15.00%	\$ 85.50	C
1.25%	7.95%	9.20%	\$250.00	A

Given these prices, we can see that:

(7)	you should buy this stock if market price = \$150.75	A
(16)	this stock is overvalued if market price = \$65.12	B

Now let us look at some manipulations of basic data. For example, statement (21) asks us to quantify the ratio (P_{13}/P_9). Since:

$(P_{13}/P_9) - 1 = (1+g)^4 - 1,$ (8)

we can link this statement to one of the two positive growth rates we have by substituting each g into (8) and seeing if we get the 5.0945% result. We find a match using A's growth rate of 1.25%, so:

(21) $(P_{13}/P_9) - 1 = .050945$ A

Now, here is a statement that involves a more difficult manipulation:

(24) $D_6/P_4 = 8.0494\%$

A dividend divided by a price is like a dividend yield, but the D is supposed to be *just after* the P. Thus, D_5/P_4 is a dividend yield, but D_6/P_4 is not. However, we can rearrange the given ratio as follows:

$D_6/P_4 = D_5*(1+g)^1/P_4 = [D_5/P_4]*(1+g)^1 = dy*(1+g)^1.$ (9)

Thus, we are looking for a value just a bit bigger than our dividend yield. Again substituting in A's data, we find that (1.0795)*(1.0125) = 8.0494%, so:

(24) $D_6/P_4 = 8.0494\%$ A

At this point, we are left with only these three cash flow statements:

(11) $D_{10} = \$13.3702$
(19) $D_1 = \$10.4738$
(22) $D_6 = \$11.9953$

Using what we know about dividend yield and P_0 to find D_1, we can assign these statements to stocks A and C, as shown in Table 3.

Table 3: Stocks' Initial Prices and Dividends

dy	P_0	D_1	Stock
7.95%	$ 45.00	$ 3.5775	B
12.25%	$ 85.50	$10.4738	C
7.95%	$250.00	$19.8750	A

Now we see that all of these dividends must belong to C! We can verify this by checking the growth rate implied by each pair of dividends:

$(D_6/D_1)^{1/5} - 1 = 2.75\% =$ g for stock C (10)

$(D_{10}/D_1)^{1/9} - 1 = 2.75\% =$ g for stock C (11)

$(D_{10}/D_6)^{1/4} - 1 = 2.75\% =$ g for stock C. (12)

Thus:

(11) $D_{10} = \$13.3702$	C
(19) $D_1 = \$10.4738$	C
(22) $D_6 = \$11.9953$	C

That completes the puzzle!

The Summary

The completed puzzle is presented below in Figure 2.

Figure 2: The Completed Puzzle

$dy = 7.95\% + g$	(1)	B	**C**	(13)	$P_3 = \$92.7495$
$D_7/P_6 = D_{12}/P_{11} = .1225$	(2)	C	C	(14)	$i = 15.00\%$
$D_1 = \$3.5775$	(3)	B	C	(15)	fundamental price = $85.50
$[D_{10}/D_4]^{1/6} - 1 = .0275$	(4)	C	B	(16)	this stock is overvalued if market price = $65.12
$D_{16}/i = \$45.00$	(5)	B	A	(17)	D_{14}/P_{13} for this stock = D_{14}/P_{13} for stock B
required return to equity = 9.20%	(6)	A	A	(18)	$P_{12}/(1.0125)^3 = P_9$
you should buy this stock if market price = $150.75	(7)	A	C	(19)	$D_1 = \$10.4738$
$P_{11}*(.0795) = \$22.7852$	(8)	A	**A**	(20)	$P_4 = \$262.7363$
$P_0 = \$250.0000$	(9)	A	A	(21)	$(P_{13}/P_9) - 1 = .050945$
$(i-g) + [(P_{17} - P_{16})/P_{16}] = 7.95\%$	(10)	B	C	(22)	$D_6 = \$11.9953$
$D_{10} = \$13.3702$	(11)	C	B	(23)	$D_7 = \$3.5775$
$g + dy = 0.15$	(12)	C	A	(24)	$D_6/P_4 = 8.0494\%$

CONCLUSIONS

Understanding the constant growth case is a prerequisite to understanding the general two-stage model. However, many textbook end-of-chapter problems on basic stock pricing do not rigorously test the students' knowledge of the relationships inherent in the constant growth case, so that students may be inadequately prepared for more difficult problems. For example, of 25 questions at the end of the "Equity Markets and Stock Valuation" chapter in *Essentials of Corporate Finance* by Ross, Westerfield, and Jordan (2007), thirteen involve the constant growth model. The structure of these questions can be mapped as shown in Table 4.

Table 4: Examples of Constant Growth Stock Pricing End-of-Chapter Questions

Inputs Given					**Answers to Find**
	D_0	g		i	P_0
	D_0	g		i	P_0
	D_1	g		i	P_0
	D_1	g		i	P_0
P_0	D_0	g			i
P_0	D_0	g			i
P_0	D_1	g			i
P_0	D_1	g			i
P_0	D_1	g		i	dy & cgy
P_0	D_1			i	g
P_0		g	dy	i	D_0
P_0		g		i	D_0
		g	dy		i

No question asks a student to consider more than one of the model's implied relationships for any given stock. However, forcing students to go beyond simple plug-and-chug exercises helps them appreciate the implications of the deceptively simple $D_1/(i-g)$ ratio. This appreciation will make it less likely that they will misuse the model (by assuming that it is appropriate for a company currently growing at 11% per year, for example) and more likely that they will more easily master the two-stage model.

In this paper, I present a puzzle that does force students to work more deeply with a few stocks, and to explicitly acknowledge the constant growth model's implications for those stocks. This puzzle has prepared my students well for the relative rigors of the two-stage model. More importantly for them, students often actually enjoy working through these exercises. They tell me that they are grateful for any spoonful of sugar that makes this fairly difficult course go down more easily.

ENDNOTES

1. This model is also called the "Gordon growth model" or the "Gordon/Shapiro model." See, for example, Brigham and Gapenski (1997), p. 309, and Brealey, Myers, and Allen (2006), p. 65.

2. The constant-dollar model is a special case of the constant growth model—the case of g=0%. However, the constant-dollar model is usually introduced as a separate model, before the more general constant growth model is presented.

3. These are examples I've encountered in real life.

4. Mansfield [1994] identifies the necessary conditions for third-degree price discrimination to be (1) "considerable differences in the price elasticity of demand" for the product, perhaps caused by differences in tastes or lack of substitutes; (2) the seller's low-cost ability to identify and segregate these groups; and (3) the inability for buyers to transfer the good among themselves. While we could perhaps assume that different expected holding periods could create differences in "tastes," we would still have to acknowledge that any particular issue of stock has many substitutes. As for the second and third requirements, we hold out even less hope for successful discrimination.

5. It is fun to ask students to guess whose holding period will be the most tractable. Zeb is usually their answer.

6. An infinite series of the form "sum = A + A*B + A*B^2 + A*B^3 + …" is a geometric series. These series converge to A/(1-B) if |B| < 1. In the constant growth case, A = D_1/(1+i), and B = (1+g)/(1+i), which is less than 1 if i > g.

7. The payout ratio is constant under the model's assumptions.

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CAPITAL INDUSTRY PRACTICE AND AGGRESSIVE CONSERVATIVE WORKING CAPITAL POLICIES IN NIGERIA

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ABSTRACT

This study investigates fifteen diverse industrial groups over an extended period to establish the relationship between aggressive and conservative working capital practices. Data were sourced from the annual reports of the companies and the publications of Nigerian Stock Exchange. Descriptive statistics were used for analyzing the data collected. Results strongly show that firms in differing industries have significantly different current asset management policies. Additionally, the relative industry ranking of the aggressive/conservative asset policies exhibit remarkable stability over time. It is evident that there is a significant negative correlation between industry asset and liability policies. Relatively aggressive working capital asset management seems balanced by relatively conservative working capital financial management. The study recommends that, a firm in deciding its working capital policies should consider the policies adopted in that industry in which it operates. A firm pursing aggressive working capital investment policy should match it with a conservative working capital financing policy.

INTRODUCTION

The problem of satisfying the conflicting requirement of corporate liquidity and profitability has remained a source of major concern to financial managers in the face of high level of competition, increasing cost of capital and hyperinflation. The success of any business organizations in achieving the above goals is often attributed to proficiency in planning and control techniques (Imegi et al 2003).

Pandey (1995) argues that the management of current assets is similar to that of fixed assets in the sense that both have an effect on risk and returns. According to Weinraub et al (1998), most finance textbooks begin their working capital sections with a discussion of the risk and return tradeoffs inherent in alternative working capital policies. High risk, high return on working capital investment and financing strategies are referred to as aggressive; intermediate risk returns strategies are called moderate or matching, while lower risk and return strategies are called conservative.

A conservative approach to working capital occurs when the company finances some or all of its temporary current assets with long-term funds. This approach involves high liquidity, low profitability and low risk. An aggressive approach to working capital occurs when the company finances some of its permanent current assets, along with all of its temporary current assets with short-term funds. This approach involves low liquidity, high risk and high profitability.

The operations of many companies are subject to seasonal or cyclical fluctuations requiring them to have both permanent and temporary current assets. Permanent current assets can be defined as the amount of current assets a company needs when it is at the trough of a cycle. Based on this definition, permanent current assets are similar to long-term assets, such as plant and equipment. Temporary current assets are those that rise and fall along with the company's seasonal or cyclical variations.

The objective of the study therefore is to determine if a significant difference exists in the aggressive/ conservative working capital among industries in Nigeria Thus from the above assumptions, the following research questions will be addressed in this paper. Do significant differences exist in working

capital policies in Nigeria? Do most industries follow aggressive working capital as a method of managing working capital in Nigeria? Do Nigerian industries maintain sufficient liquid resources to meet their current obligations?

The rest of the paper contains four sections. Section II provides a brief literature review and conceptual framework. Section III deals with research method while Section IV presents the results. Concluding remarks follow in Section V.

LITERATURE REVIEW

Chen and Shimerda (1981) examined why firms have different levels of working capital. They examined the strategic determinants of working capital (cash, short-term securities, accounts receivable and inventory) on a product line basis. Their final multiple regression models contained 19 variables pertaining to production, sales accounting, competitive position, and industry factors. They used this model to explain why working capital levels differ among firms both within and across industries. Weinraub and Visscher (1998) observed a tendency of firms with low current ratios levels to also have low levels of current liabilities. In their study, they examined ten diverse industry groups over an extended time period to determine the relative relationship between aggressive and conservative working capital practices. Hil, Satoris and Ferguson (1984) combined accounts receivable and payable into one issue and discovered that payees define date of payment as the date payment is received, while payers view payment as the postmark date.

Much of the literature focuses on the theoretical determination of optimal trade credit limits such as Schwartz (1974) and Scherr (1998), with some focusing on special subsets of business. For example, Ferconio and Lane (1991); and Kincaid (1993) looked at the healthcare industry. Belt and Smith (1991) examined Australian companies; Kim, Rowland and Kim (1992) examined Japanese manufacturers in the United States, etc. While each makes a positive contribution to the literature, the only study to address the issue of differences in aggressive/conservative working capital policies is Weinraub and Visscher (1998). However, their study focused on developed countries. No known research empirically examines the question of aggressive/conservative working capital policy in Nigeria.

Historically, working capital was considered to be a company's current asset, that is assets that consisted of cash and those that were easily convertible to cash within a short period of time, say one year. Merger Management Consultant (1998) noted that for most companies, the principal current assets are cash, short-term investments (sometimes referred to as marketable securities), accounts receivable, and inventory. However, Igben (1999) referred to working capital as the excess of current assets over current liabilities. (Current liabilities consist of bills and other debts that are due within a short period of time, usually a year or less.) According to Evans (1998), this modern definition of working capital is also called net working capital.

Aside from the traditional definitions of working capital, there is another way of presenting working capital that provides some additional insight. For example, the presentation of some company's balance sheet shows a different format. On the left are the company's assets (labeled as uses of funds). Uses are divided into two categories: short term uses (current assets) and long term uses (fixed and other non-current assets). However, on the right side are the sources of funds (liabilities and equity).

Companies use different approaches to finance current assets. For example a company could finance some of its short-term assets with permanent funds. In contrast, another company could follow a policy of having almost no working capital, meaning that it finances all of its short-term assets with temporary funds Omolumo (1997). Regardless of the degree to which a company is subject- seasonal or cyclical fluctuations- all companies need some minimum amount of current assets.

The working capital policy alternatives open to a firm depend, to a large extent, on its debt-equity ratio, rates of interest on current and long-term debts and the foreseeable net operating income. Different working capital policies involve a risk/return tradeoff because it deals with the nature of short versus long-term financing. The more aggressive a company's working capital policy, the more it relies on short-term. A company can adopt one of the three approaches to working capital, namely: matching approach, conservative approach and aggressive approach (Omolumo, 1997).

DATA AND METHODOLOGY

The data used in this study consist of selected variables from the financial statements of Nigerian firms listed on the Nigerian Stock Exchange. The financial data collected includes annual levels of current liability (C/L), current assets (C/A) and total assets (T/A) of the firms under investigation. The sample size for this study constitutes forty-two (42) quoted companies in Nigeria over a period of ten years (1994–2003). This study made use of secondary data, which were sourced from the annual reports of the firms and publications of Nigerian Stock Exchange (NSE) Fact Book. The data were analyzed, using cross tabulation, correlation analysis and ANOVA analysis. Summary statistics are presented in Table 1.

Table 1: Ten-Year Industry Means and Standard Deviations

Industry	Number of Companies	CA/TA		TCL/TA	
		Mean	STD	Mean	STD
Automobile & Tire	3	0.6256	0.0672	0.4581	0.0372
Breweries	1	0.5848	0.0718	0.3845	0.0572
Building Materials	3	0.4716	0.1353	0.5561	0.1974
Commercial/Services	1	0.7513	0.0947	0.3231	0.1299
Chemical and Paints	3	0.8104	0.0456	0.5703	0.0822
Conglomerates	3	0.6823	0.1035	0.6333	0.1568
Construction	2	0.8237	0.0282	0.8586	0.0265
Emerging Market	2	0.7445	0.0459	0.4910	0.0631
Food/Beverages & Tobacco	8	0.6793	0.0446	0.5249	0.0341
Health Care	5	0.6985	0.0904	0.4335	0.1160
Industrial/Domestic Product	4	0.6390	0.0623	0.5612	0.1009
Packaging	2	0.6014	0.0337	0.369	0.0728
Petroleum	2	0.7779	0.0537	0.7967	0.0596
Printing and Publishing	2	0.7117	0.0762	0.5962	0.9406
Textiles	1	0.5162	0.0655	0.3561	0.0516

Defining *DOA* to be the Degree of Aggressiveness, *CA* to be Current Assets and *TA* to be Total Assets, then to measure the degree of aggressiveness, the *DOA* is computed as follows:

$$DOA = \frac{CA}{TA}$$

Defining *TCL* to be the Total Current Liabilities, the total current liabilities and the total assets are used to measure the *DOAP,* degree of aggressive financing policy as follows, with a high ratio being relatively more aggressive.

$$DOAP = \frac{TCL}{TA}$$

RESULTS

In this section, the results of the analysis are presented. Three sets of analysis are presented. First, the results of tests regarding differences in policies are presented. Second, evidence regarding stability between policies are provided. Finally results regarding the relationship between asset/investment and Financing policies are presented.

The main objective of this study as previously stated is to determine if a significant difference exists in the aggressive/conservative working capital policies among industries. Industry investment policy, measured by Current Assets/Total Assets, was first examined. To determine if significant differences exist in the mean of the Current Asset to Total Asset ratio two methodologies were employed, an ANOVA analysis and a Tukey's Honestly Significantly Different (HSD) test. A one-way ANOVA was applied to the set of 15 ten-year average ratio means. The results are presented in Table 2(a) The observed F-ratio of 17.344, is significant at 1% level of significance, thus the differences in the means are highly significant. To further examine the strength of differences between industry values, Tukey's HSD test was performed, comparing the industry means on a paired sample basis. The results of the test, which are also shown in Table 2(a), show that 47 out of 105 comparisons are significantly different at the 1% level. Thus, both the ANOVA and Tukey's HSD tests show a distinctive difference in the asset management policies between industries.

Table 2(b) provides additional information on specific industries whose asset management policies are not significantly different from one another at the 1% level. As indicated in the table, there are 8 homogeneous groups. The differences between industries within any group were not significant, but between two different groups the differences were significant.

Next, financing policy is examined by performing a one-way ANOVA on the Total Current Liability/Total Asset ratio tested differences in the relative degree of aggressive/conservative liability management. The results are presented in Table 3(a) The observed F-ratio of 25.219 is significant at 1% level. Thus, the differences in the means are highly significant. The Tukey's HSD test was also performed to help examine the strength of differences between industry values. The results of the test, which are also contained in Table 3(a), reveal that 50 of the 105 comparisons showed a significant difference at the 1% level. Therefore, both the AVOVA and Tukey's HSD tests confirmed the existence of significant difference in the liability management policies between industries. An examination of Table 3(b) reveals that there are 7 homogeneous groups, within which liability management policies of the specified industries are not significantly different from one another. It is apparent that significant industry differences do exist in the relative degree of aggressive/conservative working capital policies for both asset and liability management. However, both the ANOVA and Tukey's HSD tests show that these differences are generally broader and more significant when examining liability management.

Table 2(a): Significance levels for industry mean differences of the Current Assets / Total Asset Ratio

	AUTO	BREW	BLDN	COMM	CHEM	CONG	CONS
BREW	0.0408	-	-	-	-	-	-
BLDN	0.1540**	0.1132**	-	-	-	-	-
COMM	-0.0957	-0.1365**	-0.2497**	-	-	-	-
CHEM	-0.1848**	-0.2256**	-0.3388**	-0.0891	-	-	-
CONG	-0.0567	-0.0975	-0.2107**	0.0390	0.1281**	-	-
CONS	-0.1981**	-0.2389**	-0.3521**	-0.1024	-0.0133	-0.1414**	-
EMERG	-0.1189**	-0.1597**	-0.2729**	-0.0232	0.0659	-0.0622	0.0792
FOOD	-0.0537	0.0945	-0.2077**	0.0420	0.1311**	0.0030	0.1444**
HELT	-0.0729	-0.1137	-0.2269**	0.0228	0.1119**	-0.0162	0.1252**
IND. PRO	-0.0134	-0.0542	-0.1674**	0.0823	0.1714**	0.0433	0.1847**
PACK	0.0242	-0.0166	-0.1298**	0.1199**	0.2090**	0.0809	0.2223**
PETR	-0.1523**	-0.1931**	-0.3063**	-0.0566	0.0325	-0.0956	0.0458
PRIN	-0.0861	-0.1269**	-0.2401**	0.0096	00.0987	-0.0294	0.1120**
TEXT	0.0644	0.0236	-0.0896	0.1601**	0.2492**	0.1211**	0.2625**

	EMERG	FOOD	HELT	IND. PRO	PACK	PETR	PRIN
BREW	-	-	-	-	-	-	-
BLDN	-	-	-	-	-	-	-
COMM	-	-	-	-	-	-	-
CHEM	-	-	-	-	-	-	-
CONG	-	-	-	-	-	-	-
CONS	-	-	-	-	-	-	-
EMERG	-	-	-	-	-	-	-
FOOD	0.0652	-	-	-	-	-	-
HELT	0.0460	-0.0192	-	-	-	-	-
IND. PRO	0.1055	0.0403	0.0595	-	-	-	-
PACK	0.1431**	0.0779	0.0971	0.0376	-	-	-
PETR	-0.0334	-0.0986	-0.0794	-0.1389**	-0.1765**	-	-
PRIN	0.0328	-0.0324	-0.0132	-0.0727	-0. 1103	0.0662	-
TEXT	0.1833**	0.1181**	0.1373**	0.0778	0.0420	0.2167**	0.1505**

*This table shows significance levels for industry mean differences of the Current Assets / Total Asset Ratio (F-Test and Tukey's HSD). ** indicates significance at the 1 percent level*

Table 2 (b): Homogeneous Subsets each containing Industries with no significant difference in Their Current Assets/Total Assets Ratio

SUBSETS							
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
BLDN	TEXT	BREW	PACK	AUTO	FOOD	CONG	PRIN
TEXT	BREW	PACK	AUTO	IND. PRO	CONG	HELT	COMM
	PACK	AUTO	IND. PRO	FOOD	HELT	PRIN	EMERG
	AUTO	IND. PRO	FOOD	CONG	PRIN	COMM	PETR
	IND. PRO	FOOD	CONG	HELT	COMM	EMERG	CHEM
	FOOD	CONG	HELT	PRIN	EMERG	PETR	CONS
		HELT	PRIN	COMM	PETR	CHEM	
			COMM	EMERG			

This table shows industry subsets with homogeneous Current Assets/Total Assets Ratios.

Table 3(a): Significance levels for industry mean differences of the Total Current Liability / Total Asset Ratio (F-Test and Tukey's HSD tests**)**

	AUTO	**BREW**	**BLDN**	**COMM**	**CHEM**	**CONG**	**CONS**
BREW	0.0736	-	-	-	-	-	-
BLDN	0.0980	0.1716**	-	-	-	-	-
COMM	0.1350	0.0614	0.2330**	-	-	-	-
CHEM	0.1122	0.1858**	0.0142	0.2470**	-	-	-
CONG	0.1752**	0.2488**	0.0772	0.3020**	0.0630	-	-
CONS	0.4005**	0.4741**	0.3025**	0.5355**	0.2885**	0.2253**	-
EMERG	0.0329	0.1065	0.0651	0.1679**	0.0793	0.1423	0.3760**
FOOD	0.0668	0.1404	0.0312	0.2018**	0.0454	0.1084	0.3337**
HELT	0.0246	0.0490	0.1226	0.1104	0.1368	0.1998	0.4251**
IND. PRO	0.1036	0.1767	0.0051	0.2381**	0.0091	0.0721	0.2974**
PACK	0.0891	0.0155	0.1871**	0.0459	0.2013**	0.2643**	0.4896**
PETR	0.3386**	0.4122**	0.2406**	0.4736**	0.2264**	0.1634**	0.0619
PRIN	0.1381	0.2117**	0.0401	0.2731**	0.0259	0.0371	0.2624**
TEXT	0.1020	0.0284	0.2000**	0.0330	0.2142**	0.2772	0.5025**
	EMERG	**FOOD**	**HELT**	**IND.** PRO	**PACK**	**PETR**	**PRIN**
BREW	-	-	-	-	-	-	-
BLDN	-	-	-	-	-	-	-
COMM	-	-	-	-	-	-	-
CHEM	-	-	-	-	-	-	-
CONG	-	-	-	-	-	-	-
CONS	-	-	-	-	-	-	-
EMERG	-	-	-	-	-	-	-
FOOD	0.0390	-	-	-	-	-	-
HELT	0.0575	0.0914	-	-	-	-	-
IND. PRO	0.0720	0.0368	0.1277	-	-	-	-
PACK	0.7220	0.1559**	0.0645	0.1922**	-	-	-
PETR	0.3057**	0.2718**	0.3632**	0.2355**	0.4277**	-	-
PRIN	0.1052	0.0713	0.1627**	0.0350	0.2272**	0.2005**	-
TEXT	0.1349	0.1688**	0.0774	0.2051**	0.0227	0.4406**	0.3875**

*This table shows significance levels for industry mean differences of the Total Current Liability / Total Asset Ratio. **Significant at 1% level.*

Table 3(b): Homogeneous Subsets each containing Industries with no Significant Difference in Their Total Current Liabilities/Total Assets Ratio

SUBSETS						
1	**2**	**3**	**4**	**5**	**6**	**7**
COMM	TEXT	PACK	HELT	AUTO	EMERG	PETR
TEXT	PACK	BREW	AUTO	EMERG	FOOD	CONG
PACK	BREW	HELT	EMERG	FOOD	BLDN	
BREW	HELT	AUTO	FOOD	BLDN	IND. PRO	
HELT	AUTO	EMERG	BLDN	IND. PRO	CHEM	
AUTO	EMERG	FOOD	IND. PRO	CHEM	PRIN	
			CHEM	PRIN	CONG	

This table shows industry subsets with homogeneous Total Current Liabilities/Total Assets Ratios.

Next, the stability between policies are examined. Rank order correlations were used as a test of relative stability. For each of the ten years, the Current Asset/ Total Asset ratio was computed for each industry

and then ranked from the highest to lowest ratio. The base year rankings (1994) were then sequentially compared to the rankings of each succeeding year. The results obtained are presented in Table 4. There is evidence of strong stability in each industry's relative level of aggressiveness with respect to working capital investment over time, except in 2001 when there was significant change in each industry's relative level of aggressiveness.

The industries were also ranked each year on the basis of Current Liabilities to Total Assets ratios, and the computed rank order correlations are also presented in Table 4. The results obtained showed that each industry strongly maintained its relative level of aggressiveness with respect to working capital financing over time until 2002 when there were significant changes in the relative levels of aggressiveness in the industries. These changes continued in 2003. So there was instability in liability management policies in year 2002 and 2003. Hence, working capital investment policy was more stable than working capital financing policy over time.

Table 4: Rank Order Correlation and Z Values Between Base Year (1994) and Each Succeeding Year for Current Assets/Total Assets and Total Current Liabilities/Total Assets

	CA/TA		TCL/TA	
Year	**Correlation**	**Z value**	**Correlation**	**Z value**
1995	0.893	**	0.894	**
1996	0.752	**	0.912	**
1997	0.679	**	0.883	**
1998	0.757	**	0.731	**
1999	0.699	**	0.831	**
2000	0.704	**	0.608	*
2001	0.532	*	0.658	**
2002	0.764	**	0.481	
2003	0.768	**	0.188	

*This table shows the rank order correlations and Z Values between the base year (1994) and each succeeding year. The test variables are Current Assets/Total Assets and Total Current Liabilities/Total Assets. * indicates Significance at the 5% level, **indicates significance at the 1% level*

Finally, the relationship between Asset/Investment and Financing Policies are examined. The relationship between the asset management policy and the financial management policy, that is, how aggressive asset management corresponded to aggressive financial management. This relationship was tested on a year-by-year basis. For the first year, the industries were ranked from low CA/TA ratios to high ratios, corresponding to ascending order of relatively aggressive asset management policies. Rankings were also ordered, for the first year, from high to low TCL/TA ratios, corresponding to an ascending order of relatively aggressive financing policies. Rank order correlation between the two policies was then computed for year one. This procedure was repeated for each of the remaining nine years and the results are presented in table 4 above.

The results in the table reveal, without exception, that the correlations between the two policies were negative each year, and they were significant at the 1 or 5% level except for years 2000, 2001, 2002 and 2003. It is evident that industries, which pursued relatively aggressive asset policies simultaneously, followed relatively conservative financing policies.

The results reported in Table 5, at least for the first six years, showed that there is a significant negative relationship between the level of aggressiveness of asset management policies and the level of aggressiveness of liability management policies at 1 or 5% level. This means industries that use aggressive asset policy tend to pursue conservative liability management policy.

Table 5: Rank Correlation, Per Year, of Aggressive Asset Policies and Aggressive Financing Policies

Year	Correlation	Z value
1994	-0.525	*
1995	-0.743	**
1996	-0.876	**
1997	-0.539	*
1998	-0.625	*
1999	-0.552	*
2000	-0.511	
2001	-0.232	
2002	-0.375	
2003	-0.261	

*This table shows the rank correlation of aggressive asset and financing policies. ** indicates significance at the 1 percent level and * indicates significance at the 5 percent level.*

CONCLUDING COMMENTS

This study examined the relative relationship between the aggressive/conservative working policies of firms in fifteen (15) different industries in Nigeria. Regarding the degree of aggressive asset management, the industries had distinctive and significantly different policies. In addition, the relative nature of asset policies between industries exhibited remarkable stability over the fifteen years studied. Industrial policies concerning the relative degree of aggressive liability management also were significantly different, but not to the same extent or with the same stability.

This study also showed a significantly negative correlation between industry asset and liability policies. In general, it appears that when relatively aggressive working capital policies are followed they are balanced by relative conservative working capital policies. A firm in deciding its working capital policies should consider the policies adopted in the industry in which it operates as working capital policies are industry specific and so differ from one industry to another.

A firm pursing aggressive working capital investment policy should match it with a conservative working capital financing. This is important to mitigate the risk being faced under aggressive working capital investment policies by safety involved under conservative working capital financing policy.

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BIOGRAPHY

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OIL AND ETHANOL IN LATIN AMERICA AND ASIA-PACIFIC

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ABSTRACT

Oil prices have escalated dramatically in recent years. As a result, observers have renewed interest in the possibility of producing ethanol. For some time, oil experts have been predicting the exhaustion of oil supplies. To date, reality has contradicted that position. However, there is consensus of the urgency to search for oil-substitutes including ethanol. Additionally, ethanol is an environmentally acceptable alternative. This study concludes that the growth of oil prices has the same critical importance for Latin America as for Asia-Pacific. The study examines the potential of substituting ethanol for petroleum in selected countries of Latin America and Asia-Pacific. The conclusion is that only Colombia, Peru, Malaysia, and Thailand have the potential because they cultivate sugarcane; Chile and South Korea do not have sugarcane production. The country with the greatest potential is Colombia, with a potential ethanol output greater than the equivalent fuel imports. The countries with medium potential are Thailand and Peru and the country with the smallest potential is Malaysia. Korea and Chile do not have the potential to replace oil imports, because they are located in a temperate region of the world; they must look for alternatives in other agricultural raw materials or in foreign trade.

INTRODUCTION

The objectives of this study are as follows: (a) to present the current situation with respect to the magnitude of and projections for petroleum imports for selected countries of Latin America and Asia-Pacific; and (b) to measure the potential to replace ethanol instead of petroleum in the energy consumption of the selected countries.

The price of crude petroleum and the value of oil imports have increased dramatically in the last two years. Crude petroleum and fuel imports of three selected countries of Latin America (Chile, Colombia, and Peru) reached $9.1 billion in 2005. The value of imports has increased 250% from the level of year 2001 (Table 1).

Table 1: Petroleum Imports and Fuels, Selected Countries, Latin America 2001-2005, Million $

	2001	**2002**	**2003**	**2004**	**2005**
Chile	2589	2463	3131	4469	6229
Colombia	198	189	239	262	544
Peru	908	975	1376	1753	2324
Totals	3695	3627	4746	6484	9107

Source: Central Bank of Chile (2006), DANE (2006), Central Bank of Peru (2006)

Petroleum and fuel imports of three selected nations of Asia-Pacific (Korea, Malaysia, and Thailand) reached U.S. $42 billion in 2004 and grew by 30% in 2005, reaching approximately $55 billion. These imports have doubled from the levels of 2001 (Table 2).

Table 2: Petroleum Imports and Fuels, Selected Countries, Asia-Pacific 2001-2005, Billion $

	2001	2002	2003	2004	2005
Korea	21.2	20.7	24.1	31.5	41.4
Malaysia	1.3	1.1	1.5	1.9	2.6*
Thailand	4.6	4.8	5.8	8.8	14.0*
Total	27.1	26.6	31.4	42.2	58

*Source: ADB (2006). *Estimated from growth rates of imports of fuels.*

It is clear that the demand for petroleum imports is much greater in the industrialized nations of Asia-Pacific than in the mid-industrialization countries of Latin America. The combined imports of these three countries of Asia-Pacific are nearly six times the combined imports of Chile, Colombia, and Peru, in the whole period 2001-2005. Table 3 presents oil imports of the selected countries Korea, Malaysia, and Thailand in terms of physical volumes. The imports of Korea are much greater than those of Malaysia and Thailand and represent three-quarters of the imports of the three countries combined in the period 2000-2003 (Table 3).

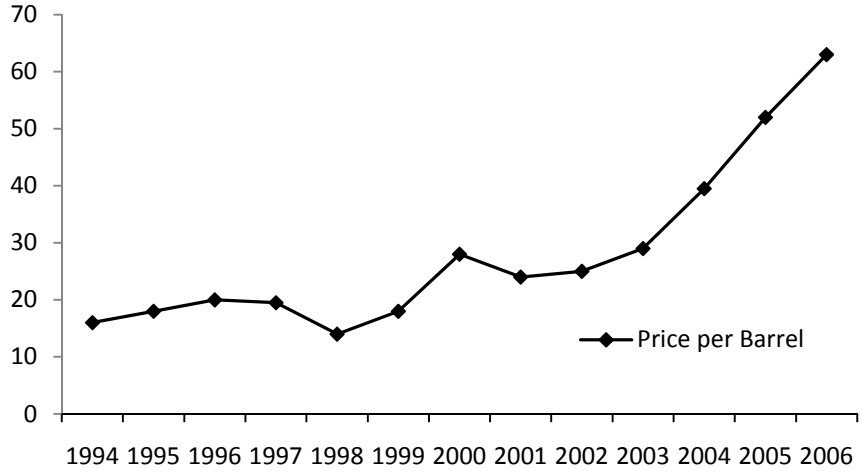
Table 3: Petroleum Imports and Fuels, Countries Selected Asia-Pacific 2001-2005, Million Metric Tons

	2001	2002	2003	2004	2005
Korea	138.5	132.0	132.5	133.8	
Malaysia	8.5	6.8	8.0	7.9	9.1
Thailand	29.8	30.8	32.1	37.0	
Totals	176.8	169.6	172.6	178.7	

Source: ADB (2006).

The conclusion is that oil imports and oil price growth have a critical and similar importance for the countries of Latin America as for those of Asia-Pacific. In both groups of countries, a high dependency on petroleum imports exists. This high dependency on petroleum may continue to grow in the future, with future growth depending on the growth tendencies of the international price of oil that currently exceeds $60 per barrel and is on an upward trend. (Figure 1).

Figure 1: Evolution of Petroleum Price 1999-2006 ($/Barrel)



Source: IMF, 2006

The high price of petroleum is the main reason that observers have begun to examine ethanol production now. The current level of petroleum price has resulted in a consensus of the urgent need to look for oil

substitutes, including ethanol. The main use of ethanol at present is as an additive to gasoline, but in the future, ethanol may be the primary fuel.

Additionally, preoccupation with the environment makes a turn to bio-fuels an acceptable alternative of renewable energy. The main bio-fuel, with accessible and efficient technology and low costs that can compete with petroleum, is ethanol. Consequently, the thesis of this study is that ethanol is the fuel of the future.

The scenario of the petroleum price and its impact on fuel imports in the selected countries of Latin America (Colombia, Peru, and Chile) and of Asia-Pacific (Korea, Thailand, and Malaysia) has already appeared in previous tables. The numbers demonstrate that the situation regarding oil imports is critical and similar in regard to both Latin America and Asia-Pacific, because both groups of countries have a high dependency on petroleum.

The following sections present an analysis of the potential to replace petroleum with ethanol in energy consumption of the selected countries. First, we present the possibilities of sugarcane production in specific countries of Latin America and Asia-Pacific. Then a comparative analysis is made of sugar and ethanol markets. Finally, we display the calculation of the potential to replace petroleum imports.

SUGARCANE PRODUCTION IN LATIN AMERICA AND ASIA-PACIFIC

The situation of petroleum imports is similar in regard to both Latin America and Asia-Pacific because both regions have a high dependency on petroleum imports. The possibilities of ethanol production can also be seen as similar in Latin America and Asia-Pacific. This is because in both regions some countries are located mainly in the tropical zone of the globe: between the Tropic of Cancer and the Tropic of Capricorn, to the north and the south of the equatorial line. The exceptions in the sample are Korea in Asia-Pacific and Chile in Latin America, because these countries are located mainly in the temperate zones of the world.

In the selected Latin countries, only Colombia and Peru cultivate sugar cane; Chile does not have significant production. In the selected countries of Asia-Pacific sugarcane production takes place only in Malaysia and Thailand; South Korea does not have significant sugarcane production (Table 4).

Table 4: Sugarcane Production in Latin America and Asia-Pacific (Million Metric Ton)

	2001	2002	2003	2004	2005
Colombia	33	37	39	40	39.8
Peru	8	9.1	9.7	9.7	7.1
Malaysia	1.6	1.5	1.3	1.2	1.2
Thailand	49.6	60	74.3	65	49.6
Totals	92.2	107.6	124.3	115.9	97.7

Source: FAOSTAT, 2006

In Colombia and Peru, the cane is cultivated exclusively for sugar production. No ethanol-from-cane production has developed in these countries. Colombia produced four times the output of Peru in 2001-2005. In Asia-Pacific the cane-producing country is basically Thailand, while the production of Malaysia represents only 2% of the Thai production, and Korea does not have any sugarcane production.

On the other hand, areas and yields of sugarcane production in all Latin America have had a slow but continuous growth in the recent period. Brazil is, by far, the main sugarcane producer in Latin America. Information of areas and yields in Brazil appears in the following table (Table 5).

Table 5: Sugarcane Area, Yields and Production in Brazil 2000-2005

	2000	2001	2002	2003	2004	2005
Area (Million hectares)	4.8	5.0	5.1	5.3	5.6	5.8
Brazil Yield (MT/Ha)	67	70	71	74	74	73
Production (Million MT)	322	350	362	396	416	420

Source: FAOSTAT, 2006

Average productivity in Brazil is 74 Mt/Ha at the end of the period, somewhat greater than the average for all Latin America. The importance of Brazil is preponderant; thus, in 2005, Brazilian output reached 420 million MT or two-thirds of the Latin America total. Sugarcane production in Brazil is more than 10 times the production in Colombia and more than 40 times the production in Peru.

Next, this paper presents sugarcane prices in the main producing countries. The competitive countries have a sugarcane price less than $15/Mt., Brazil had a price of $12.50/Mt in 2000 and Central America had an average price of $15.20 (Sugar Journal, reported in FAO, 2000).

THE INTERNATIONAL MARKET FOR SUGAR

The international sugar market is dominated by the agricultural policies of the United States and the European Union. In the U.S.A., the guarantee prices and producer subsidies are combined with a quota on sugar imports. The result is a domestic price of sugar that is near double the price of the world-wide market. Nevertheless, domestic supply does not exceed internal demand and the country holds an import position.

In order to maintain the price at their objective level, the U.S.A. applies a quota on sugar imports. A special characteristic of the quota is that the rights to sell sugar in the U.S.A. are assigned, for political reasons, to foreign governments, who transfer those rights to their residents. As a result, the rents generated by the sugar quota are credited to foreign producers.

The sugar quota illustrates the tendency of protection to give benefits to a small group of producers, each of whom receives a large benefit, at the expense of a great number of consumers each of whom bears only a small cost. The cost to the North American consumer is only $6 per year. This explains why the average American is not conscious that a quota exists and so there is little opposition to it. On the other hand, the sugar quota is a life-or-death issue for the sugar producers in Louisiana and Hawaii. The industry employs only 12 thousand workers, so that the gains of the producers represent an implicit subsidy of about $90.000 annually per employee. It is not surprising that the sugar producers and their representatives in the Congress of the U.S.A. mobilize themselves as soon as they fear that their interests are affected (Krugman, 1997).

An important result of the subsidized prices and the quotas is that the price of the world-wide market is depressed. That is, the international price would be greater than the present one if these mechanisms of protection in the U.S.A. did not exist. However, the probability that the sugar quota and the subsidies to sugar producers stay in the U.S.A. in the short term is high. Thus, there is no provision for the clearing of these mechanisms in the Free Trade Agreement (FTA) of the U.S.A. with CAFTA (Central American countries) nor in the FTA recently signed with Colombia and Peru. The U.S.A. has made clear that these subjects will be negotiated at the multilateral level in the negotiations of the Doha Round. Consequently, the possibility of a free and ordered trade of sugar between Latin America countries and the U.S.A. does not exist in the short term. As a result, under most foreseeable conditions, producing countries will continue to face depressed prices and excess supply.

The situation described for the segment of the world-wide sugar market dominated by the U.S.A. is repeated for the segment of the market dominated by the policies of the European Union. The depressed scenario of internal subsidies, prices, and restrictions on imports is also reproduced in that segment of the market.

One solution for the sugar industry of Colombia, Thailand, and Peru is its shift to ethanol production, because for this product there are no subsidized prices nor tariffs, quotas, or restrictions to imports.

To measure the degree of competitiveness of the sugar countries, some figures of the production costs in the main sugar producing countries are provided in Table 6. All competitive countries have a cost of sugar inferior to 10 cents a pound. The conclusion is that Colombia is a competitive country in sugar production. Peru does not appear in the list because its costs are above the average of Latin America.

Table 6: Production Cost of Crude Sugar in Selected Countries (1997)

Country	Cost of crude sugar (cents/lb)
Brazil	8.85
Cuba	13.60
Guatemala	9.98
Colombia	9.07
Mexico	14.23
Dominican R.	12.50

Source: GEPLACEA; reported in FAO (2000).

ETHANOL PRODUCTION IN LATIN AMERICA AND ASIA-PACIFIC

A crucial and elementary issue is to investigate which is the most efficient vegetable matter for ethanol production. Although theoretically the alcohol can be produced from grains (maize, sorghum, wheat), from tubers (potatoes), or from sugar cane, technical studies demonstrate that it is more efficient to produce ethanol from sugar cane. The leader in the production of ethanol at a world-wide level is Brazil: its cane production reached 420 million MT in 5.8 million hectares in the year 2005. Of the cane harvest, 60% is destined to ethanol production, and ethanol production has reached 100 million barrels annually. Until today, there has been no sugarcane production for ethanol in Colombia and Peru. Consequently, the costs of a possible production are only estimates made by agricultural technicians.

With the new level of petroleum prices equal to $60 to $70 a barrel, ethanol already is highly competitive as a direct substitute of petroleum. The increase in the petroleum price has already meant an increase in the ethanol price to over $100 a barrel in the year 2005. The costs and benefits of a typical plant for ethanol production are described next. The data apply to a small pilot plant in Peru that will produce 188 barrels of ethanol a day (Torres-Zorrilla, 2004). Regarding benefits or income, for project evaluation purposes, a price of $100 a barrel is assumed. A use of 80% of the installed capacity and therefore a value of the annual sales of $5.5 million it is also assumed (see Table 7 below).

Table 7: Pilot Plant for Ethanol Production: Capacity and Output

Concept	Value
Installed Capacity (Thousand Barrels)	68.6
Use Level of Installed Capacity	80%
Annual Production (Thousand Barrels)	54.9
Value of Sales (Million $)	5.5

Source: Torres-Zorrilla, 2004

The production costs assume a price of sugarcane equal to the international price of 13.20 $/Mt and a transformation ratio of 2.55 MT of sugarcane for one ethanol barrel (alcohol content equal to 6.2%).

Therefore, the cost of the raw material is $33.7 for an ethanol barrel. The cost of manufacture in the plant pilot is equal to $5.14 per ton of processed cane, that is to say, $13.1 for an ethanol barrel. The average cost of the ethanol barrel is equal to $46.8, well below the international price of ethanol (Table 8).

Table 8: Pilot Project of Ethanol: Production Costs

Concepts	Price-Cost ($/Mt)	Amount MT	Values ($)
Raw Material:sugarcane	13.20	2.55	33.70
Cost of manufacturing	5.14	2.55	13.10
Total cost			46.80

Source: Torres-Zorrilla, 2004

The pilot plant produces an annual profit of $2.9 million (sales $5.5 and costs $2.6 million annually). Consequently, the ethanol pilot plant is highly profitable. Although the cost-benefit analysis comes from a case-study for Peru, the results illustrate that ethanol production can be equally or more competitive in Colombia and Thailand.

Finally, a crucial issue is the comparative advantage of ethanol production of Colombia and Peru and Thailand with respect to other countries or other regions like Latin America, Asia, or Africa. The questions that arise are the following: why should re-engineering to ethanol only occur in Colombia and Peru? Why could other countries like Brazil, Cuba, Mexico, Central America, Indonesia or Nigeria not also initiate a re-engineering program to ethanol? The answer to the previous questions is that the fuel market at the present time is incommensurable. If all the sugar producing countries produced ethanol instead of sugar, it would be only sufficient to cover a part of the gasoline market of the United States, whose consumption reaches nearly 10 million barrels per day.

The conclusion is that the possible ethanol competition of Colombia, Peru and Thailand with the production of the rest of the world will be minimal. The fuel market will have, in the future, a magnitude much larger than the combined production of all the developing nations. Moreover, the cost-benefit analysis for ethanol demonstrates an economic feasibility and high rates of return to investments in the production of ethanol. That is, Colombia, and Thailand, and Peru can be competitive in ethanol production.

In the specific case of Peru, this contrasts with the situation in the sugar market where the country is not competitive. The conclusion of the previous analysis was that Peru was not competitive in sugar and its present production was only maintained by the high levels of internal protection and by the greater price of the export quota towards the U.S.A. Peru is not competitive because their costs exceed those of the world-wide market and they can only sell in the subsidized market of the U.S.

POTENTIAL FOR THE SUBSTITUTION OF PETROLEUM IMPORTS

The analysis of the potential for the substitution of petroleum imports should be estimated, in the first instance, at the level of each country separately. The method used here consists of comparing the maximum potential production of ethanol in each country with the physical volume of crude oil imports or the equivalent, if refined fuels are imported. This method is only applied to the sugarcane-producing countries of the sample, that is to say, Colombia, Peru, Thailand, and Malaysia.

The maximum potential production of ethanol in each country is obtained from the sugarcane production in the respective country. First, it is assumed that the historical record of sugarcane production (in metric tons) is what defines the potential production of ethanol. Second, one assumes that all the raw material will be used in the production of the alcohol and that there will be no sugar production. Third, the factor

that is used to consider the maximum physical production of ethanol is a standard level of 6.5% of alcoholic content in the cane. The results of this exercise appear in the following Table 9.

The comparison of the potential ethanol production must be with refined fuel imports, since ethanol directly replaces the gasoline. Alternatively, we estimate that 1.37 barrels of crude petroleum are required to produce 1 barrel or 42 gallons of refined fuels. That is to say, a volume of equivalent refined fuel import can be calculated by dividing the crude petroleum imports by a factor of 1.37 (see Table 9).

The country with the greatest potential to replace crude petroleum imports is Colombia: the maximum production potential of ethanol (2.6 million MT) is much greater than the equivalent in refined fuel imports. This implies that by only diverting 40% of the cane production from sugar to ethanol, Colombia can replace its present crude petroleum imports.

Table 9: Potential of Substitution of Petroleum Imports

Country	Maximum Sugarcane Output	Ethanol Potencial Output	Crude Oil Imports	Equivalent Fuel Imports	Import Substitution Potencial
	Million MT	Million MT	Million MT	Million MT	Percentage
Malaysia	1.6	0.1	8.0	5.8	2%
Thailand	74.3	4.8	32.1	23.4	20%
Colombia	40	2.6	1.5	1.1	236%
Peru	9.7	0.6	6.5	4.7	13%

Source: estimated by author. Note: The ratio between volume of crude petroleum and equivalent volume of gasoline is 1.37. See appendix.

The countries with medium potential to replace crude petroleum imports are Thailand and Peru. In Thailand, if all sugarcane production is dedicated to ethanol extraction (production of sugar equal to zero) 20% of the imports of crude petroleum can be replaced. In Peru, if the total of the sugarcane production is dedicated to ethanol, that is, if the Peruvian sugar production is equal to zero, 13% of the crude petroleum imports can be replaced. In other word if the area of sugarcane production in Thailand is multiplied by five, petroleum imports could be replaced completely. In addition, in Peru, if the area of sugarcane production is multiplied by 7, crude petroleum imports could be almost totally replaced. In both countries, this increase of productive areas seems viable.

The country with a smaller potential for replacing crude petroleum imports is Malaysia: if all sugarcane production is dedicated to ethanol extraction (production of sugar equal to zero) only 2% of the imports of crude oil can be replaced.

The case of Korea in Asia-Pacific is different for two reasons. First, the volume of the import needs is immense; imports of crude oil of Korea represent more than 75% of the combined imports of the three countries of Asia-Pacific in the sample. Second, all the territory of Korea is located north of the 30th parallel of the northern hemisphere: that is to say, it is a territory with a temperate climate not appropriate for sugarcane production. The alternatives to petroleum imports in Korea must be looked for in other agricultural raw materials (maize for example) or in foreign trade with its neighbors (Thailand).

The case of Chile in Latin America is also different for several reasons. First, the import needs of Chile are for two different uses. In Chile crude petroleum for refineries is imported and is of primary importance, but with almost equal importance, gas is imported from Argentina for the generation of electrical energy. This can be seen in the following table that summarizes those two types of imports of Chile (Table 10).

Table 10: Petroleum Imports and Gas Imports of Chile, 2001-2005, Million $

	2001	2002	2003	2004	2005
Petrolean	1727	1615	2126	2875	3779
Gas	862	848	1006	1594	2449
Total	2589	2463	3131	4469	6229

Source: Central Bank of Chile (2006)

Petroleum imports of Chile represented 60% of the total import in 2005. The potential for ethanol is greater as a direct substitute for gasoline for transport vehicles, but the potential of ethanol is smaller as a substitute for gas for electricity generation. In addition, all the territory of Chile is located below the 20th parallel of the southern hemisphere, and thus the climate is not appropriate for sugarcane production. By the previous analysis, the alternatives to petroleum in Chile must be looked for in the foreign trade with their neighbors (Colombia and Peru) or in other agricultural raw materials.

CONCLUSIONS

Petroleum prices and the value of imports have increased dramatically in recent years. The high price of petroleum has caused researchers to reconsider ethanol production. Petroleum imports and the growth of the price of petroleum have a critical and similar importance for the countries of Latin America and Asia-Pacific. This similarity is because both groups of countries have a high dependency on petroleum imports.

This study presents conclusions on the potential to replace petroleum with ethanol in selected countries of Latin America and Asia-Pacific. This potential is calculated for the cane-producing countries. The conclusion is that only Colombia, Peru, Malaysia, and Thailand cultivate the sugarcane; Chile and South Korea do not have significant productions.

Given the existing distortions in the sugar market, a solution for the sugar industry of Colombia, Thailand, and Peru is its conversion to ethanol production, because in this product there are no subsidized prices nor tariffs, quotas, or import restrictions. Another conclusion of this study is that the cost-benefit analysis of ethanol demonstrates an economic feasibility and high rates of return to investments to produce ethanol. That is, Colombia, and Thailand, and Peru can be competitive in ethanol production.

It is demonstrated that the country with the greatest potential to replace crude petroleum imports is Colombia, with a maximum potential production of ethanol that is much greater than the equivalent refined fuel imports. The countries with a medium potential to replace crude petroleum imports are Thailand and Peru. The country with a smaller potential to replace crude petroleum imports is Malaysia.

Korea and Chile do not have potential to replace crude petroleum imports because they are located in temperate regions of the globe. The alternatives to petroleum in Korea and Chile must be looked for in other agricultural raw materials or in foreign trade with their neighbors.

RECOMMENDATIONS ON POLICIES OF COOPERATION

This study proposes a program of cooperation between Latin America and Asia-Pacific on the subject of energy. Our proposal is that a future study must explore the conditions under which a productive, commercial, and financial cooperation on the issue of alternative energies to petroleum could be developed, with special reference to the production and trade of ethanol.

This commercial and financial cooperation must place emphasis in two areas. In the first area, one must investigate the possibility of developing investment projects of Asia-Pacific in Latin America and its potential for the energy sector. Secondly, one must develop strategic lines of cooperation in technology,

especially with respect to technological possibilities of alternative petroleum options. This subject must be reviewed at the level of universities or institutes of applied research. It is also hoped that cooperation will flow from countries of Asia-Pacific towards Latin America.

These instances of cooperation between Latin America and Asia-Pacific should be implemented within the new frame of a world-wide organization for trade and investments, through agreements of economic and commercial complementation between the two groups of countries. The approval of Free Trade Agreements between the U.S.A., the countries of Central America, Chile, and the Andean countries (Colombia and Peru) opens an opportunity to reorganize the markets in the region, especially the markets of sugar and ethanol. These negotiations also create conditions to divert the existing sugarcane plantations towards ethanol production.

The following sections develop the proposals of cooperation between Latin America and Asia-Pacific in the energy sector, which can be made at the level of investment policies or at the level of technological policies.

Among the policies that could help to promote the development of ethanol production in the countries of Latin America, it is important to emphasize the policy of attraction to new direct foreign investment. These investments can occur in new companies or complementary industries in the production chain of ethanol. This objective can also be achieved with direct investments or with joint ventures.

The policies of investment promotion require the active participation of the central and regional governments of the countries. This public support can also be given through physical infrastructure provision (access roads to the ports and the market) and through direct promotion to the establishment of international subsidiaries in the countries of Latin America. For example, the Brazilian company Petrobras could participate in an investment for sugarcane plantations and ethanol refineries in Colombia and Peru. Energy companies of Asia-Pacific could also participate. The organization of road-shows that promote the investment opportunities should be considered.

The development of ethanol production in Latin American countries could be promoted through technological policies. In the first place, the transfer of technology towards regional companies in the countries of Latin America should be considered. A form of support to this process of technology transfer may be the formation of qualified human resources that support the transfer of technology in the future.

The policies of promotion of technological development also require the active participation of the central and regional governments of the countries. This public support may be given through the development of a technological infrastructure via the improvement of technical education and laboratories for research in regional universities (for example, at the University of Trujillo in Peru or the University of Cali in Colombia). There should be a direct policy to promote the sugarcane-producing areas, the raw material for ethanol.

APPENDIX: RELATIONSHIPS BETWEEN CRUDE AND REFINED PETROLEUM

The economic and productive relationships between crude and refined petroleum (gasoline and others) appear in this appendix. Our analysis is limited to gasoline, but it is important to notice that crude oil is also used to produce diesel, kerosene, industrial petroleum and others.

The international prices of crude petroleum and gasoline appear in the following table (Table A1), for the period 1994-2005. The price of gasoline is actually the before-tax average price in the United States, which it is possible to assimilate as the international price.

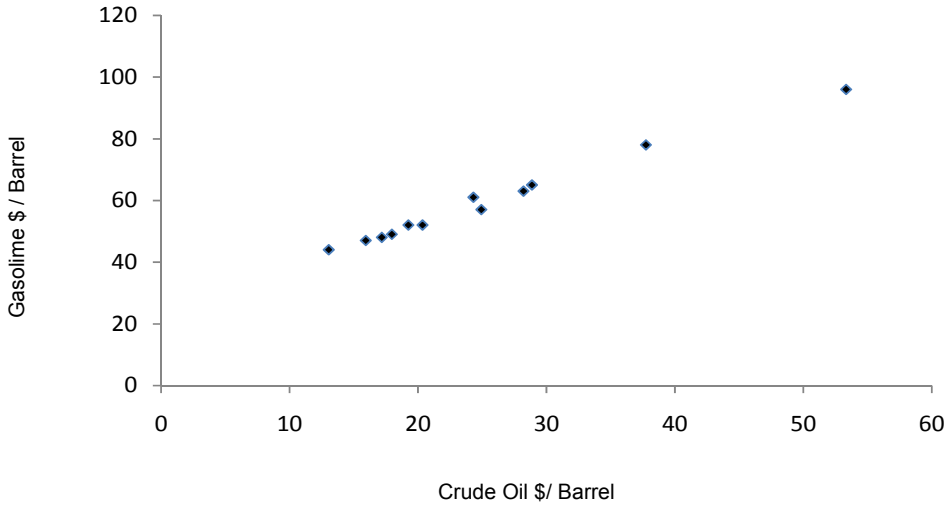
Table A1: International Prices of Crude Petroleum and Gasoline

Year	Petroleum $/barrel	Gasolina Cents/Gallon	Gasoline $/barrel
1994	15.95	112	47
1995	17.20	114	48
1996	20.37	123	52
1997	19.27	123	52
1998	13.07	106	44
1999	17.98	116	49
2000	28.23	150	63
2001	24.33	144	61
2002	24.95	135	57
2003	28.89	155	65
2004	37.76	185	78
2005	53.35	228	96

Sources: Price of Gasoline: EIA, 2006. Price Crude Petroleum: IMF, 2005.

The relationship between the price of the petroleum barrel and the price of the gasoline barrel (42 gallons) is direct and can be appraised in the following figure (Figure 2).

Figure 2: Price of Crude Petroleum and Price of Gasoline



Source: Estimated by author, from data of previous table

To predict the price of gasoline, we use data from 1994-2005. The linear regression for predicting the price of gasoline (dependent variable) from the price of crude petroleum (independent variable) with 12 observations has the following result:

$GAS = \alpha + \beta$ (crude price)

Table A2: Linear Regression for Predicting the Price of the Gasoline from the Price of Crude Petroleum

	Coefficient	t-Statistic
C(1)	25.89273	23.38136***
C(2)	1.328314	32.75528***
R-squared	0.990766	
Adjusted R^2	0,989842	
Log likelihood	-28.85496	

*Source: E-Views Econometric program. Dependent variable is the GAS price and the independent variable is crude price. *** indicates significance at the 1 percent level.*

The interpretation of this regression is that the cost of gasoline has two components: a fixed cost of $25.89 per gasoline barrel and a variable cost that is equal to 1.33 times the price of the barrel of crude oil. Thus, if the price of the petroleum barrel were the price for the year 2000 ($28.20), the price (or cost) of gasoline would be $63.40 a barrel or $1.50 a gallon.

In order to find a physical relation between the crude petroleum that is required to produce a gasoline barrel, the input-output model (Leontief, 1966) has been used. According to the Leontief model, the input-output coefficient between two industries (input i, output j) is equal to the following equation:

$$a_{ij} = \frac{\alpha_{ij}}{p_j} \times p_i$$

Where: a_{ij} is the input-output coefficient, α_{ij} is the physical coefficient (how many barrels of crude are required by a gasoline barrel), p_i is the price of input of crude petroleum; and p_j is the price of the final product: gasoline. From the previous equation the price of gasoline is written as a function of the input price of crude petroleum. This is the basic model of determination of the gasoline-price that is to be used in this study.

$$p_j = \frac{\alpha_{ij}}{a_{ij}} \times p_i = \beta \times p_i$$

The basic model interprets that the gasoline-price is a direct function of the crude oil-price multiplied by a factor β. This second equation can be estimated by econometric methods using the data from table A1. Note that the estimation must be a linear equation without a constant term.

For this analysis, the input-output coefficient from the input-output table of the economy of U.S.A. for 1997 has been used, which is equal to 0.526. The input-output table of the American economy is the most recent matrix estimated by the Bureau of Economic Analysis (2006). With this value, it is interpreted that 53% of the production cost of gasoline is the cost of crude petroleum.

The direct estimation of the model gives as a result the following equation where the number of observations is again 12 and the resulting R^2 is 0.486:

Table A3: Estimation of the Price Model of Gasoline

	Coefficient	t-Statistic
C(1)	2.200261	20.92***
R-squared	0.485932	
Adjusted R^2	0.485932	
Log likelihood	-44.97148	

Source: E-Views Econometric program

The result is that the model is $p_j = 2.2\ p_i$. That is, the price of the refined gasoline barrel is equal to 220% of the price of the crude oil used.

The estimated equation has, nevertheless, some limitations: The R^2 coefficient of the estimation is relatively low (48%) and the Durbin-Watson statistic reflects a high auto-correlation of the residuals of the equation.

In fact, some authors argue that although a clear relation between the output price and the input price always exists, sometimes this relation occurs with a certain statistical lag. That is, the price of gasoline may be reflecting the expectations of the agents about such an important price as the price of petroleum.

Often, the oil refineries are state-owned and they base their production costs of gasoline on the imported oil price of the previous shipment. If the oil price increases, it is clear that this attitude is unsuitable and that the input always must reflect its opportunity cost. The usual behavior is, however, to freeze the price of gasoline for political reasons, in the expectation that oil prices will return to previous levels.

By this argument, the model of the previous equation can be reframed as follows:

$$p_j = \beta \times p_{i,t-1}$$

Where the subscript (t-1) indicates that the price of crude oil is the price of the previous period. This re-estimation appears in the following table. The result is that the new model is $p_j = 2.61\ p_i$. That is, the price of the refined gasoline barrel is equal to 261% of the price of crude oil used.

The re-estimated equation corrects the limitations of the previous equation. First, the R^2 coefficient is greater, equaling 65%. Second, the Durbin-Watson statistic, 1.785 is at an acceptable level indicating that there are no auto-correlation problems. After controlling for the endpoints, the number of observations in this analysis is 11.

Table A4: Re-Estimation of the Price Model of Gasoline

	Coefficient	t-Statistic
C(1)	2.609365	22.67639
R-squared	0.648837	
Adjusted R^2	0,648837	
Log likelihood	-39.24018	

Source: E-Views Econometric program

Finally, we remember that the Beta coefficient of this new equation (equal to 2.61) is the ratio between the physical coefficient and the monetary input-output coefficient. Since the input-output coefficient for our period of analysis is 0.526 (from the input-output table), the physical coefficient is that we require 1.37 barrels of crude oil to produce a refined gasoline barrel. This is the ratio that was used to calculate the potential for ethanol to replace imports of crude oil in the four countries of Latin America and Asia-Pacific.

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FINANCIAL DECISIONS AND TAX SHIELDS

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ABSTRACT

This paper addresses two questions related to tax shields. Firstly, what is the real moment of tax shield realization? Secondly, what influence shall the real tax shield realization moment have on tax shield present value? The real moment of tax shield realization is defined at the moment when the tax shield is reflected in the taxpayer's cash flow, in the form of income tax reconciliation and paid tax deposits. Subsequently, authors have investigated the dependence of tax shield present value on the discount rate, and on the size of a time span between the moment of tax-shield claim origination and tax-period's end. The largest difference between basic value of the tax shield and its present value was found at the maximum discount rate considered in the model, and at the maximum size of the time span between the moment of tax-shield claim origination and tax-period's end. The dependence was not always linear. In conclusion modifications of financial models that employ tax shields are suggested. These modifications are based on including coefficients reflecting the real moment of tax shield realization.

INTRODUCTION

Taxes are not merely a financial managers's "nightmare", but they mainly represent an important factor influencing most financial decisions, primarily through tax wedges and shields. While tax wedges diminish investor returns (Holeckova, 2002), tax shields mitigate the impact of certain decisions on financial performance (Marek, Radova, 2002). Tax shield can be regarded as a sum of money the tax liability is reduced by, due to the occurrence of a transaction that decreases the company's tax base, or entitles to tax relief. The transaction can be understood as posting of tax deductible costs and expenses in taxpayer's accounts, or occurrence of a different matter resulting in tax liability alteration, e.g. acquisition of fixed assets.

Mainstream finance has recently turned away from highly abstract theories in favour of detailed models of actual functioning of real world. In this world, tax shields play an irreplaceable role – they alter capital budgeting decisions, influence capital structure, etc. All classic models of finance (see e.g. Copeland & Weston, 1988) assume that the real moment of tax shield realization is identical to the moment the tax-deductible expense is incurred. However, this does not correspond to the real world. In our contribution, we aim to elaborate the tax shield issue in the suggested direction, under conditions of the Czech Republic tax law, and subsequently apply obtained findings through adjustments of financial models. In our discussion, we shall seek the answers to the following questions:

1. What is the real moment of tax shield realization?
2. What influence shall the real tax shield realization moment have on tax shield present value?

In various countries more or less different tax and deposit settlement systems are applied. For the purpose of the paper we shall consider only one settlement system, the present system adopted in the Czech Republic. We shall abstract from the differences in other countries tax settlement systems that may influence the real moment of tax shield realization and may lead to different financial decisions.

WHAT IS THE REAL MOMENT OF TAX SHIELD REALIZATION?

Cash flow based financial models must logically reflect the real tax shield realization in company's cash flows at the time of real execution of a relevant tax payment into state budget. For illustration, a tax-deductible payment incurred anytime in 2007 is not be reflected in tax payments into state budget until the 2007 income tax is settled, i.e. by 31st March of the next consecutive year (2008 in our example), or by 30th June 2008 in case of taxpayers who are liable for annual financial statements audits, or whose tax assessments are elaborated and presented by tax advisors. Decreased tax bases subsequently affect the amount of income tax deposits paid in the next consecutive tax deposit period. Consequently, the difference between tax deposits paid and real income-tax liability for the relevant period shall equal the amount the reduction in tax deposits payments.

For the sake of simplicity, we assume the tax shield claim originates at the same time as realization of this payment, or execution of this payment shall sooner or later lead to origination of the claim, for example, based on incurrence of tax-deductible costs and expenses.

Illustrative example:

01. 9.2007 … tax-deductible payment at amount of 1,000 (payment A);
30. 6.2008 … tax balance reconciliation date – difference paid for 2007 is decreased by the tax shield, i.e. 1,000 × 0.24 = 240 (payment B);
15. 9.2008 … income tax deposit payment decreased by ¼ of tax shield originated in 2007, i.e. 240 / 4 = 70 (payment C);
15.12.2008 … income tax deposit payment decreased by ¼ of tax shield originated in 2007, i.e. 240 / 4 = 70 (payment D);
15. 3.2009 … income tax deposit payment decreased by ¼ of tax shield originated in 2007, i.e. 240 / 4 = 70 (payment E);
15. 6.2009 … income tax deposit payment decreased by ¼ of tax shield originated in 2007, i.e. 240 / 4 = 70 (payment F);
30. 6.2009 … tax balance reconciliation date – difference paid for 2008 is increased by the equal amount the tax deposits paid in 2006 were reduced by, i.e. 60 × 2 = 140 (payment G);
30. 6.2010 … tax balance reconciliation date – difference paid for 2009 is increased by the equal amount the tax deposits paid in 2007 were reduced by, i.e. 60 × 2 = 140 (payment H).

WHAT INFLUENCE SHALL THE REAL TAX SHIELD REALIZATION MOMENT HAVE ON PRESENT VALUE OF TAX SHIELD?

This paper focused primarily on the present value of tax shield calculation methodology. The calculation procedure can be viewed in the following illustration depicted in Table 1.

This illustrative example assumes that a) the investor uses the services of a tax advisor and exploits the opportunity of tax assessment submission by end of June of the next consecutive year, b) the tax period is calendar year, c) the income tax rate is equal 24%, and d) the last known tax liability of the taxpayer exceeded 150.000 CZK. Here we shall add two additional assumptions: the interest is compounded on monthly basis and the fixed monthly discount rate is 1% (i.e. annual discount rate of 12%).

Table 1: Present Value of Tax Shield – Illustrative Example

Date	Payment	Number of Months	Original Payment	Tax Shield	Present Value of Tax Shield	
1. 9.2007	A	0	–1 000			
30. 6.2008	B	10		+240	$+240/(1+0.01)^{10}=$	**+217.27**
15. 9.2008	C	12		+60	$+60/(1+0.01/2)/(1+0.01)^{12}=$	**+52.98**
15.12.2008	D	15		+60	$+60/(1+0.01/2)/(1+0.01)^{15}=$	**+51.42**
15. 3.2009	E	18		+60	$+60/(1+0.01/2)/(1+0.01)^{18}=$	**+49.91**
15. 6.2009	F	21		+60	$+60/(1+0.01/2)/(1+0.01)^{21}=$	**+48.44**
30. 6.2009	G	22		–120	$-120/(1+0.01)^{22}=$	**–96.41**
30. 6.2010	H	34		–120	$-120/(1+0.01)^{34}=$	**–85.56**
Total	**X**	**X**	**–1 000**	**+240**		**+238.07**

Basic Value of Tax Shield

To determine the basic value of the tax shield, we consider the total (but not discounted) cash amount. The tax liability can be decreased by the basic value of the tax shield. In case of tax-deductible payment, or other transactions entitling the company to claim income tax base reduction, the basic value of the tax shield is calculated as a product of the value of the income tax-base reducing item and the income tax rate:

$$TS = TBRI \times t, \tag{1}$$

where TS = basic value of tax shield,
$TBRI$ = value of the income tax-base reducing item,
t = income tax rate.

If the tax liability decrease is claimed on the basis of entitled income-tax relief, the basic value of the tax shield equals the relief value:

$$TS = relief, \tag{2}$$

where $relief$ = value of income-tax relief.

Present Value of Tax Shield

Next we focus on calculation of the present value of the tax shield. The independent variables are the monthly discount rate i_m, and number of months from the moment of tax shield claim origination till the end of first tax period n. Other parameters reflect the model's assumptions suggested in the following illustrative example.

$$PV(TS) = TS \times \left\{ \frac{1}{(1+i_m)^{n+6}} + \frac{1}{4 \times (1+\frac{i_m}{2})} \times \left(\begin{array}{l} \frac{1}{(1+i_m)^{n+8}} \\ + \frac{1}{(1+i_m)^{n+11}} \\ + \frac{1}{(1+i_m)^{n+14}} \\ + \frac{1}{(1+i_m)^{n+17}} \end{array} \right) - \frac{1}{2} \times \left(\begin{array}{l} \frac{1}{(1+i_m)^{n+18}} \\ + \frac{1}{(1+i_m)^{n+30}} \end{array} \right) \right\}, \qquad (3)$$

where $PV(TS)$ = present value of tax shield,
n = number of months from the moment of tax shield claim origination till the end of tax period,
i_m = monthly discount rate,
= i / 12,
i = annual discount rate.

A Note on Discount Rates

The issue of discount rate determination is not addressed in our article. In fact, its precise determination is not possible from a theoretical perspective because determination of the discount rate depends on the purpose of the financial model, and varies with each individual investor's expectations. However in this research after-tax cash flows shall be discounted by a tax-adjusted discount rate. Financial models reflecting tax shields do employ after-tax cash flows.

DEPENDENCE OF TAX SHIELD ON DISCOUNT RATE

Next, we investigate the dependence of $PV(TS)$ and discount rate. Figure 1 shows dependence between $PV(TS)$ and the discount rate. Individually plotted curves represent the present value of the tax shield for selected number of months between the moment of tax shield claim origination and the end of the tax period (i.e. in our case till the end of calendar year). We define this difference in time periods as the "tax shield realization span." Curve [*12*] demonstrates the dependence of $PV(TS)$ on the discount rate when the tax shield claim originates on 1st January of respective year, i.e. 12 months prior to the tax-period's end. Similarly, e.g. curve [*0*] represents the dependence when the tax shield claim originates at the year (thus, tax period) end. All curves plotted can be characterized by a quadratic equation in common form: $Cx^2 + 2Dy + 2Ex + F = 0$, where the coefficient C is lower the longer the tax shield realization span. Therefore, we can state that a tax shield claim that originates at the tax period's beginning can be approximated by a linear function. Such situation is demonstrated by curve [*12*].

In addition, we also note that a curve extreme (maximum) can be found for each curve representing a different time span remaining to tax period's end and characterized by parabolic function, with the maximum located at individual parabolas' vertexes. Such a maximum represents the largest $PV(TS)$, and each of the discussed functions is maximized at a different level of discount rate. The closer the tax-shield claim origination is to the tax-period's end, the higher the parabola-maximizing discount rate.

Figure 1: Dependence of Present Value of Tax Shield on Discount Rate

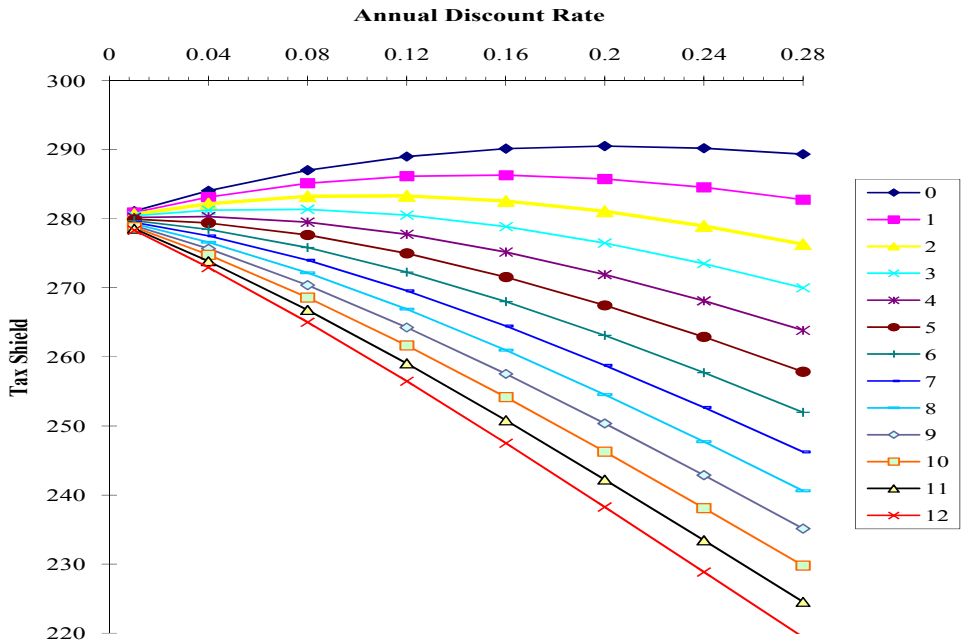
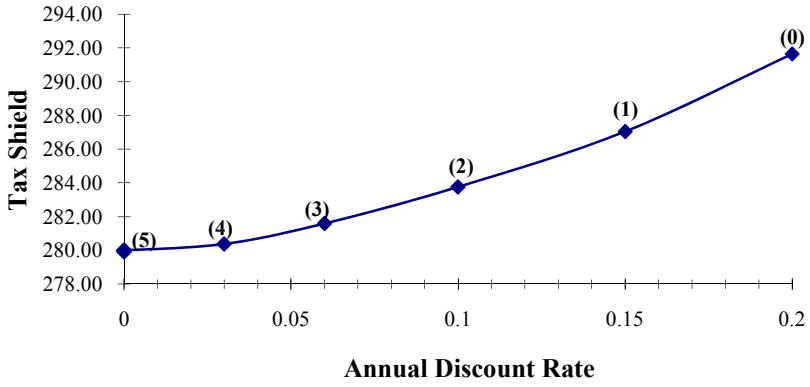


Figure 2 shows the relationship between the maximum present value of the tax shield and the discount rate. Numbers in brackets above the individual plotted points mark the number of months from the origination of tax shield claim till tax period's end.

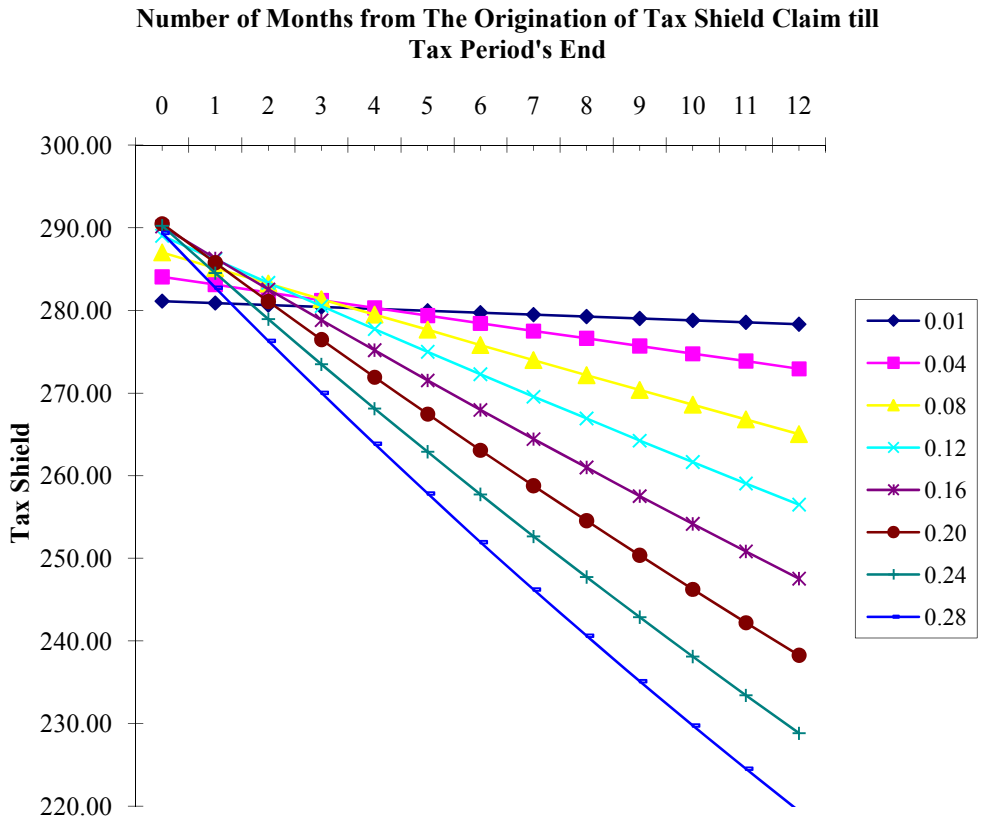
Figure 2 Maximum Present Value of Tax Shield in Dependence on Discount Rate



Relationship between the Present Value of the Tax Shield and the Tax Shield Realization Span

The dependence between *PV*(*TS*) and the tax shield realization span is explored in this section. The relationship is depicted in Figure 3 for various discount rates.

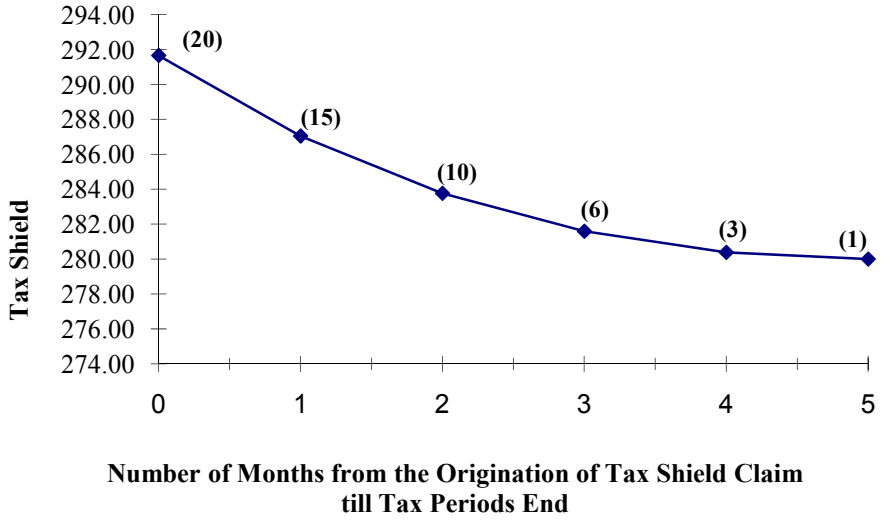
Figure 3: Dependence of Tax Shield Present Value on the Moment of Tax Shield Claim Origination



From the figure, it is noted that the relationship is linear for any selected discount rate. The largest *PV*(*TS*) logically occurs with the minimal tax shield realization span, i.e. when the claim is realized on the last day of tax period (in our case on 31st December). At this point, the *PV*(*TS*) is paradoxically even larger than the basic value. This paradox is, however, merely ostensible. This result is caused by the existence of income tax deposits, and by discounting of individual tax payments. With increasing time spans, the *PV*(*TS*) declines, to a minimum at 12 months prior to tax-period's end, i.e. on 1st January in our case.

The intersection of lines representing *PV*(*TS*) for various discount rates is an interesting graphical finding. In this case, the tax-shield claim origination moment falls on the last day of tax period and the maximum *PV*(*TS*) is reached for a discount rate of 20 %. Conversely, should the tax shield claim originate 12 months prior to tax-period's end, the maximum *PV*(*TS*) is reached for the lowest discount rate (in our illustration for 1 % annual discount rate). In other words, as depicted in Figure 4 for any discount rate we are able to find a time span between the moment of tax-shield claim origination and tax-period's end, such that the present value of tax shield is at a maximum. Numbers in brackets in the figure mark discount rates, which maximize the tax shield present value.

Figure 4: Maximum Present Value of Tax Shield in Dependence on the Moment of Tax Shield Claim Origination



COEFFICIENTS OF PRESENT VALUE OF TAX SHIELD

With respect to the presented research, it is clear that the present and basic value of the tax shield can differ. However, the question of whether the difference is significant enough to necessitate adjustments financial models remains open. That is, if the difference is large enough to necessitate use of the present rather then basic value. We introduce a function $\alpha(i;n)$ produces an absolute deviation of the difference between TS and $PV(TS)$ as a percentage of the basic tax shield value TS for a given discount rate i, and a given tax shield realization span n.

$$\alpha(i;n) = \frac{|TS - PV(TS)|}{TS} \times 100, \qquad (4)$$

where $\alpha(i;n)$ = absolute value of a deviation between the present and basic value of tax shield.

Figure 5 shows a map of the function's values $\alpha(i;n)$ for various discount rates i, and various time spans, n, For the sake of clarity, we have used discount rates up to 24 % even though such rates are unrealistic in current economic conditions.

It follows from the figure and the following Table 2 that the deviation between the present and basic value of the tax shield does not represent more than 2.5 % of the basic value in most cases. With an annual discount rate between 0.01 and 0.12 approximately 71.15 % of all cases do not exceed the 2.5% level. In the interval of 0.01 to 0.12 deviations exceeding 10 % do not occur at all, and in the interval of 0.01 to 0.24 only in 10.9 % of all cases exceed the 2.5% level. The largest deviations occur in cases when tax shield claims originate at the tax-period's beginning. In cases when the claims originate at the tax-period's end, the deviation values are rather negligible.

Figure 5: Function *α(i;n)* Value Map

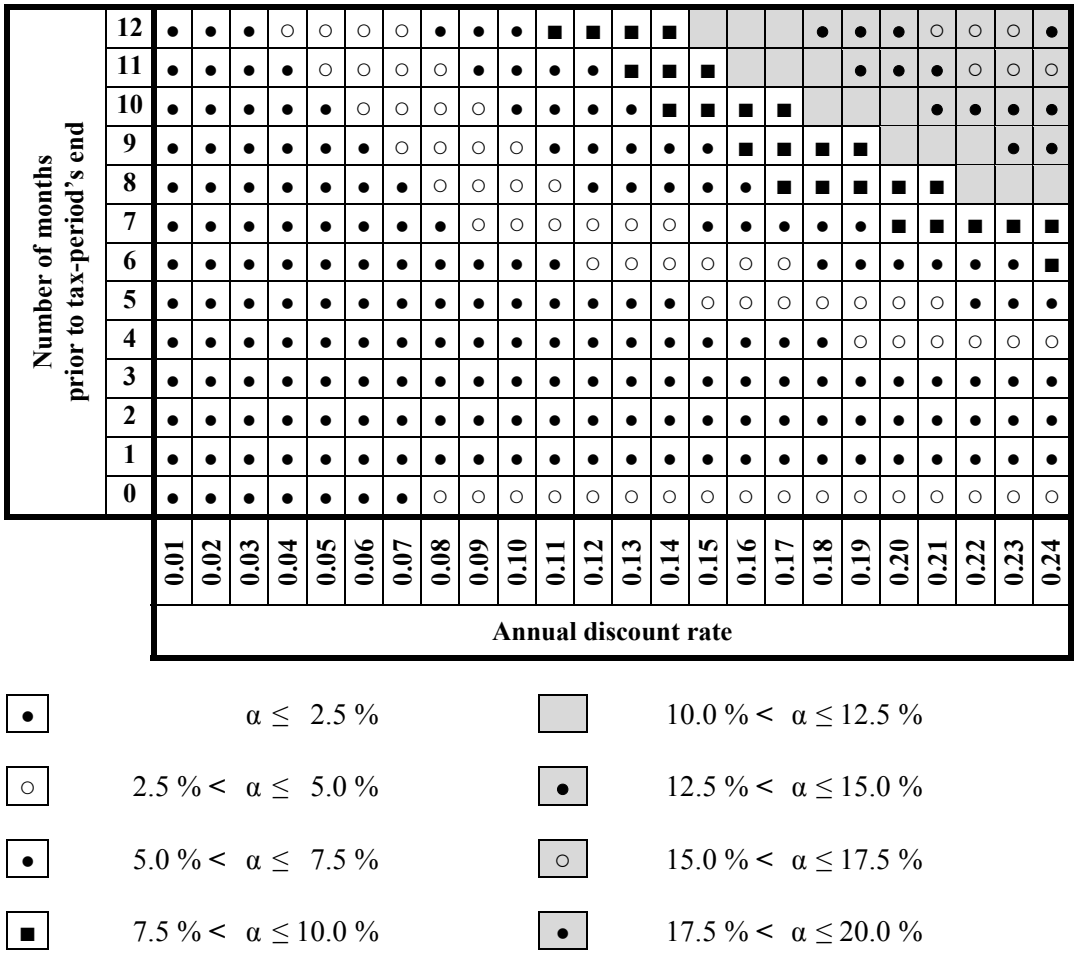


Table 2: Function Value Frequency *α*(*i*;*n*)

Discount ate	Frequency	α ≤ 2.5 %	> 2.5 % α ≤ 5.0 %	> 5.0 % α ≤ 7.5 %	> 7.5 % A ≤ 10.0 %	> 10.0 % α ≤ 12.5 %	> 12.5 % α ≤ 15.0 %	> 15.0 % α ≤ 17.5 %	> 17.5 % α ≤ 20.0 %	Σ
up to 0.24	absolute	155	62	35	26	15	12	6	1	312
	relative	49.7	19.9	11.2	8.3	4.8	3.9	1.9	0.3	100.0
up to 0.12	absolute	111	30	13	2	–	–	–	–	156
	relative	71.2	19.2	8.3	1.3	–	–	–	–	100.0

The question of when the deviations should be considered significant remains. The answer is rather straightforward and intuitive. The deviation is significant enough only when substitution of basic tax shield value with its present value leads to alteration in investment choice, or modification of other financial or capital decision. Thus, the critical deviation is case specific. The critical values can be determined by applied decision-making criteria for various investment alternatives.

Originally, we tested the present value of tax shield in a lease vs. buy analysis. According to our results in most of cases the differences were not significant. However, there were some significant cases. As a certain guideline on whether it is necessary to use the present tax shield value instead of the basic one, we might use the map of function values $\alpha(i;n)$ depicted in Figure 5. Based on this approach, we recommend using the present value of the tax shield in all cases where one can rationally expect that the value difference affects the relevant decision. For simplicity we can use the coefficients of the tax shield present value $k_{TS}(i;n)$:

$$k_{TS}(i;n) = \frac{PV(TS)}{TS}, \text{ or } PV(TS) = TS \times k_{TS}(i;n), \quad (5)$$

where $k_{TS}(i;n)$ = coefficient of present value of tax shield.

In Table 3, coefficients $k_{TS}(i;n)$ for various discount rates i, and for various number of months from the origination of tax shield claim till tax period's end n are presented

Table 3: Coefficients of Present Value of Tax Shield $K_{ts}(i;n)$

		n												
i	**i_m**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
0.01	**0.00083**	1.0040	1.0032	1.0024	1.0015	1.0007	0.9999	0.9990	0.9982	0.9974	0.9965	0.9957	0.9949	0.9940
0.02	**0.00167**	1.0078	1.0061	1.0044	1.0028	1.0011	0.9994	0.9978	0.9961	0.9945	0.9928	0.9911	0.9895	0.9878
0.03	**0.00250**	1.0113	1.0088	1.0062	1.0037	1.0012	0.9987	0.9962	0.9938	0.9913	0.9888	0.9863	0.9839	0.9814
0.04	**0.00333**	1.0145	1.0112	1.0078	1.0044	1.0011	0.9978	0.9945	0.9912	0.9879	0.9846	0.9813	0.9781	0.9748
0.05	**0.00417**	1.0175	1.0133	1.0091	1.0049	1.0007	0.9966	0.9925	0.9883	0.9842	0.9802	0.9761	0.9720	0.9680
0.06	**0.00500**	1.0203	1.0152	1.0102	1.0051	1.0001	0.9952	0.9902	0.9853	0.9804	0.9755	0.9706	0.9658	0.9610
0.07	**0.00583**	1.0228	1.0169	1.0110	1.0051	0.9993	0.9935	0.9877	0.9820	0.9763	0.9706	0.9650	0.9594	0.9539
0.08	**0.00667**	1.0251	1.0183	1.0116	1.0049	0.9982	0.9916	0.9850	0.9785	0.9720	0.9656	0.9592	0.9529	0.9465
0.09	**0.00750**	1.0272	1.0196	1.0120	1.0044	0.9970	0.9895	0.9822	0.9749	0.9676	0.9604	0.9532	0.9461	0.9391
0.10	**0.00833**	1.0291	1.0206	1.0121	1.0038	0.9955	0.9872	0.9791	0.9710	0.9630	0.9550	0.9471	0.9393	0.9315
0.11	**0.00917**	1.0307	1.0214	1.0121	1.0029	0.9938	0.9848	0.9758	0.9670	0.9582	0.9495	0.9409	0.9323	0.9238
0.12	**0.01000**	1.0322	1.0220	1.0119	1.0019	0.9919	0.9821	0.9724	0.9628	0.9532	0.9438	0.9345	0.9252	0.9160
0.13	**0.01083**	1.0335	1.0224	1.0115	1.0006	0.9899	0.9793	0.9688	0.9584	0.9481	0.9380	0.9279	0.9180	0.9081
0.14	**0.01167**	1.0346	1.0227	1.0109	0.9992	0.9877	0.9763	0.9650	0.9539	0.9429	0.9320	0.9213	0.9107	0.9002
0.15	**0.01250**	1.0355	1.0227	1.0101	0.9976	0.9853	0.9731	0.9611	0.9493	0.9375	0.9260	0.9145	0.9033	0.8921
0.16	**0.01333**	1.0363	1.0226	1.0092	0.9959	0.9828	0.9698	0.9571	0.9445	0.9321	0.9198	0.9077	0.8958	0.8840
0.17	**0.01417**	1.0368	1.0223	1.0081	0.9940	0.9801	0.9664	0.9529	0.9396	0.9265	0.9135	0.9008	0.8882	0.8758
0.18	**0.01500**	1.0372	1.0219	1.0068	0.9919	0.9773	0.9628	0.9486	0.9346	0.9208	0.9072	0.8938	0.8805	0.8675
0.19	**0.01583**	1.0375	1.0213	1.0054	0.9897	0.9743	0.9591	0.9442	0.9295	0.9150	0.9007	0.8867	0.8728	0.8592
0.20	**0.01667**	1.0376	1.0206	1.0038	0.9874	0.9712	0.9553	0.9396	0.9242	0.9091	0.8942	0.8795	0.8651	0.8509
0.21	**0.01750**	1.0375	1.0197	1.0022	0.9849	0.9680	0.9513	0.9350	0.9189	0.9031	0.8876	0.8723	0.8573	0.8425
0.22	**0.01833**	1.0374	1.0187	1.0003	0.9823	0.9646	0.9473	0.9302	0.9135	0.8970	0.8809	0.8650	0.8494	0.8342
0.23	**0.01917**	1.0370	1.0175	0.9984	0.9796	0.9612	0.9431	0.9254	0.9080	0.8909	0.8741	0.8577	0.8416	0.8257
0.24	**0.02000**	1.0366	1.0162	0.9963	0.9768	0.9576	0.9388	0.9204	0.9024	0.8847	0.8673	0.8503	0.8337	0.8173

TAX RATE IRRELEVANCY

In the previous discussion we introduced function $\alpha(i;n)$ to be an absolute difference between the initial and present value as a percentage of the initial value for given discount rate i and for given tax shield realization span, n. Now we analyze effects of different income tax rate levels on the results. It follows from relationship (1) that the basic value is in direct proportion to income tax rate. Rearranging the formula (4) for absolute difference between the basic and present value of tax shields we obtain:

$$\alpha(i;n) = \frac{|TS - PV(TS)|}{TS} \times 100 = \frac{TS|1-y|}{TS} = \frac{TBRI \times t|1-y|}{TBRI \times t} = \frac{TBRI|1-y|}{TBRI}, \quad (6)$$

where:

$$y = \frac{1}{(1+i_m)^{n+6}} + \frac{1}{4 \times (1+\frac{i_m}{2})} \times \left(\begin{array}{l} \frac{1}{(1+i_m)^{n+8}} + \frac{1}{(1+i_m)^{n+11}} \\ + \frac{1}{(1+i_m)^{n+14}} + \frac{1}{(1+i_m)^{n+17}} \end{array} \right) - \frac{1}{2} \times \left(\begin{array}{l} \frac{1}{(1+i_m)^{n+18}} \\ + \frac{1}{(1+i_m)^{n+30}} \end{array} \right). \quad (7)$$

It is obvious that the difference between the basic and present value of tax shields is independent of the income tax rate level. Adopting analogical procedure and mathematical adjustments the coefficient is also independent of the level of income tax.

CONCLUSIONS

In this paper we examine the relationship between the basic value of a tax shield and its present value. We discuss the importance of the issue and computations showing the economic significance of the difference. We argue that the present value of the tax shield should be used in managerial decision making. The findings of the paper can be summarized as follows:

The real moment of tax shield realization is the moment, when the tax shield is reflected in taxpayer's cash flows in form of tax payment. In relation to time span between the tax shield claim origination and tax period's end, holding other variables equal, the maximum present value of the tax shield PV(TS) is reached when the claim originates at the end of tax period. Extending the time span the tax shield decreases the present value.

Ceteris paribus, the maximal present value of tax shield PV(TS) is located at the parabola vertex, i.e. the tax shield present value grows until a certain level of discount rate is reached; after reaching this level the present value decreases. In most of the cases, the absolute value of the deviation between the present and basic value of the tax shield α(i;n) does not exceed 2.5 % of the basic value at reasonable discount rate levels. The maximum deviation is reached with the longest possible time span between the tax shield claim origination and tax period's end, i.e. 12 months.

We recommend using the present value of the tax shield instead of the basic value in all cases where we can expect that the difference in values would influence a financial decision. For simplicity, coefficients of present value of tax shield kTS(i;n) can be used as a measure of the difference in values.

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