Accounting & Taxation

VOLUME 4 **NUMBER 1** **2012**

CONTENTS

COUNTRY VERSUS INDUSTRY EFFECT ON BOARD STRUCTURES

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ABSTRACT

We examine the board structures of US and Indian firms in two industries. We examine three aspects of board structures: board size, board independence, and board leadership. The two industries selected for analysis are information technology and capital goods. While Indian information technology firms have close ties to the American economy, capital goods firms have a domestic focus. Thus, we are able to analyze differences in board structures of firms in two countries and two industries, one of which is closely related and the other relatively unrelated. We do not find any significant differences in board size and board leadership for US and Indian firms in either industry. However, we find that US boards are more independent than Indian firms, both for information technology firms and capital goods firms. These findings are more supportive of the country effect than for the industry effect on board structures.

JEL: F23; G34; N20

KEYWORDS: Board of Directors, Corporate Governance, and Board Composition.

INTRODUCTION

In a survey paper, Adams, Hermalin, and Weisbach (2010) state that "The two questions most asked about boards are: "What determines their makeup and what determines their actions?" This study contributes to the literature by examining factors relating to the first issue, i.e., factors affecting board structures. We study this issue in a cross-country setting and compare board structures of US and Indian firms in two different industries: information technology and capital goods. We examine the three variables of 'the number of directors,' 'the percentage of independent directors,' and 'the CEO also holding the chairperson position' to compare board size, board independence, and board leadership respectively.

While the Indian information technology industry is closely related to the American economy, Indian capital goods firms operate with a domestic focus. Thus, we are able to examine differences in board structures across two countries and two industries where the industries are related at different levels between the two countries.

If the country effect is more dominant in shaping boards then we expect to find differences in board structures of US and Indian firms irrespective of industry affiliation. However, if the industry effect is more dominant then we expect to find similar board structures for US firms and Indian technology firms, but not for US firms and Indian capital goods firms.

Our findings are supportive of the country effect being the more dominant force in shaping board structures. While we find that US firms and Indian firms are similar in board size and board leadership structures, we also find that Indian firms are less independent than US firms. This finding is true for both technology and capital goods firms.

The rest of paper is organized as follows: section 2 discusses the earlier literature, section 3 describes the data and methodology; section 4 provides a discussion of the results, and section 5 presents the conclusions.

LITERATURE REVIEW

As stated earlier, the literature on boards can be broadly classified under two categories: determinants of board characteristics, and, the relation between board characteristics and board performance. Adams, Hermalin and Weisbach (2010) provide a comprehensive review of literature related to the board of directors. While several board characteristics have been studied, three characteristics are considered to be the most important: board size, board independence, and board leadership.

Board size refers to the number of directors on the board. A larger board can provide bigger and more diverse talent pool, especially in a complex business environment (Coles, Daniel and Naveen, 2008). However, it can also introduce the free rider problem as well as bureaucratic problems. A free rider problem refers to the fact that if there are too many people involved in the process, there may be incentives for an individual member to avoid investing time and effort in collecting information and monitoring management. Yermack (1996) who studies domestic firms and Eisenberg, and Sundgren and Wells (1998) who study foreign firms find that firms with smaller boards are valued more highly. Their findings suggest that smaller boards are more efficient.

Board of directors is a body that supervises management on behalf of shareholders. It is imperative for them to be objective in assessing management and in their other roles. To be objective, it is important that they are not only capable but also independent of management's influence. Thus, independent boards can be expected to be more efficient. On the other side, board members who are not well informed about the business may not be as useful as people close to the business. Thus a debate has been going for some time, and over time a consensus is evolving that independence is a preferable board characteristic. The empirical evidence, however, is not very conclusive. Rosenstein and Wyatt (1990) find a statistically significant positive market reaction to addition of an outside director, Weisbach (1988) finds that board independence affects the decision to remove top management based on past performance. Borokhovich, Parrino and Trapani (1996) find that more independent boards are more likely to appoint an outsider as CEO. On the other hand, Hermalin and Weisbach (1991) and Bhagat and Black (2001) find no significant relationship between board independence and firm value.

Board leadership relates to whether the CEO of a firm also holds the position of the chair of the board or not. As stated earlier, one of the most important roles of boards is to supervise the management team led by the CEO. A board that is led by a chairman who is also the CEO creates a potential conflict of interest. For example, Goyal and Park (2002) find that CEO turnover based on performance is affected by board leadership structure. On the other hand, opponents of the separation of leadership issue (for example, Brickley, Coles and Jarrell, 1997) argue that there are potential costs in separating the two posts. Linck, Netter and Yang (2008) argue that the choice of a combined position is affected by the complexity of business and information asymmetry.

While there are studies that examine the effect of board structures on firm performance in an international setting (Ghosh, 2006), there seems to be a gap in the literature which relates to the impact of the home country of a firm and the impact of the industrial sector in which the firm operates on the firm's board size, board independence, and board leadership. This study attempts to fill that gap.

DATA AND METHODOLOGY

Our sample includes firms from two industries: information technology and capital goods. We select ten US firms and ten Indian firms in each of the two industries. In total, we use 40 firms in our analysis. We select the largest firms in each industry. We use Google Finance to identify the largest US firms in these two industries. For Indian firms, we use the BSE capital good index and the BSE Tech Index to identify the largest Indian firms. Information about these two indices is obtained from www.Moneycontrol.com.

Table 1 provides a list of 40 firms and their financial variables with Panel A reporting results for technology firms and Panel B reporting results for capital goods. We report total assets, sales, and net income for the financial year ending 2008 or 2009. All financial information is sourced from latest annual reports we find on the firms' websites. US firms' figures are reported in US dollars and Indian firms' figures are reported in Indian Rupees. On December 8, 2009 the value of one dollar is equivalent to 46.5 Indian rupees.

The mean (median) asset size of American information technology firms is $84.53 billion ($60.99 billion), with AT&T ($265.25 billion) as the largest and Qualcomm Inc. ($27.45 billion) as the smallest of the group. The mean (median) asset size of Indian information technology firms is Rs.185.97 billion (Rs.117.74 billion), with Reliance Communications (Rs.825.94 billion) as the largest and Mphasis (Rs.11.74 billion) as the smallest of the group.

The mean (median) asset size of American capital good firms is $38.28 billion ($34.47 billion), with Caterpillar ($68.78 billion) as the largest and Illinois Tool Works ($15.21 billion) as the smallest of the group. The mean (median) asset size of Indian capital good firms is Rs. 63.42 billion ($31.46 billion), with L&T (Rs.190.15 billion) as the largest and Thermax (Rs.9.62 billion) as the smallest of the group.

As mentioned earlier, the primary objective of this study is to compare the boards of firms in two different countries for two different industries, one that is closely related and one that is not. In this study, we focus on three board variables: board size, board independence, and board leadership which are defined as follows: Board size is defined as the number of directors on board, board independence is defined as the percentage of directors that are independent, and board leadership is a binary variable taking the value of '1' if the CEO is also the chairman of the board, and '0' if the two positions are split. For Indian firms, CEO position is sometimes defined as Managing Director.

Table 2 reports on the board size variable, Table 3 reports on board independence (percentage of independent directors), and Table 4 reports on board leadership. Both US firms and Indian firms have to report the number of independent directors on their boards as per listing requirements. We use proxy statements to obtain board information for US firms, and annual reports to obtain board information for Indian firms.

In each of the three tables, Panel A compares a particular board variable of US firms and Indian firms in the information technology industry and Panel B compares the same board variable of US firms and Indian firms in capital goods industry. We report mean and median of each of the three board variables for both industries, for both countries. Significance for difference in means is obtained using the 2-sided t-test. Statistical significance for differences in medians is obtained using the Wilcoxon Rank Sum test.

Table 1: Descriptive Statistics

Panel A: Information Technology				
US Firms	**Year End**	**Total Assets**	**Sales**	**Net Income**
Microsoft Corp.	06/30/09	77,888	58,437	14,569
Google Inc.	12/31/08	31,768	21,795	4,227
Apple Inc.	09/26/09	53,851	36,537	5,704
IBM Corp.	12/31/08	109,524	103,630	12,334
AT&T Inc.	12/31/08	265,245	124,028	12,867
Cisco Systems	07/25/09	68,128	36,117	6,134
Hewlett-Packard	10/31/08	113,331	118,364	8,329
Oracle Corp.	05/31/09	47,416	23,252	5,593
Intel Corporation	12/27/08	50,715	37,586	5,292
Qualcomm Inc.	09/27/09	27,445	10,416	1,592
Mean		**84,531**	**57,016**	**7,664**
Median		**60,990**	**37,062**	**5,919**
Indian Firms	**Year End**	**Total Assets Rupees Millions**	**Sales Rupees Millions**	**Net Income Rupees Millions**
Infosys	03/31/09	178,090	202,640	58,190
Tata Consultancy	03/31/09	134,870	224,040	46,960
Bharti Airtel	03/31/09	353,580	340,480	77,440
Wipro	03/31/09	175,290	216,130	29,740
Reliance Communications	03/31/09	825,940	150,870	48,020
HCL Technologies	06/30/09	40,020	46,750	9,970
Idea Cellular	03/31/08	100,610	67,120	10,440
Mphasis	10/31/08	11,740	14,520	2,650
Siemens	09/30/08	20,700	86,100	5,930
Tech Mahindra	03/31/09	18,810	43,580	9,870
Mean		**185,965**	**139,223**	**29,921**
Median		**117,740**	**118,485**	**20,090**
Panel B: Capital Goods				
	Year End	**Total Assets**	**Sales**	**Net Income**
United Technologies	12/31/08	56,469	58,681	4,689
The Boeing Company	12/31/08	53,779	60,909	2,672
Caterpillar Inc.	12/31/08	67,782	51,324	3,557
Honeywell International	12/31/08	35,490	36,556	2,792
Lockheed Martin	12/31/08	33,439	42,731	3,217
General Dynamics	12/31/08	28,373	29,300	2,459
Illinois Tool Works Inc.	12/31/08	15,213	15,869	1,519
Deere & Company	10/31/08	38,734	28,437	2,052
Raytheon Company	12/31/08	23,296	23,174	1,672
Northrop Grumman	12/31/08	30,197	33,887	(1,262)
Mean		**38,277**	**38,087**	**2,337**
Median		**34,465**	**35,222**	**2,566**
Indian Firms	**Year End**	**Total Assets**	**Sales Rupees**	**Net Income**
BHEL	03/31/09	130,880	285,040	31,380
L&T	03/31/09	190,150	342,500	34,820
ABB	12/31/08	21,190	73,710	5,470
Crompton Greaves	03/31/09	12,960	49,720	3,970
Bharat Electronics	03/31/09	38,080	46,270	7,460
Suzlon Energy	03/31/09	139,100	72,540	(4,690)
Thermax	03/31/09	9,620	32,010	2,870
Areva T&D	12/31/08	11,940	28,370	2,260
Punj Lloyd	03/31/09	55,470	69,200	3,210
BEML Ltd	03/31/09	24,830	29,310	2,690
Mean		**63,422**	**102,867**	**8,944**
Median		**31,455**	**59,460**	**3,590**

This table reports descriptive statistics for firms used in our analysis. Sample consists of forty firms. Panel A reports on twenty information technology firms: ten US firms and ten Indian firms. Panel B reports on twenty capital goods firms: ten US firms and ten Indian firms. Asset size, sales, and net income figures are from annual reports.

Table 2: Board Size

Panel A: Information Technology					
US Firms	**Proxy Date**	**Board Size**	**Indian Firms**	**Annual Report**	**Board Size**
Microsoft Corp.	09/29/09	10	Infosys	03/31/09	16
Google Inc.	03/24/09	10	Tata Consultancy	03/31/09	11
Apple Inc.	01/07/09	8	Bharti Airtel	03/31/09	16
IBM Corp.	03/09/09	13	Wipro	03/31/09	10
AT&T Inc.	03/11/09	15	Reliance Communications	03/31/09	5
Cisco Systems	09/23/09	13	HCL Technologies	06/30/09	7
Hewlett-Packard	01/20/09	11	Idea Cellular	03/31/08	12
Oracle Corp.	08/21/09	12	Mphasis	10/31/08	10
Intel Corporation	04/03/09	12	Siemens	09/30/08	13
Qualcomm Inc.	01/13/09	12	Tech Mahindra	03/31/09	14
Mean		**11.60**	**Mean**		**11.40 (-0.15)**
Median		**12.00**	**Median**		**11.50 (0.00)**
Panel B: Capital Goods					
US Firms	**Proxy Date**	**Board Size**	**Indian Firms**	**Annual Report**	**Board Size**
United Technologies	02/20/09	14	BHEL	03/31/09	16
The Boeing Company	03/13/09	9	L&T	03/31/09	17
Caterpillar Inc.	04/21/09	14	ABB	12/31/08	8
Honeywell International	03/12/09	10	Crompton Greaves	03/31/09	8
Lockheed Martin	03/13/09	13	Bharat Electronics	03/31/09	16
General Dynamics	03/20/09	10	Suzlon Energy	03/31/09	6
Illinois Tool Works Inc.	03/25/09	10	Thermax	03/31/09	9
Deere & Company	01/15/09	12	Areva T&D	12/31/08	8
Raytheon Company	04/24/09	8	Punj Lloyd	03/31/09	10
Northrop Grumman	04/17/09	13	BEML Ltd	03/31/09	11
Mean		**11.30**	**Mean**		**10.90 (-0.28)**
Median		**11.00**	**Median**		**9.50 (0.61)**

*This table reports board size for firms used in our analysis. Forty firms are included in the sample. Panel A reports on twenty information technology firms: ten US firms and ten Indian firms. Panel B reports on twenty capital goods firms: ten US firms and ten Indian firms. Board size is the number of directors on the board, and is obtained from proxy statements for US firms and annual reports for Indian firms. Significance for difference in means is obtained using the two-sided t-test, and statistical significance for differences in medians is obtained using the Wilcoxon rank sum test. *, **, and *** mean that Indian firms value is significantly different than US firms value at the 10%, 5%, and 1% level respectively. T-stats for difference in means and Z-scores for difference in medians are given in parenthesis below the significance indicators.*

DISCUSSION OF RESULTS

The objective of this study is to study the country effect and industry effect on board structures. The results of our comparison of the board structures of US firms and Indian firms in two different industries are reported in four tables. As discussed above, Table 1 provides descriptive statistics of the forty firms used in our analysis.

Table 2 reports results of a comparison of board size of US firms and Indian firms in technology and capital good sectors with Panel A reporting results for technology firms and Panel B reporting results for capital goods. The mean (median) number of directors of US technology firms is 11.60 (12.00). AT&T has the largest board with 15 directors and Apple Inc. has the smallest board with eight directors. The mean (median) number of directors of Indian technology firms is 11.40 (11.50). Infosys and Bharti Airtel have the largest board with 16 directors and Reliance Communication has the smallest board with five directors. Both mean and median values for Indian technology firms are not significantly different than values for US technology firms. The mean (median) number of directors of US capital goods firms is 11.30 (11.00). United Technologies and Caterpillar Inc. have the largest board with 14 directors and Raytheon Company has the smallest board with eight directors. The mean (median) number of directors of Indian capital goods firms is 10.90 (9.50).

L&T has the largest board with 17 directors and Suzlon Energy has the smallest board with six directors. Both mean and median values for Indian capital goods firms are not significantly different than values for the corresponding US firms.

These results indicate that both US firms and Indian firms have similar sized boards in both for technology and capital goods industries. Another finding is that three of the four firms with largest boards are also the biggest in terms of size. This is supportive of the Coles, Daniel and Naveen (2008) finding that large complex firms need bigger boards. Table 3 reports results of a comparison of board independence of US firms and Indian firms in the technology and capital good sectors with Panel A reporting results for technology firms and Panel B reporting results for capital goods firms.

Table 3: Board Independence

Panel A: Information Technology					
Us Firms	**Proxy Date**	**Independent Directors (%)**	**Indian Firms**	**Annual Report**	**Independent Directors (%)**
Microsoft Corp.	09/29/09	80%	Infosys	03/31/09	50%
Google Inc.	03/24/09	70%	Tata Consultancy	03/31/09	55%
Apple Inc.	01/07/09	88%	Bharti Airtel	03/31/09	50%
IBM Corp.	03/09/09	85%	Wipro	03/31/09	60%
AT&T Inc.	03/11/09	93%	Reliance Communications	03/31/09	80%
Cisco Systems	09/23/09	85%	HCL Technologies	06/30/09	86%
Hewlett-Packard	01/20/09	82%	Idea Cellular	03/31/08	50%
Oracle Corp.	08/21/09	67%	Mphasis	10/31/08	40%
Intel Corporation	04/03/09	83%	Siemens	09/30/08	46%
Qualcomm Inc.	01/13/09	83%	Tech Mahindra	03/31/09	50%
Mean		**82%**	**Mean**		**57%*** (-4.70)**
Median		**83%**	**Median**		**50%*** (2.96)**
Panel B: Capital goods					
US Firms	**Proxy Date**	**Independent Directors (%)**	**Indian Firms**	**Annual Report**	**Independent Directors (%)**
United Technologies	02/20/09	86%	BHEL	03/31/09	50%
The Boeing Company	03/13/09	89%	L&T	03/31/09	53%
Caterpillar Inc.	04/21/09	93%	ABB	12/31/08	50%
Honeywell International	03/12/09	90%	Crompton Greaves	03/31/09	75%
Lockheed Martin	03/13/09	92%	Bharat Electronics	03/31/09	44%
General Dynamics	03/20/09	80%	Suzlon Energy	03/31/09	67%
Illinois Tool Works Inc.	03/25/09	90%	Thermax	03/31/09	56%
Deere & Company	01/15/09	83%	Areva T&D	12/31/08	38%
Raytheon Company	04/24/09	88%	Punj Lloyd	03/31/09	50%
Northrop Grumman	04/17/09	85%	BEML Ltd	03/31/09	27%
Mean		**88%**	**Mean**		**51%*** (-8.20)**
Median		**88%**	**Median**		**50%*** (3.75)**

*This table reports board independence for firms used in our analysis. Forty firms are included in the sample. Panel A reports on twenty information technology firms: ten US firms and ten Indian firms. Panel B reports on twenty capital goods firms: ten US firms and ten Indian firms. Board independence is the percentage of independent directors on the board, and is obtained from proxy statements for US firms and annual reports for Indian firms. Significance for difference in means is obtained using the two-sided t-test, and statistical significance for differences in medians is obtained using the Wilcoxon rank sum test. *, **, and *** mean that Indian firms value is significantly different than US firms value at the 10%, 5%, and 1% level respectively. T-stats for difference in means and Z-scores for difference in medians are given in parenthesis below the significance indicators.*

The mean (median) percentage of independent directors of US technology firms is 82.0% (83.0%). AT&T has the most independent board with 93 percent independent directors and Oracle Inc. has the least independent board with 67 percent. The mean (median) number of directors of Indian technology firms is 57.0% (50.0%). HCL Technologies has the most independent board with 86 percent independent directors and Mphasis has the least independent board with only 40 percent independent directors. Both mean and median values for Indian technology firms are significantly different than values for US firms at the one percent level. The mean (median) percentage of

independent directors of US capital goods firms is 88.0% (88.0%). Caterpillar Inc. has the most independent board with 93 percent independent directors and General Dynamics has the least independent board with 80 percent. The mean (median) number of directors of Indian capital goods firms is 51.0% (50.0%). Crompton Greaves has the most independent board with 75 percent independent directors and BEML has the least independent board with only 27 percent independent directors. Both mean and median values for Indian technology firms are significantly different than values for US firms at the one percent level. These results indicate that Indian firms have less independent boards as compared to US firms in both the technology and capital goods sectors.

Table 4 reports the results of a comparison of board leadership of US firms and Indian firms in both the technology and capital good sectors. If the CEO also holds the position of Chairman then we define the dual role as '1' and otherwise '0.' Panel A reports results for technology firms and Panel B reports results for capital goods.

Table 4: Board Leadership

Panel A: Information Technology					
US Firms	**Proxy Date**	**Dual Role (0 Or 1)**	**Indian Firms**	**Annual Report**	**Dual Role (0 or 1)**
Microsoft Corp.	09/29/09	0	Infosys	03/31/09	0
Google Inc.	03/24/09	1	Tata Consultancy	03/31/09	0
Apple Inc.	01/07/09	0	Bharti Airtel	03/31/09	1
IBM Corp.	03/09/09	1	Wipro	03/31/09	1
AT&T Inc.	03/11/09	1	Reliance Communications	03/31/09	0
Cisco Systems	09/23/09	1	HCL Technologies	06/30/09	1
Hewlett-Packard	01/20/09	1	Idea Cellular	03/31/08	0
Oracle Corp.	08/21/09	0	Mphasis	10/31/08	0
Intel Corporation	04/03/09	0	Siemens	09/30/08	0
Qualcomm Inc.	01/13/09	0	Tech Mahindra	03/31/09	0
Mean		**0.50**	**Mean**		**0.30 (-0.88)**
Median		**0.50**	**Median**		**0.00 (0.41)**
Panel B: Capital Goods					
US Firms	**Proxy Date**	**Dual Role (0 Or 1)**	**Indian Firms**	**Annual Report**	**Dual Role (0 or 1)**
United Technologies	02/20/09	0	BHEL	03/31/09	1
The Boeing Company	03/13/09	1	L&T	03/31/09	1
Caterpillar Inc.	04/21/09	1	ABB	12/31/08	0
Honeywell International	03/12/09	1	Crompton Greaves	03/31/09	0
Lockheed Martin	03/13/09	1	Bharat Electronics	03/31/09	1
General Dynamics	03/20/09	0	Suzlon Energy	03/31/09	1
Illinois Tool Works Inc.	03/25/09	1	Thermax	03/31/09	0
Deere & Company	01/15/09	0	Areva T&D	12/31/08	0
Raytheon Company	04/24/09	1	Punj Lloyd	03/31/09	1
Northrop Grumman	04/17/09	1	BEML Ltd	03/31/09	1
Mean		**0.70**	**Mean**		**0.60 (-0.45)**
Median		**1.00**	**Median**		**1.00 (0.85)**

*This table reports board leadership for firms used in our analysis. Forty firms are included in the sample. Panel A reports on twenty information technology firms: ten US firms and ten Indian firms. Panel B reports on twenty capital goods firms: ten US firms and ten Indian firms. Dual role is equal to '1' if the CEO also holds the chairperson position and '0' otherwise. The information is obtained from proxy statements for US firms and annual reports for Indian firms. Significance for difference in means is obtained using the two-sided t-test, and statistical significance for differences in medians is obtained using the Wilcoxon rank sum test. *, **, and *** mean that Indian firms value is significantly different than US firms value at the 10%, 5%, and 1% level respectively. T-stats for difference in means and Z-scores for difference in medians are given in parenthesis below the significance indicators.*

The mean (median) value for board leadership of US technology firms is 0.50 (0.50), and for Indian technology firms is 0.30 (0.00). It indicates that fifty percent of US firms and thirty percent of Indian technology firms have a dual role for the CEO. However, these mean and median values for Indian firms are not significantly different than the values for US firms. The mean (median) value

for board leadership of US capital goods firms is 0.70 (1.00), and for Indian capital goods firms is 0.60 (1.00). It indicates that seventy percent of US firms and sixty percent of Indian capital goods firms have a dual role for the CEO. These mean and median values for Indian firms are not significantly different than values for US firms either.

These results indicate that US firms and Indian firms have similar board leadership structure for both technology firms and capital goods firms. To summarize, the results of a comparison of board structures of US firms and Indian firms suggests that Indian firms have similar board size and board leadership structure irrespective of the industry. However, Indian firms are less independent than US firms for both industries indicating that there is more of a country effect in the determination of board structures.

CONCLUSION

The Board of Directors is an important institution in the corporate governance of firms. Studies find that a relationship exists between board structures and board actions and imply that some board characteristics are more desirable than others. The three most important board characteristics identified in the literature are board size, board independence, and board leadership. Several studies have examined factors affecting the determination of these board characteristics. However, our study contributes by examining the issue in an international setting. We analyze country and industry effects on board structures. We compare the board structures of large US firms and Indian firms in the technology and capital goods sectors. Our findings are supportive of a stronger country effect relative to industry effect. We find that US firms and Indian firms have similar board size and board leadership structures in both technology and capital goods sectors. However, boards of Indian firms have less independent directors as compared to US firms be it the technology sector or the capital goods sector.

As companies become more international and operate under different regulatory and corporate cultures across the globe, their boards will be affected. Our study examines a narrow topic related to this discussion, and offers interesting avenues for further research. For example, it may be interesting to compare the board structure of companies which have expanded beyond their home countries with the board structure of purely domestic companies.

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BIOGRAPHY

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ARE BUYBACKS INCREASING EPS?

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ABSTRACT

Trends indicate that treasury shares or buyback shares are gaining new momentum and intensity and maybe effecting reported earnings per share. This study was undertaken by evaluating the buyback activity of the Standard and Poor's 500, for the period of 2005-2008 to the Hribar et al (2004 and revised 2006) study of buybacks for their period of 1988-2001. Their study reflected that buybacks were not dominant due to their tri-model of low number of share being repurchased, the high number of companies experiencing a loss and high P/E multiples.. This study experienced greater frequency and intensity of buybacks, due to a reversal in the three conditions being a larger number of shares purchased,) lower incident of losses and lower P/E multiples. The findings are that buybacks are more frequent, more intense, and are having an increased accretive effect on EPS. As a solution proposed here is a new EPS model that reports EPS in segments; those from operations and those from buybacks when the effect is $.01 or more. This new EPS model is responsive to the changing financial landscape and is deserving of attention at this time of international accounting assessment.

JEL: M41, G35

KEYWORDS: Buybacks, Treasury Shares, Stock Repurchases, Earnings Per Share,

INTRODUCTION

When a company buys its own stock back, the repurchased stock is referred to as treasury stock in accounting terminology. The more generic term of this is "buybacks". One could suppose that the term comes from putting it back into the treasury or as the Merriam Webster dictionary defines treasury as a "place in which stores of wealth are held." The Merriam Webster defines treasury stock as stock that is repurchased and held as an asset. This is partially untrue since treasury stock is not held as an asset but as negative equity. When treasury stock is purchased, the account Treasury Stock is debited and Cash is credited. However, the treasury-stock account is not included in the asset section of the balance sheet but it is included as a contra-equity account since it is subtracted from equity. Besides, any gains or losses realized from the purchase or sale of treasury stock are not reported on the income statement, even though they have tax consequences. The gains or losses are added or subtracted from equity and circumvent the income statement. Treasury stock does not vote and it does not collect dividends. It is more or less taken out of circulation for the time being.

Treasury stock affects earnings per share (EPS) since the denominator of the EPS is outstanding stock, which excludes treasury shares. Thus when treasury shares are purchased the outstanding stock is reduced; and if it is of magnitude, it may result in increasing EPS even though net income has not increased. The following is the formula for EPS.

$$EPS = \frac{Net\ Income - Preferred\ Dividends}{Issued\ Shares - Treasury\ Shares} \quad (1)$$

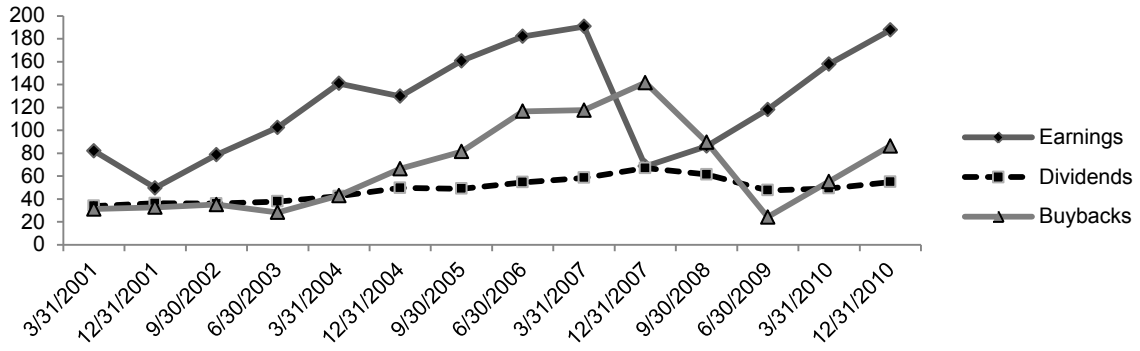
Surprisingly, EPS was not originally an accounting item; rather it emerged from the finance community. The financial community was the creator of EPS, which is used to report as a one-liner the results of a company's performance. In actuality, it reports on the income of a company and gives no reflection of the resources used to create those returns. In the earlier days of accounting development the Committee on Accounting Procedure, specifically Accounting Research Bulletin (ARB) No. 32 in 1947 "admonished

financial statement users against placing undue prominence on a single net income or earnings per share amount". One item of the EPS that is an equity issue is its treasury shares. In the past, they were not of consequence. However, the economic landscape is continually changing, especially in this regard specifically since 2005. According to Horngren, (1974):

The earning (net income) applicable to each share of common stock is perhaps the single most-quoted figure in an annual report, primarily because investors are so heavily interested in the effect of such earning on the market price of the stock. It is heavily documented that the market reacts very strongly to EPS (p.276).

This research focuses on the surge of buyback activity for the period of 2005-2008. See the following Standard and Poor's 500 (S&P 500) figure 1, of earnings, dividends, buyback for the period of 2001 through 2010. The buybacks (red) spike up between 2005 through 2008 while the dividends (purple) are relatively even and the earnings are somewhat in tandem with the buybacks. Instinctively we see a reversal in 2008 and 2009 due to the US Financial Crisis, however recovering trend of upward buybacks is reflected for 2010. The supposition is that buybacks may be becoming the latest financial instrument that is not being reflected in the EPS model that is insidiously increasing EPS. Previously research by Hribar, Jenkins & Johnson (2006) covering the period of 1988-2001 and found that buybacks were having a marginal anti-dilutive or accretive effect on EPS. One explanation given was that enormous amounts of shares needed to be repurchased on a quarterly basis to affect EPS However; given the period post 2004 the trend as depicted seems to give credence that buybacks are acute.

Figure 1: S&P 500 Companies- Earnings, Dividends and Buybacks



The above figure gives the trends of earnings (blue), dividends (purple), buybacks (red) and dividends with buybacks (green) for the period 2001 through 2010 by quarters. The figure reflects that the buybacks have been on the up rise starting in 2005 through 2007, with a decrease in 2008 and 2009 due to the financial crisis and a further upswing in 2010. This reflects stronger presence of buybacks that was not seen earlier. Source of Data: www.standardand poors.com

In general, terms, the purpose of this paper is to quantify the effect of buybacks. If they do have measureable effect then value is added by devising a new EPS model that communicates earnings from operations apart and separate from earnings due to buyback activity, along with a combined EPS. This is of interest at this point in time as the Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB) are working together to design a just global accounting application that reflects the substance of financial transactions.

The rest of the paper will be followed by four sections. The first is the literature review, which give an overview on this topic, which is followed by the generated hypotheses. The data will be the S&P 500 on a quarterly basis from 2005-2008 and the methodology will to replicate in part a prior study to determine if the effects of the buybacks on EPS are the same. Thereafter is presented the results and some concluding comments.

LITERATURE REVIEW

The topic of treasury shares is considered the accounting piece, while the topic of buybacks is considered the financial piece, which gives way to a disconnect in the literature. The accounting research on EPS is much less and centers on its computation; its usefulness, effectiveness, accuracy and transparency. The current accounting pronouncement that governs EPS is Statement of Financial Accounting Standards (SFAS) No. 128 paragraph 8 " the objective of basic Earnings Per Share (EPS) is to measure the performance of an entity over the reporting period". In contrast, the research on EPS in the financial realm is concerned with its connection to performance and valuation. Earnings that are off by a penny from the projected results can have a tremendous effect on the market value (Skinner & Sloan, 19980).

Rolen's 1969 "Evaluation of Earnings Per Share," was about the inadequacy of Accounting Principle Board (APB) No.9. His research reinforces the movement that was going on at that time to move away from just one EPS calculation gives more concrete direction on how and when different EPS data should be presented. The research focused on the problem when the financial operations of a company are primarily measured by a one dimensional EPS. APB No. 9 was very vague and gave several directions that could be undertaken to calculate EPS and the overall impression was that the Opinion did not give clear enough direction that resulted in an inadequate EPS computation. The purpose of Rolen's study was to expose how little comparability there was in the computation of EPS at that time. This provided good evidence that the profession reflected in changes that were implemented with the adoption of APB No.15, prescribing more uniformity in the EPS calculation and the institution of primary and fully diluted earnings per share when a complex capital structure in place.

Greco (1972) preformed a study to determine the statistical usefulness of the revised EPS as dictated under APB No.15. Twelve companies were evaluated over a ten-year period of 1957-1966. The EPS during this period were calculated under APB No. 9, which was the GAAP of that time. Greco recomputed the EPS for these companies using the APB No.15 retroactively to determine if there was a statistical difference between the two different accounting pronouncements. Greco tested empirically two hypotheses: 1) There is no statistical difference between primary and traditionally measured earnings per share distributions over time and 2) There is no statistical difference between fully- diluted and traditionally measured earnings per share distributions over time. In order to test this Greco (1972) had each of the alternative earnings per share amounts regressed against a dummy time variable. Greco's conclusion was that "the revised earnings per share measurement procedures had no impact on a principal user group (investors) of the earnings per share measures. Accordingly, he concluded that the Accounting Principles Board did not make a notable improvement in financial reporting by issuing APB No. 15. Thus, his contribution was a positive assessment of the EPS computation used at that time.

Jolly (1978) topic was "An Alternative Method for the Computation of Earnings Per Share. Here Jolly examines the EPS as prepared under APB No. 15. He proposes a unique alternative method that gives recognition to the difference between distributed and undistributed earnings. It recognizes that earnings distributed or dividends are not subjected to dilution. The alternative method makes another modification in that it reflects the effects that the dilution caused by stock equivalents may have on the book value of a company. To test this on actual data Jolly (1978) collected EPS data for companies listed on the New York Stock Exchange though the Compustat tape for years 1970-1974. This generated 922 firms The Wilcoxon rank sum test was performed to see if there was a significant statistical difference between the EPS published and Jolly's alternative computation. There was no difference between the primary EPS, and his proposed alternative EPS, which were found to be the same. This reflects an assessment the EPS in practice, which proved again to be adequate.

Casson and McKenzie (2007) devised an alternate method for calculating fully diluted EPS. Their model was fashioned after the Black-Scholes Model, and allowed for anti-dilution residual securities to be

factored into the calculation, which is not the case with current GAAP. This more current study covers that GAAP of FASB 128 *Earnings Per Share* which is presently operative. Their findings were that the method per FASB 128 for fully diluted EPS, specifically the treasury stock method has a poor performance when evaluated against their benchmark. This literature reflects the financial sophistication that is used for derivative valuation, can be tailored to EPS to generate a better measure.

These research pieces on the accounting aspects of EPS give testimony to the usefulness of academic assessment of accounting models which when continually evaluated contribute vastly to the body of knowledge. When it comes to the extensive financial literature, the research on buybacks can be arbitrarily summarized in one of four compartments 1) as a signaling device, 2) as a substitution for dividends, 3) as a mitigation of agency cost and 4) as an earnings managing device.

Signaling Device

Much of the financial literature offers support that buybacks are managements 'way of sharing inside information that shares are undervalued. This is referred to as the signaling theory. Vermaelen (1981) published one of the first papers in this regard. The signal that repurchases give out is that " the observation that repurchases via tender offers are followed by abnormal increase in earnings per share and that mainly small firms engage in repurchase offers, provides further support for the signaling hypothesis." (p.139). Notice that in a statement that the increase is attributed to the increase in EPS. To investors, it is not obvious if an increase in EPS is due to an increase in the operating income, or due the mechanics of the treasury shares, which reduce the EPS denominator. Vermaelen also called for more regulation to resolve the asymmetric information problems. The United States, according to Vermaelen is one of the few countries that allow firms to make tender offers for their shares at prices above market, and this could lend itself to insider manipulation. This is especially so when the insiders hold a sizeable portion of stock and may be offering to buy the stock at a price higher than the market.

Other studies have shown that the prices do outperform the market for an extended period after the repurchases. Ikenberry, Lakonishok and Vermaelan (1995) documented that the stocks of companies that are repurchased that are considered "value stocks" increase in market value by an abnormal percent of 45.3% over the four year buy and hold period. While Kahle (2001) finds other evidence that buybacks are functions of stock option plans; that they are a pragmatic solution to getting the shares in house to meet this requirement.

"What Do We Know about Stock Repurchase?", Grullon & Ikenberry, (2000) tell us the stock repurchase movement is relatively young compared to the history of the United States' corporation. It essentially started in the 1980s and again, reinforces that repurchases are a signal of management's confidence in the stock's value, and that management is expressing it disagreement with the current market price. The issue addressed here is that the disclosure concerning buybacks is lax. They are not of equal vigor that is found for example in the disclosure requirement for insider trading and other items. There is not uniform presentation or disclosure requirement for buybacks, which is a disadvantage to the investor. They noted that since it is not required, few companies disclose information in this regard. Canada has a rule similar to our Rule 10b-18, which is more restrictive. Here proposed is that similar restrictive measures should be adopted here in the United States. Canadian law requires all repurchase programs to be completed within one year, and data in regard to this activity is readily available and disclosure is far more extensive and meaningful (Grullon & Ikenberry 2000).

Chan, Ikenberry, Lee & Wang (2010) take a very different perspective. This research piece explores the darker aspect of the signaling theory. Here the contention is that there is little cost to announce a repurchase announcement, that they are not binding and since managers are aware of the positive

signaling effect of a stock repurchase some may consider share repurchases as a mechanism to mislead investors to boost stock prices.

Substitution

Fama and French (2000) discuss the disappearing dividends with the corresponding increase in repurchases. The opening observation is that the dividends were once at an all time high , that the characteristic of the dividend payers is that they are more profitable than the non- payers, that they derive more of their market value from expected growth and are not the companies issuing new equity. In regard to companies that are involved in repurchases, they follow the same pattern of the dividend payers, and most of the companies involved in repurchases are also those which payout dividends. The reason cited is the companies have become aware of the tax disadvantage of dividends. The tax law in effect at that time taxed ordinary dividends as regular income at the top ordinary rate of 35%, while the long term capital gain tax was taxed at 15% which reflects a 20% substantial difference. Post 2001 due mainly to President George Bush's Economic Growth and Tax Relief Reconciliation Act of 2001 most ordinary dividends and long term capital gain rates are both at 15%. Mindful however, that the capital gain tax can be avoide or deferred depending upon timing of the sale.

In the Grullon and Michaely, 2002 study 1600 chief financial officers were surveyed in 1997 and 95% responded that they will pay out cash to their shareholders in the form of buyback shares. The repeated contribution is that that corporations are substituting share repurchases for dividends. Also, that the passage of Rule 10b-18 by the SEC (Security Exchange Commission) in 1982 made repurchases less restrictive. Also, the difference in the tax treatment of dividends and capital gains for repurchases was the driving factor for the preference of repurchases.

In *Payout Policy in the 21st Century,* Brav, Graham, Harvey & Michaely (2005) give a survey of dividends in the 21st Century. Some things are the same as outlined by Lintner (1962) dividend model and other thing are very different. The most noteworthy is their finding that repurchases are an efficient way to return capital, that dividends should not be cut, that 70% of managers would prefer to pay out capital for the first time with share repurchases only, and 76% of managers surveyed think that repurchase of shares automatically increases EPS. Most recently, Bozanic (2009) concurs, "There are two major mechanisms by which firms distribute cash to shareholder; through dividends and share repurchases." Historically, dividends have been the preferred method, but in recent years, share repurchases have become more popular, with more firms using repurchases than dividends to distribute cash (p.1).

Mitigation of Agency Cost

Many state that the "new' dividends of the repurchase are driven by management's desire to increase the stockholders wealth through market appreciation. More specifically to that "stock repurchase is related to agency cost mitigation (Lo, Wang & Yeh 2008)". This is driven by the agency problem first cited by Jensen & Meckling (1976) that purports management is interested in self-serving at the expense of the stockholder. Another area authored by Jensen (1986) is the free cash flow concept, which hypothesizes that companies buy the shares to get rid of excess cash and to avoid or mitigate agency problems. It reduces cash and oversight obligations by dispersing the cash out of management's hands and back to the stockholder.

Earnings Management Device

Management may announce targeted EPS that are projected for and an upcoming quarter, and then those targets are compared to the actual results. Earnings figures that are off by one penny can have a tremendous effect on the market value (e.g. Skinner & Sloan 1999, Barth, Elliot & Finn 1999, Larcker

2003). Thus, management is motivated to present the figures in the most favorable light. This is exacerbated by the corporate stock option plans that many executive now enjoy and is further compounded by the agency problem.

Even further, Grullon and Michaely (2002) state that "in some countries such as Austria, Norway and Israel, open-market share repurchases are prohibited and are considered price manipulation. Although share repurchase programs had never been explicitly prohibited in the United States, there is reason to believe that regulatory agencies have been concerned with the potential impact of these programs on stock prices. This concern was expressed in the following statement from the Senate Committee many years ago: "Whatever the motive behind the repurchase program, if the repurchases are substantial they will have a significant impact on the market" (Senate Report No. 550, 90th Congress; 1967).

Along these same lines is Myers, Myers & Skinner (2007) research on earnings momentum and earnings management. Their research supports that companies that are able to sustain long periods or strings of time in which consecutive increases in EPS are realized, leads to higher market prices and more valuable stock-based compensation for managers, spark incentive for managers to " make the quarter's number" (p.3). Gumport (2007) finds that buybacks are now of such volume that they are distorting the financials on many different levels.

According to Oded & Michel (2008), performed what if scenarios of payout policies for ExxonMobil for the years 2002-2006. It showed that for ExxonMobil more than 16% of EPS growth over the past four years is an artificial result of its repurchases program and cannot be associated with improvement in operating performance. An under informed or naïve analyst might appropriately attribute this increase to enhanced operation efficiency.

The following two papers have tied repurchases to managements' motivation to self-serve by driving up the value of stock options. Griffin and Zhu (2010) finds "that CEO stock options influence the choice, amount and timing of funds distributed as a buyback (p. 1). In addition, Cheng, Harford and Zhang (2010) find "that when a CEO's bonus is directly tied to earnings per share (EPS), his company is more likely to conduct a buyback and the magnitude of the buyback tends to be larger" (p.1).

One favored study covered the accounting and the financial aspects of EPS by Hribar et al (2006) covered the period of 1988 thorough 2001 which studied a sample of 133,149 firm- quarters, of which 26,410 had firm quarters with repurchases. The findings were that most of the repurchases in their sample was not EPS accretive. Accretive is the term that is used when the transaction make the EPS increase. The reasons given were that 1) the volume of buybacks was relatively small 2) high percentage of firms had losses and 3) high P/E multiples.

In their research, by Hribar et al. the authors hypothesize that the repurchase of shares is a tool employed to manage earnings per share. Treasury shares reduce the number of shares outstanding, which can cause an increase or accretive earnings per share. The impetus for the study was a survey of 384 CFOs of which 75% reported that the desired effect of a stock repurchase was to increase EPS. According to the summary, "the findings were that only 19.9% of the stock repurchases in our sample increased quarterly EPS by one penny or more when the foregone profit on funds used to finance the buyback- the numerator effect was ignored (p.31)". This leads to the question if these findings would be similar using more current buyback data. Investors perceive EPS as the measure of the firms earning capacity.

HYPOTHESES

The accounting literature focuses on evaluating the appropriateness of the EPS model at different junctures of financial complexity. The financial literature presents that repurchases are on the rise, and

maybe instruments of managements' desire to booster EPS, market price, particularly as relate this relates to stock options and that more regulation and transparency in this regard is warranted. Thus, the research interest is to quantify the effect buyback shares are having in a current period of 2005-2008 and compare this to results published for the period of 1988-2001. This leads to the following research question; is the situation for the 2005-2008 period the same as it was for the Hribar et al 2006 study that took the form as the following hypothesis:

H_1: Buybacks are more frequent for the period of 2005-2008, than the period of Hribar's et al (2006) study of 1988-2001.

Since 2008 was a difficult year financial for the economy, due to the fallout from the Financial Crisis of 2007, which may distort the above results, this generated a research question excluded 2008 that took the form as the following hypothesis:

H_2: Buybacks are more frequent for the period of 2005-2007, than the period of Hribar's et al (2006) study of 1988-2001.

Frequency is a measure of occurrence, not necessarily impact or magnitude. This leads to the following question that took the form as the following hypothesis:

H_3: The accretive affects of the buyback are on a larger scale for the period of 2005-2008, than the period of Hribar's et al (2006) study of 1988-2001.

DATA AND METHODOLOGY

The object was to collect a related data sample that was to replicate in part the data analysis that was made in the Hribar's et al 2006 study to test the hypothesis that treasury shares are having a more dramatic effect on the computation of EPS. In the extensive Hribar et al study (2006) "the stock repurchase sample spanned s a 13-year period from 1988 to 2001 and included only U.S. firms listed on the NYSE, AMEX or NASDAQ exchanges" (p.9). The stock repurchases sample includes all firms that reported a quarterly stock repurchase of $10,000 or more and excluded financial, utilities and transportation companies since they have regulatory restriction on treasury stock repurchases. Their extensive study yielded an overall sample of 133,149 firm quarters, and a sample of 26,480 firm quarters with stock repurchases.

The sample of this study was the S&P500, on a quarterly basis for 2005, 2006, 2007 and 2008. Of the 500 companies for which the data was requested 490 was retrieved in 2005 and 497 was retrieved for 2006, 2007 and 2008. The company data was retrieved by ticker symbol for the companies that were in a part of S&P Companies as 2009. Ten of these companies, according to ticker symbol were not in existence in 2005 due to merger, acquisitions or S&P company replacement. For 2006, 2007 and 2008 the three missing companies were General Motors (GM), Aon Corporation (AOC) and Waste Management (WMI). General Motors filed for bankruptcy in July of 2010 and was a reorganized company financed primarily by the United States Treasury by Transitory Asset Relief Fund (TARP). Aon Corporation is no longer under the ticker symbol of AOC; it has been changed to AON. In addition, the Waste Management Company is no longer under the ticker symbol of WMI; it has been changed to WM. Thus, what was retrieved was used as the database, with the above exception noted. In cases where there was missing data in the COMPUSTAT retrieval, this was supplemented by the data that was retrieved from the Business and Company Resource database. It was also necessary to determine what stock splits or reversals were announce during the study period and have them reflected correctly, and not incorrectly as possibly additional issued shares or repurchases. This was also applied to be consistent with the Hribar's et al 2006 study. Information regarding stock splits and reversals was retrieved from

Standard and Poor's was reflected as adjustments to beginning shares outstanding in the applicable quarters. In addition, similar to Hribar's et al (2006) any quarterly stock purchase that was greater than 20% of shares outstanding was eliminated. This data sample had no repurchases of this magnitude.

For 2005, COMPUSTAT retrieved 490 companies, times four quarters reported 1960 data points, of which three quarters were used to since quarter one's ending shares outstanding were used for quarter two's beginning shares outstanding and the same suit followed for quarters three and four yielding 1470 data points. For 2006, 2007 and 2008 497 companies, correspondingly yielded 1491data points for each of the three years. Next eliminated were companies that did not have repurchases. Then eliminated were the companies that were classified as financial, utilities or transportation companies according to the Global Industry Code Standard as prescribed by Standard and Poor's. Thus for the final accounting of data points which started with 1960, 1988, 1988 and 1988 for 2005-2008 for a total of 7,924 was reduced by 490,497,497 and 497 to access beginning shares outstanding for quarters two through four and was then again reduced by 571,478, 433 and 545 for quarters with no repurchases, and then reduced by 148, 205 , 206 and 195 for financial, utilities and transportation companies to an annual data base of 751,808, 852 and 751 for each of the following years respectively 2005,2006, 2007 and 2008 which is a total data pool of 3162.

Thus in comparison, the Hribar et al (2006) study yielded an overall sample size of 133,149 firm quarters and a sample of 26,400 firm quarters with stock repurchases which is 19.82% compared to this study which has an overall working sample size of 5,943 firm quarters and a sample of 3,162 firm quarters with stock repurchase which represents 53.21%. This reflects a smaller sample that reports a greater incidence of repurchases. Therefore, although this sample is for a few number of companies over a few number of years, the comparison is justified in pointing to a difference in trend specifically for this broad market index, as this smaller sample still robustly supports a difference in findings that will be discussed in the statistical findings. Also, the results here maybe even more pronounced than if the Hribar et al 2006 sample were used, as this sample includes only the large companies, and an earlier study by Vermaelen (1981) finds that buybacks are more accretive for the smaller firms that are not represented here.

For hypotheses one through three , the "as if" EPS to measure what EPS would have been without the repurchase as calculated in a replicated fashion as the Hribar et al 2006 study. This measure (ASIF_EPS) ignores the repurchase numerator effect (assumes r =0) and is computed

$$ASIF\_EPS = NI_t / (Shares\ outstanding_{t-1} + 0.5 \times Shares\ issued_t).$$

where $NI_{t\ is}$ net income before extraordinary items available for common stockholders, $Shares\ outstanding_{t-1}$ *the* shares outstanding at the beginning of the quarter and $Shares\ issued_t$ the number of shares issue. In this study, shares outstanding at the beginning of the quarter was needed and is not a data item on COMPUSTAT, and was necessary to replicate the Hribar's et al (2006) study. Thus, the ending shares outstanding of the one quarter were used as the beginning shares outstanding of the following quarter. COMPUSTAT had available at the retrieval date the total shares repurchases for the quarter. Number of issued shares for the quarter were not available but were computed by taking endings shares outstanding + treasury shares and – beginning shares to calculated issued shares.

In deference to the Hribar et al 2006 study, the following assumption was also assumed:

It was assumed that new shares are issued uniformly over the quarter. By constructing "as-if" EPS in this manner allows the repurchase timing parameter (*w)* to vary across firms. This is important because strategic repurchases intended to manage EPS are likely to be made earlier in the quarter than are other non-strategic repurchases and the computation allows for this possibility (p.11). The *ASIF_EPS was*

compared to the regular EPS, the difference was determined for each item in the sample, and the results were summarized.

RESULTS

The statistical sample results were summarized and are presented here for consideration in Table 1 and Table 2. The presented results are compared to the results of the Hribar et al 2006 study. Hribar et al 2006 was undertaken since "despite the obvious popularity of stock repurchases among corporate managers, there is little systematic evidence regarding the claim that repurchases are used to boost reported EPS" (p.4).In regard to the following hypotheses:

$H_{1:}$ Buybacks are more frequent for the period of 2005-2008, than the period of Hribar's et a (2006) study of 1988-2001.

In, the Hribar et al (2006) study the experience was that only a small percent of the sample had repurchases. It was a studied sample of 133,149 firm quarters over fourteen years of 1988-2001 and was to document the frequency of such buybacks and the frequency was 26,400 firm quarters. This is approximately a 20% frequency. This studied sample of 5,943 firm quarters over a four-year period documents buyback frequency of 3,162. This is approximately a 53% frequency. This represents more than twice the frequency from the prior study. This supports the hypothesis that this sample period of study from 2005-2008 has had buybacks at a frequency which is more than two times as great as the Hribar's study. Below in column one of Table 1, are the data points for the 2005-2008 period that can be compared to the third column which are the data points taken from the Hribar et al (2006) study for details on the descriptive statistics. The mean dollar of the purchases of the 2005-2008 period is $351 million, per quarter compared to $34 million for the prior study. This multiple is greater than ten. The median for this study is $110 million compared to $3 million which a 37 multiple.

All of the figures presented in Table 1 for the number of shares repurchased again present factors that are at least 10 times the figures of the prior period. Thus, the average number of shares repurchased in this time is 9 billion per quarter compared to 1 billion for the prior study. The individual years reflect a pattern of rising purchases for each of the individual years of 2005, 2006, 2007 and then a reversal of t in 2008. This is the case for both an analysis of the dollar value of repurchases and then for the number of shares repurchased. It could be justly speculated that the 2008 drop in repurchase activity was due to the Financial Crisis that started in 2007.

On Table 1 the repurchases in this sample as a percent of outstanding shares is also larger. The median here is .92% while it is .59% in the prior study and the average was larger as well 1.41% versus 1.28%. It is 1.83% compared to the 1.53% for the top 75 percentile. This reflects greater magnitude. This is more pronounced when evaluating the individual year of 2007, which has the highest value in all data points concerning shares, repurchases as a percent of beginning shares. In 2007, the mean was 1.71% and the 75% quadrant was 2.17%. This is a moving increase that has its start in 2005 through 2007 then abruptly changes in 2008. However, over all this four-year period still maintains an overall frequency, despite the turn in statistics in 2008.

$H_{2:}$ Buybacks are more frequent for the period of 2005-2007, than the period of Hribar's et al (2006) study of 1988-2001.

Across the board in all categories, the experience of 2005-2007 was greater than 2005-2008 and by association greater than the Hribar et al 2006 studied period. Thus, not only is the frequency more pronounced in this sample period of 2005-2007 but also the dollar amount greater and the intensity of the buybacks effect is stronger.

Table 2 gives some descriptive statistics of repurchasing firms of the samples, we see that when the 2005-2008 and the 2005-2007 periods are compared to the prior study, we visualize different types of firms. This is most evident from the asset section of the statistics. We see a much larger asset base, averaging $26million for the current study and $4billion for the prior study. Sales hold a related relationship to the asset bases and follow in tandem with sales approximating 20% of the asset holdings. In addition, in continuation share price of the current study almost twice of the earlier study; average $47 versus $28, and median of $42 verse $22. What is similar is the cash as a percent of total assets. Cash is available for both studies in the range of 12%-17% as a percentage of assets.

Table 1: Descriptive Statistics for sample of repurchase firms

	2005-2008	2005-2007	1990-2000 (*)
Repurchase activity variables. Dollar Value of Repurchases($M)			
Mean	350.7	369.32	34.31
Std. Dev	844.17	836.47	141.04
25th	27.1	33.1	0.56
Median	109.78	124.06	3.05
75th	320.46	339.83	16.42
Shares Repurchased(M)			
Mean	9.23	9.758	0.87
Std. Dev	22.28	23.848	2.687
25th	0.648	0.712	0.038
Median	2.65	2.788	0.168
75th	7.449	7.693	0.64
Shares repurchased as a percent of Beginning shares outstanding (%)			
Mean	1.41	1.49	1.28
Std. Dev	2.08	2.24	1.99
25th	0.29	0.33	0.18
Median	0.92	0.93	0.59
75th	1.830	1.890	1.530

Note* : Per the statistics reported Hribar et al 2006 study, p10. *The above table summarizes the findings regarding the dollar value of repurchase shares repurchases and share repurchased as a % of beginning shares outstanding. When the two current periods are compared to 1990-2001 the results show a multiple of ten times greater for dollar value and shares and as a % of beginning inventory the current is 1.41% &1.49% compared to 1.28%. This supports greater frequency.*

In both studies, not all buybacks resulted in an accretive EPS. Accretive EPS is that the earnings per share are greater by one penny or more due to the buybacks. Skinner & Sloan (1999) showed that missing the quarterly forecast by $.01 could lead to a dramatic loss in market value. Some buybacks had no effect or a negative if they were offset by issued share which could increase outstanding shares, or that the forgone profit on the cash used to repurchase was too great to offset the denominator effect of the buyback shares. Several reasons were cited in the Hribar et al 2004 (p,17) study " to believe that many of the open-market stock repurchase in their sample are not EPS accretive since 1) the repurchases are relatively small since the median repurchase eliminates less than 1% of the shares outstanding. 2) Second, 12.3% of the quarters studied involved a loss for the current quarter, since a stock repurchase cannot increase the earnings per share of these firms and 3) Third, more that one-quarter involved firms where the P/E exceeds 20 which makes it more difficult for the buybacks to be accretive. The higher the P/E multiple the more difficult for stock repurchases to be accretive (Hribar et al 2004 version p.29). The Hribar et al 2004 study present a model that predicts the accretiveness of buybacks as a function of three factors 1) the size of the buybacks as a percent of shares outstanding, 2) the amount of companies with a loss and 3) as a function of the P/E ratio. Their model holds true for this sample period, however with different results due to a reversal in the conditions one, two and three here mentioned.

H_3: The accretive affects of the buyback are on a larger scale for the period of 2005-2008, than the period of Hribar's et al (2006) study of 1988-2001.

The frequency of buybacks was higher than this hypothesis follows to test the intensity of the effect. This is undertaken with the understanding that not all buybacks are accretive. The purpose here is to measure the magnitude of the effect and compare it to earlier findings. According to the information presented on Hribar et al 2006 (p.12) 4,466 firm quarters or 17.6% of the stock repurchases increased current quarter EPS by one penny. This study finds 1337/3162 or 42% of the stock repurchases increase current quarter EPS by one penny. Again, this is in the line with the other findings, of a dramatic increase.

Also according to the Hribar et al 2006 study, 84.1% of the accretion was by $.01 and $.02, which confine the accretion to a narrow area. According to this study, the results were similar. In 86% of this accretive sample, the confines were also in the $.01 and $.02 range.

Table 2: Descriptive Statistics for Sample of Repurchase Firms

		2005-2008	2005-2007	1988-2000 (*)
Repurchase activity Other Variables				
Sales ($millions)				
	Mean	5,303.8	5,119.9	892.6
	Std. Dev	10,078.8	9,343.0	2,825.8
	Median	2,127.0	2,130.0	159.1
E/P				
	Mean	0.0372	0.0499	0.0474
	Std. Dev	0.2804	0.0897	0.0900
	Median	0.0556	0.0537	0.0557
P/E ratio	for positive earning firms only			
	Mean	24.69	25.57	27.41
	Std. Dev	60.88	61.42	94.36
	Median	17.44	18.23	16.80
Share Price ($)				
	Mean	46.980	48.840	27.640
	Std. Dev	35.770	35.110	23.340
	Median	42.000	44.370	22.130
Assets ($ millions)				
	Mean	26,393.5	26,208.4	4,006.8
	Std. Dev	60,057.7	58,765.5	16,024.7
	Median	9,727.0	9,603.0	586.8
Cash (% of assets)				
	Mean	13.7	12.8	12.4
	Std. Dev	12.7	13.8	16.5
	Median	7.5	7.6	5.0
EPS ($)				
	Mean	0.64	0.70	0.36
	Std. Dev	1.29	0.82	0.54
	Median	0.58	0.59	0.32

(*)Note : Per the statistics reported Hribar et al 2006 study, p10. The above table summarizes some of the descriptive characteristics of the repurchasing firms of the samples. When comparing 2005-2008 and 2005-2007 to 1988-2000, the visual is that the sales, sales price, asset base and EPS are much higher. What is similar is the cash as % of total asset and sales holing in tandem with a 20% of asset base. This sample was the S&P 500 which are large capitalized United States companies, and did not include all other repurchasing firms as Hribar et al (2006) study. The indication is that repurchases are moving mainstream into the large companies.*

The accretive affects are more dramatic since a larger percent that is causing a difference of $.01 or more. This is of interest since if a difference of $.01 is considered as having market effect, then the effect of the buybacks on EPS should be transparent. Thus, here is proposed a new EPS model that allows for the analyzing EPS in a in a segmental fashion. It isolates t he EPS from operations from the EPS from the equity component due to the treasury shares. This is presented and illustrated in the following formula:

$$Yt = Nt / It - ((Nt/ It) - Nt /(It - Tt)) \quad (2)$$

Where
Yt = EPS reported for the current quarter
Nt= net income at present time
It= = issued shares in the present quarter
Tt= treasury shares in the present quarter
For illustration purposes the hypothetical company has the following data.

$Yt = EPS = \$5$
$Nt = net\ income = \$100$
$It = issued\ shares = 25$
$Tt = treasury\ shares = 5$
$Yt = Nt/It - ((Nt/It) - Nt/(It - Tt))$
$\$5 = \$100/25 - ((\$100/25) - \$100/(25-5))$
$\$5 = \$4 - (\$4 - \$5)$
$\$5 = \$4 + 1$ (1)

The value added by segmentalizing the EPS, is that it isolates the earnings from operations, which in this simple example is $4, and to isolate the EPS from the equity component contributed from the treasury shares, which in this illustration is the $1. EPS is the total of $5, which is the sum of the two.

CONCLUDING REMARKS

The goal of this paper is to bring attention the new financial phenomenon of increases in buybacks that are having a more dramatic effect on the accretion of EPS. This study focused on later time period and has found the volume is greater, and that it is affecting EPS on a larger scale. The current EPS model does not reflect this component of EPS. In order for the accounting to keep pace with the financial impact of treasury shares, a new EPS model is proposed to report what portion of EPS is from operations and what portion is from the mechanical effect of the treasury shares when it is applicable. This may be of interest to the accounting community of the FASB and the IASB as their convergence projects seeks to devise an accounting system that reflects the realities of the financial transactions.

The data collected and the methodology for this paper was to replicated part the Hribar et al (2004, revised 2006) study. The period studied here was 2005-2008 compared to 1988-2001. The sample for this study was the S&P 500 companies on a quarterly basis. EPS was recalculated without the buybacks to determine how much they were affecting the EPS. This was done by comparing reported EPS with the recalculated EPS. The results reflect that buyback shares are more commonplace and are escalating their accretive effect on EPS. In conclusion there is statistical support that the model presented by Hribar et al 2004 to explain the lack of frequency for their study of 1988-2001, works in reversal for the 2005-2008 period due to a reversal in financial and economic conditions. Their study found frequency to be weak due to three factors; 1) low number of shares repurchased 2) large number of firms with losses and 3) high P/E. This study finds greater impact given the reversal of the situations where 1) the dollar amount, the number and the percentage was greater. The mean dollar amount , mean number of shares, and shares repurchased as a percent of beginning shares were $350 million, 9.23 million and 1.41% compared to $34 million, .87 million and 1.28% 2) lower number of firms with losses : 5.4% compared to 12.3% and 3) lower P/E multiples: mean P/E of 24.69 compared to 27.41. Also supported was that the accretive affects were more frequent here at 42% compared to 17.6%. However, in both studies the effect of the accretion is in the $.01 -$.02 range for 80% or more of the firms.

One weakness of the paper maybe that it does not entirely replicate the Hribar et al study (2004 revised 2006) ; they studied all firms that had repurchases over $10,000 for a 13 year period, while this study a substantial subsample which is the S&P 500 for a four year period. For future study, an item that has sparked interest, especially since the literature has conflicting findings is in regarding to number of shares outstanding. Are they overall decreasing due to buybacks and what effect is this having on market capitalization?

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AN EMPIRICAL ANALYSIS OF MARKET REACTION TO CORPORATE ACCOUNTING MALFEASANCE

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ABSTRACT

This study examines corporate accounting malfeasance from an exploratory and empirical perspective for 100 companies to determine if there is an association between the Jenkins recommendations and SOX requirements and to determine if there are any differences between the internal and external monitoring characteristics of malfeasance and non-malfeasance companies. The exploratory perspective discusses the types of corporate malfeasance and gives an accounting and market dollar impact ($140 and $857 billion respectively) of 100 companies with publicly announced malfeasance and supports previous studies findings that revenue was the most common area of corporate malfeasance and theft was the least. The empirical study examined internal (corporate governance) and external (auditor and financial analysis) monitoring characteristics by matching the malfeasance companies with non-malfeasance companies. This empirical study did not find any significant differences in the monitoring characteristics of the companies even though these characteristics were chosen based on an examination of recommendations/requirements for business reporting for SOX and several accounting committees over the years. Previous studies indicated a difference.The research contributes to contemporary accounting literature by providing a dollar measurement of the accounting and related market impact for malfeasance companies and a systematic investigation testing monitoring characteristics between malfeasance and non-malfeasance companies.

JEL: -M4, M40, M41, M48, M49.

KEYWORDS: Accounting Restatements, Accounting Malfeasance, Corporate Malfeasance, SOX, Jenkins Report, Jenkins Recommendations.

INTRODUCTION

Announced corporate malfeasance has increased significantly since the mid-1990s resulting in a significant increase in the number of previously issued financial statements having to be restated. This has also resulted in increased dissatisfaction with the current financial reporting process by regulators and investors. Arthur Levitt's speech, The "Numbers Game" in 1998 highlighted the Securities and Exchange Commission's (SEC) discontentment with the volume of corporate malfeasance, emphasized the need for reform in the financial reporting arena and called on the accounting profession to help in the reformation process. The Enron and WorldCom accounting scandals in late 2001 and 2002 refueled the reform issue compelling regulatory and political intervention to change the financial/business reporting process with an implied objective that the reforms would reduce or eliminate corporate malfeasance.

Congress' passage of the Sarbanes-Oxley Act of 2002 (SOX) was a direct response to the accounting scandals and an attempt to reform the financial/business reporting process. But there have been several other efforts during the 20th century to reform or improve the financial reporting process due to misleading or fraudulent financial reporting: the Special Committee on Co-operation with Stock Exchanges of the American Institute of Accountants during the early 1930s (Storey 1964) in response to the stock market crash of 1929; the National Commission on Fraudulent Financial Reporting formed in 1985, chaired by James C. Treadway (the Treadway Commission), (Minter 2002); etc. In 1991 the American Institute of Certified Public Accountants (AICPA) formed the Special Committee on Financial Reporting, later deemed the Jenkins' Committee since it was chaired by Edmund Jenkins, then a partner

in Arthur Andersen. The Jenkins' Committee report, *Improving Business Reporting-A Customer Focus; Meeting the Information Needs of Investors and Creditors* (AICPA 1994), is considered the most comprehensive study on user needs for business reporting information and continues to be utilized today. Several of the Jenkins' Committee recommendations were included in the Enhanced Business Reporting Consortium's (EBRC) proposed business reporting framework (ERBC 2005) and the SOX legislation (SOX 2002). For a better perspective on the history of accounting please see Previs (1997) and Zeff (2003). The Jenkins Committee and EBRC recommendations and SOX requirements all include, in addition to other items, more transparency in business reporting,, more board of director independence and less related party transactions between board members, corporate officers and the corporation (Arnold, 2006). This research seeks to examine the accounting and market impact of corporate malfeasance and to investigate the historical value of these recommendation/requirements' impact on corporate malfeasance.

Since SOX (2002) and EBRC (2005) requirements/proposal resulted from the recent accounting scandals (corporate malfeasance) and mirror several of the Jenkins Committee recommendations, this research project includes an initial study of 100 selected accounting malfeasance companies to determine if the accounting malfeasance announced by several companies could be identified to a Jenkins' Committee recommendation (with dollar impact) and a follow-up empirical study of some of the internal and external monitoring characteristics of these companies and matched non-malfeasance companies.

The next section describes the literature review of malfeasance, restatements and other relevant accounting issues. This is followed by the research data and methodology processes for the initial study sample and date selection and the follow-up matching sample data selection and methodology.. The next section discusses the results of the exploratory and the empirical studies. The last section contains concluding comments.

LITERATURE REVIEW

Identification of corporate malfeasance in this study was obtained through analysis of accounting irregularities or other announced inappropriate financial activity for a company, i.e. bribes. Fraud and accounting errors are included in this operationalization of corporate malfeasance. While it is difficult to interpret whether accounting errors and or misstatements are intentional or unintentional, they exist under management's jurisdiction and as such are management's responsibility. Therefore, these and other accounting irregularities are included as corporate malfeasance for purposes of this discussion. Other studies have addressed this in a similar manner. Dechow and Skinner (2000) made a distinction between fraud and earnings' management. They defined earnings' management as within-GAAP choices that are used to obscure or mask true economic performance (management intent). Whereas, they defined fraud as a clear intent to *deceive* using accounting practices that violate GAAP. Palmrose et al (2002) agreed with their definition of fraud. But, they also maintained that "it is difficult for researchers, regulators and courts to distinguish empirically between unintentional errors, aggressive accounting (resulting in non-GAAP reporting) and fraud." While Dechow and Skinner (2000) define all non-GAAP reporting as fraud, they discussed in their article the difficulty expressed by Palmrose et al.

(2002) of distinguishing intent. Hence, corporate malfeasance in this study contains all accounting irregularities including fraud. This studies approach to examining corporate accounting malfeasance includes accounting errors, accounting misstatements and/or any other accounting irregularity similar to the approach utilized by the GAO (2002) in their study. Here the focus is placed on corporate malfeasance and not fraud to address business reporting concerns. The number of restatement companies and the magnitude of restatement dollars have been increasing significantly since the mid 1990s, whether examining the number of restatements filed or the number of restatements announced. However, the number of SEC public registrants has been decreasing. Wu's (2002) examination indicated that announced restatements increased from 56 in 1994 to 153 in 2001 – a 273% increase. The GAO study

(2002) also reflected a similar growth in announced restatements with 92 announced restatements in 1997 and the volume increasing to 225 in 2001. Huron Consulting (2003) provided data that indicated restatements filed in 2002 (330) increased 285% over the number filed in 1997 (116). Results of these studies and the 1998 Levitt speech denote that the increase in corporate malfeasance reached significance even before the Enron and WorldCom scandals in late 2001. Wu's 2002 study also highlighted this effect as it showed the number of restatements filed, between 1977 and 1997, were small relative to the number of public companies registered with the SEC. Corporate malfeasance usually requires a restatement of previously issued financial statements.

In past studies (Kinney and McDaniel 1989, Feroz et al 1991, Gerety and Lehn 1997), results indicated that restatement companies (1976-1984) were smaller, less profitable and slower growing than their industry or control counterparts etc. However, recent studies (Huron 2003, Wu 2002, Palmrose et al. 2002, etc.) found that trend had changed. As the Huron report (2003) indicated, there had been a shift from small company (less than $100M) to large companies requiring more restatements. Their study revealed that 58%, of the companies filing restatements in 2002, have revenue over $100M and 22% have revenue over $1B. Although most restatements are announced before they are filed, as noted by Wu (2002) the time difference between when a restatement is announced and when it is actually filed can result in a lag of one to eighteen months or longer. However, the volume difference between announced and filed restatements is not just a timing difference as not all announced restatements result in filed restatements. Some companies become delisted or go bankrupt and no filing is required or can be made. As restatements have increased, the SEC Auditing and Accounting Enforcement Releases (AAER) have also risen. Although the increase in the number of AAERs is not proportional to restatements, it is related since an announced or filed restatement can be the result of an AAER or can trigger an SEC investigation that may result in an AAER. But all restatements for accounting irregularities do not have a corresponding AAER. AAERs are issued by the SEC only after an investigation.

SEC investigations are conducted to see if registered companies or persons associated with registered companies have complied with SEC regulations for accounting principles, auditing standards and/or fiduciary responsibilities. Violations of these regulations or other forms of corporate malfeasance result in AAERs. While a company or an individual may receive multiple AAERs as the SEC uncovers different violations, a company may announce or file only one restatement that contains correction of several irregularities (Callen et al 2002). From 1982 to1995 the SEC had issued 675 AAERs to companies and individuals (Bonner et al 1998). As of July 30, 2001, they had issued over 1480 AAERs (SEC 2003). The corresponding number of announced restatements issued during those time periods was 475 and 1208 respectively. However, this includes multiple AAERs for the same restatements and those for individuals associated with other SEC violations. For example, Dechow et al. (1996) noted that 165 of 436 AAERs from 1982-1992 were issued for actions against auditors for violations of auditing standards. In examining AAERs, we found as did Bonner et al. (1998) that AAERs corresponding to the restatement provided a more detailed description of the corporate malfeasance than can be detected from other sources. Note: From July 30, 2001 to January 30, 2006, the number of AAERs issued increased by almost 1000 to over 2300 (SEC, 2006). As malfeasance increased, so has the impact on market value of the related companies. Buckster (1999) pointed out that $31B in market value was lost from January 1997 to January 1998 due to corporate malfeasance. Our initial study indicated almost a trillion dollar impact for 100 companies. Most market studies use a 1 to 3 day window for market reaction (Wu 2002, Palmrose et al 2002, etc.). GAO analyzed a market impact using a 1 day window and a 30 day window before and after the announcement date (GAO 2002). As noted by Wu (2002) the market starts to exhibit the decline ahead of the announcements'. Possible explanations provided are that early warnings, missing analysis forecast, or SEC formal or informal investigation, could precede restatement announcement.

Studies (Wu 2002; Palmrose et al 2002; and Dechow et al 1996) found that the most significant decline of value is during the initial announcement windows. Dechow et al. (1996) found that the average

stock price dropped approximately 9% at the initial announcement of alleged earnings manipulation. Although Palmrose et al. (2002) used a 2 day window to test market reaction and sample of announced restatement companies from 1994-1999, and Wu (2002) used a 3 day window for companies that announced restatements from 1977-2Q2002, similar results were observed. Both studies found that the market reacts to some measure of materiality, and there is a penalty or punishment for the company when no dollar amounts are given with the announcement. We used a 6 month window for our study.

Market reaction noted by Palmrose et al (2002), commented that "substantial portion" of the restatements examined (1995-1999) were due to in process research and development (IPR&D), but there was only mild market reaction to these restatements. While IPR&D was a major restatement item for companies 1999 and prior Palmrose 2003), Huron (2003) found that only 3 of 833 restatements filed from 2000 through 2002 reflected IPR&D as an explanation for restatements. (Additional guidance on IPR&D was provided in 2000 by the AICPA in the form of a practice aid.)

With the accounting scandals of the late 20th and early 21st centuries, public interrogations continue - where was the board? Where were the auditors? In some cases of malfeasance, the answer resonates: they (the board and the auditors) were there, but they were part of the problem (SEC AAER 1996-2003). Beasley (1996) and Abbott et al. (2000) had conflicting results regarding characteristics of the board of directors and their relationship to financial misstatements. Characteristics examined included independence, director tenure, shareholdings, etc. Beasley found these characteristics were related to financial misstatements and Abbott et al. (2000) found that they were not. Gordon and Henry (2004) found a negative relationship between industry-adjusted returns and related party transactions, which supports the perceived conflict of interest between the management board/ and the shareholders.

Other studies (Farber 2005, Frankel et al 2005, etc.) have also examined the association between fraud and various components of corporate governance addressing board independence, audit committee make-up and the auditor type (Big 4 or other). Frankel et al (2005) found that in the year prior to the announced fraud, consistent with prior research, that the fraud firms had poor governance relative to his control sample. Dunn (2004) also had similar results. Frankel et al (2005) also found that board independence shapes the quality of earnings. We also tested our initial sample of malfeasance companies with matched non-malfeasance companies for similar associations. Farber (2005) examined companies from 1982-2000 and Frankel et al (2005) examined companies from 1988-2002, while our study examined companies from 1996-2002. Other interesting work on the topic of malfeasance and restatements include Lynch and Gomaa (2002) discussion on technology and fraud using Ajzen's theory of planned behavior (1985) and Kohlberg's theory of moral reasoning (1981). The behavior for this type of fraud may or may not involve financial reporting, but it is the type of analysis used to determine if separation of duties, job rotation, time off from job, and or business reporting, etc. will be useful as a control to prevent or detect fraud in this area. However, this paper addresses whether or not business reporting, as suggested by Jenkins, would have reduced the opportunity or exposed the malfeasance.

Gillett and Uddin's (2005) study of CFO intent found CFOs of large companies were more likely to commit fraud than CFOs of smaller companies.While the intent of the Jenkins Committee recommendations (AICPA 1994) was not to address fraud directly, but to address the underlying concept of accounting as relevant, reliable, and timely business reporting. They focused on making the company more transparent through disclosures and had two major categories of recommendations, 1) Improving the type of information in business reporting (comprehensive model) and 2) Improving the financial statements and related disclosure. Further analysis of the detailed requirement of their comprehensive business reporting model indicated that significant disclosure is also required in those recommendations also. Several of these recommendations were user driven. Users were concerned about the relationship between management, shareholders, directors and auditors. Users wanted any transactions or relationship issues among major shareholders, directors, management, suppliers, customers, competitors and the

company to be disclosed. One of the Jenkins' model element requests that "information about management and shareholders," include the disclosure of the nature of any disagreements between management and directors, independent auditors, bankers, and lead council that are no longer affiliated with the company. Disagreements could point out additional items that the company did not disclose, that the disagreeing party thought should have been disclosed. Regardless of the resolution of the disagreement, information regarding the disagreement would make the company more transparent to users. Auditor disagreements should be documented in the auditor's work papers and resolved to the auditor's satisfaction before the audit report is issued.

If not, the disagreement may impact the type of audit report issued by the auditors, depending on the nature and extent of the disagreement. In some cases, auditor disagreements will cause management to change auditors. In these cases, where disagreements result in management firing the auditor or the auditor resigning, the reason for the auditor change has to be provided to the SEC. Changing auditors is not something that is done lightly since it must be reported. While there are many good reasons for changing auditors (upgrading to a bigger audit firm, changing to an industry specialty firm, etc.) changing due to disagreement over accounting practices or reporting requirements is not that common since most disagreements are resolved between auditor and management or directors. Changing auditors is an expensive process for the company and for the audit firm. There are significant start-up costs on both sides when new auditors are engaged. While it has been discussed that usually the initial fee for audit engagements may be low to get the audit client, ("low balling") that is not the focus of this paper. Here the focus is on whether or not an auditor change occurred for a malfeasance company during the 5 years prior to the announced malfeasance. Then, the reason for the change will be determined, if the information is accessible. Since the Jenkins' report (AICPA 1994) was published, there have been some actions taken to strengthen the board of directors from the shareholder's perspective, such as the requirements from the Blue Ribbon Committee. Interestingly, Jonas and Blanchet (2000) were concerned about the Jenkins' Committee and recommendations from other committees.

Their concern was that recommendations were either user needs motivated (the focus of the Jenkins' recommendations, the FASB Conceptual Model and the Earnings persistence Model) or shareholder/investor protection motivated (the focus of the Kirk recommendations, SEC, Blue Ribbon recommendation #8 and SAS 61.) They maintained that quality financial reporting should encompass both user needs and investor protection.The Jenkins Committee did not address other services or specific issues relating to the auditor's association with the company as does SOX (2005). However, Kinney et al. (2003) found that there did not appear to be evidence to support that audits were less independent due to performance of other services. Kinney et al. (2003) they did find some positive association between "other services and restatements. As in previous studies, the quality of the audit was also an issue. Therefore, Big 4 or non-big 4 auditor differences were tested.

DATA AND METHODOLOGY

In order to assess whether or not the Jenkins Committee recommendations (AICPA 1994) would have an impact on corporate malfeasance, this study focused on 100 companies to 1) validate previous conclusions, 2) determine what additional conclusions could be made, and 3) evaluate the relationship of the Jenkins' recommendations to the accounting irregularity. A small sample of 100 companies was selected to address Dechow and Skinner's (2000) concern that academics' samples are usually too large and too general to show an impact on investors.The 100 malfeasance companies were selected based on publicized malfeasance over the late 2001 to early 2003 time period, and prior related companies discussed in the announcement articles for the selected companies. Forty-nine of the companies were selected from Rutgers University's "Cooking The Books" seminar. In addition, the 16 companies with detailed history were selected from the GAO report (2002), and the balance of the companies was then selected from the SEC AAERs (2002-2003). These companies were selected from these sources without

regard to size, auditor, malfeasance activity or other criteria other than an announced accounting malfeasance event as discussed above to ensure the group would be diverse. Sources, of the accounting irregularity and for the details of the accounting irregularity, were taken from various business news articles and regulatory filings. These media were examined to obtain as much detail as possible regarding the malfeasance, the dollar impact of the malfeasance, the financial statement account(s) impacted and the earliest announced date of the irregularity. In some cases, multiple accounting irregularities were described for a company.

In addition the announcement date of the corporate malfeasance activity for each company was used to obtain stock price information to determine the market impact of the stock price change for each company where possible. The primary difference, between this and other studies, is the association of the dollar impact of the accounting irregularity with the market impact and the cataloging of the malfeasance items according to Jenkins' recommendations. The objective was to see it were possible to associate a dollar value of corporate malfeasance with specific Jenkins' recommendations for business reporting. Since a direct connection to the malfeasance activity and the recommendations were not made, the Jenkins recommendations were summarized in two major categories as noted in the study results. The rest of this section discusses initial sample selection and other data used to determine the accounting and market impact and methodology. This is followed by the matching sample and data selection and methodology.

Detailed standard industry classification indicated that the initial companies were in the following industries: 29 manufacturing; 25 services, 14 transportation and public utilities; 12 retail trade; 11 finance, insurance or real estate; 5 wholesale trade; 2 mining, 1 agriculture and 1 company not classified due to the fact that it was closely held.. Descriptive financial information is in table 1 and malfeasance information is included in tables 2 for these companies. As included in table 2, there were 180 observations of malfeasance activity for the 100 companies selected. Fifty one of the malfeasance companies were listed as fortune 500 companies at the time of the malfeasance activity according to COMPUSTAT. Fifty-three of the 100 companies included in this study were also included in the GAO study (GAO 2002). In addition, 61 of the companies had been issued at least one Accounting and Auditing Enforcement Release by the SEC (SEC 2005) with 43 of the malfeasance companies being included in both the GAO study and the SEC AAER database. There were 20 companies included in this study that were not in the GAO study nor at the time of this dissertation, had been issued an AAER.

Table 1: Financial Summary Description of Malfeasance Companies ($ in billions)

	N	Minimum	Maximum	Mean	Std. Deviation
TotAsst	99	0.016	902.21	29.989	100.63
Sales	99	0.001	11.183	13.470	22.090
NetInc	99	-13.356	13.519	0.1702	2.955.8
Valid N (listwise)	99				

This table shows the summary statistics for 99 of the 100 companies. The data includes total assets, total nets sales and net income. (One of the companies in the sample was closely held and we could not obtain this detailed information.)

The details of the accounting irregularity was further reviewed and categorized according to a detailed accounting taxonomy (Appendix A). This taxonomy was based on the taxonomies from other studies (Bonner et al 1998, Wu 2002 and Huron 2003), but modified for this study. The accounting taxonomy classified the malfeasance activity of the 100 companies into 5 major categories as they related to the company's financial statements and/or type of fraud: 1) Revenue; 2) Expense; 3) Income Inflation (including asset and liabilities impacts); 4) Theft-misappropriations (endogenous); and, 5) Exogenous (bribes, insider trading, etc.). Each of the major categories further segregated the malfeasance activity according to type. These categories were used to group the accounting and market dollar impacts (results

of this analysis are summarized in table 3 and table 5) and discussed in the accounting and market assertions/results. Two coders were used to categorize the details of the accounting malfeasance and in cases where there were differences; a third coder was used to determine the applicable taxonomy category.

Table 2: Malfeasance by Announcement Year for Firms ($ in billions)

	Number Firms	Number Observations	Dollar ($) Amount	Observation Mean by firm	Firm Dollar Mean
1997	6	14	1.159	2.33	0.193
1998	8	23	2.954	2.88	0.369
1999	11	17	4.190	1.55	0.381
2000	8	19	4.692	2.38	0.587
2001	18	32	6.388	1.78	0.355
2002	45	70	119.75	1.56	2.661
2003	4	5	1.232	1.25	0.308
Total	**100**	**180**	**140.37**	**1.80**	**1.403**

*This table shows the number of firms in the study and the number of malfeasance observations for these firms by announcement year. It includes dollars amount (accounting impact) of the observations for the firms by year. The observation mean is the number of observations divided by the number of firms by year. The firm dollar mean is the dollar amount divided by the number of firms by year. *Some firms had multiple observations therefore the means will not total.*

The earliest located public announcement date of the malfeasance was also used to assess market reaction. In most cases, the earliest announcement date was taken from the business article. For two companies, the announcement date was taken from the GAO report and for one company from the SEC AAER. To ensure the decline for the market reaction was captured in this study, the announcement date was used as day zero and we retrieved the common stock price for the announcement date, 3 months prior to the announcement date and 3 months subsequent to the announcement date for each company. (If the calculated date was on Saturday, the previous Friday's stock price was used and if it was on Sunday, the following Monday's stock price was used.) The S&P 500 price for each day was also obtained and each company's stock price was indexed using the S&P 500 price. The company stock price was taken from yahoo finance (http://finance.yahoo.com) and the S&P Daily Stock Price Record for each stock exchange for the appropriate time period.

The volume for common stock outstanding, for each company, was taken from the SEC form 10K or Daily Stock Price Record for the stock price announcement window chosen. From the historical analysis of Jenkins' Committee recommendations (AICPA 1994) and the exploratory study above, identification was made although indirectly, of the Jenkins' recommendations that addressed the types of accounting malfeasance in this study's selected sample. The identified Jenkins' recommendations include: events related to off-balance sheet and other innovative financial arrangement; director and management information; business segment reporting and unconsolidated entities. (10% of the malfeasance companies had accounting irregularities that included related party transactions and compensation issues involving management and directors.) These items were also included in either SOX (2002) or EBRC (2005) requirements/proposals. Since the Jenkins' recommendations were not implemented, this study continued by testing characteristics of the malfeasance companies that related to a Jenkins' recommendation, SOX (2002) requirement, or EBRC (2005) proposed framework: more disclosure, more board independence, and less related party transactions between board members, officers and the corporation. Secondly, corporate governance, auditor characteristics and a financial condition proxy were examined comparing each malfeasance company selected for our initial study to a matched non-malfeasance company and tested using a logistic regression. This follow-up study examined corporate governance as an internal monitoring tool; and, the financial analysis and auditor characteristics as an external monitor tool.

The following five hypotheses were utilized during this follow-up study to address the internal monitoring activities of the companies:

H1: Company malfeasance is positively associated with board size (the number of directors on the board).

H2: Company malfeasance is negatively associated with the number of independent directors on the board.

H3: Company malfeasance is negatively associated with the number of independent directors on the audit committee.

H4: Company malfeasance is positively associated with staggered terms of the directors on the board.

H5: Company malfeasance is positively associated with the number of officer/or director related party transactions

To examine the external monitoring activities of the companies we test auditor quality and change and financial leverage. Concerns regarding the quality of the audit (whether or not the audit was performed by a "Big 4" auditor or not) and whether or not there was a change in auditors following the malfeasance was also examined utilizing the following two:

H6: Company malfeasance is negatively associated with the brand of the auditor (Big 5 or non-big 5)

H7: Company malfeasance is positively associated with auditor change in the five years prior to the announced malfeasance.

Malfeasance companies were not expected to be highly leveraged due to utilization of the appearance of a "healthy" financial position to continue to obtain cash from investors through the market. Therefore it is contended that malfeasance companies, are not any more leveraged than other companies (due to their malfeasance), but may not have as much cash or cash equivalent assets as non-malfeasance companies. We use hypothesis 8 to test this contention.

H8: Company malfeasance is negatively associated with firm leverage.

For the follow-up study, an attempt was made to match each malfeasance company from the initial study with a non-malfeasance company based on the malfeasance company's 4-digit SIC and size (total assets). Since one of the companies was a closely held corporation and detailed financial information was not available, it was excluded from the follow-up study. .For the remaining 99 malfeasance companies COMPUSTAT Research Insight was used to gather this historical data. Initially, the 4-digit SIC was used for the sample companies to retrieve the total assets for all companies with the specified SIC.. In most cases the number of companies retrieved for a specified SIC was too large to easily isolate a match, therefore, a range based on the sample company's size (total assets) was used to narrow the company volume for that 4-digit SIC. If no comparable size company was found in the 4-digit group, then the SIC code was narrowed to 3 digits, then 2 digits, then 1 digit or finally for 3 companies; they were matched simply on size as the remaining non-malfeasance companies in their SIC (even one digit) were too small.

After a comparable match was determined, the matched companies were each checked for malfeasance using the same sources used for the sampled companies, news media, professional/business journals and publications, google.com and yahoo.com as well as the GAO study and SEC AAERs. After the initial match, 15 of the 98 non-malfeasance companies were eliminated (due to malfeasance) and the matching process repeated to select another non-malfeasance company. After the date of the initial matching process, several other companies (5) deemed to be non-malfeasance companies committed some type of accounting malfeasance and were replaced by repeating the matching process. Therefore, the matching non-malfeasance sample had a cut-off of no known malfeasance as of May 2005.

Proxy statements were examined to ensure they included director information. When the proxy statements were not available, the 10K director information was used. For foreign companies listed in the U.S., the 20-F required by the SEC was used. In cases where the data from a wholly owned subsidiary was used, the proxy for the parent company was employed to capture the director information.

No SEC filings or information could be located for three matched companies' board of directors. These were foreign companies who apparently did not file any reports with the SEC. There were no indications that a 20-F, 10K, or even a Williams Report had been filed in the last 10 years. COMPUSTAT did however have financial data for these companies. To keep the matching as similar as possible, these companies were replaced in both the financial analysis and corporate governance section with 3 other companies using the matching process described above. In addition, 2 other matching companies were replaced during the proxy search due to malfeasance activity by their parent company and in one instance, the company had recently changed its name, seemingly due to an accounting malfeasance issue under its previous name. The announcement date, for the selected malfeasance sample, was used as the focal point not only for the initial study, but also for the follow-up study data retrieval for the testing of malfeasance characteristics. The company's annual financial data in the year prior to the announcement was utilized for analysis in this study. For example, if the malfeasance announcement was made in 2002, then data for the year 2001 was used. Financial statement data for each malfeasance company (the sample) was taken from COMPUSTAT data using the Wharton Research Database System (WRDS) based for the year prior to the announcement date. However for 3 of the sample companies, no data was available in the year prior to the announcement, so data for the previous prior year prior was used, i.e., announcement year minus two. This approach (announcement year minus one) was also applied to the selection of the non-malfeasance firms for hypotheses testing.

The characteristics tested for internal monitoring were the size of each company's board of director; the number of independent directors on the board; whether or not the audit committee was independent; the terms (staggered or same) for the board of directors; and the existence of more than one related party transaction (directors or officers). The characteristics tested for external monitoring were the brand of auditor (Big 4 or other) and auditor change in the last five years. An examination was conducted of the company's financial position by examining the firms leverage – total liabilities to total assets. It was hypothesized that malfeasance would be positively associated with board size, classified (staggered) board terms, related party transactions and auditor change and negatively associated with board independence, independent audit committees, auditor brand and leverage.

RESULTS

Classification of the malfeasance activity of the 100 companies resulted in a total of 180 accounting items for the 100 companies with an accounting impact of $140 billion (tables 2 & 3). The reported malfeasance was further categorized in this study according to the Jenkins' recommendations referring to the reporting model and the recommendation referring to disclosures (Jenkins' chapter 5 & 6 – AICPA 1994). Although not able to directly link each malfeasance event with a Jenkins recommendation (26 of 180 events/activity or 14% were directly linked), there was an indirect link with each item. This resulted in the total accounting dollars ($140B) related to malfeasance events and activities being allocated between the two major recommendation categories with $122B (87%) to the first category, "Improving the Type of Information in Business Reporting (comprehensive model) and $18B (13%) to the second category, Improving the Financial Statements and Related Disclosure. However, there is overlapping of the dollars and the recommendations since both of these recommendations focus on making the company more transparent through disclosures.

We developed a taxonomy (Appendix A)based on the taxonomies from other studies (Bonner et al 1998, Wu 2002 and Huron 2003), but modified for this study. The accounting taxonomy classified the

malfeasance activity of the 100 companies into 5 major categories as they related to the company's financial statements and/or type of fraud: 1) Revenue; 2) Expense; 3) Income Inflation (including asset and liabilities impacts); 4) Theft-misappropriations (endogenous); and, 5) Exogenous (bribes, insider trading, etc.). The income inflation category was further expanded to capture Inflated Income, Overstated Assets and Non-disclosure/Understated Liabilities. The accounting taxonomy (appendix A) breakout of the $140.4 billion malfeasance (accounting irregularities) indicated that $53.20B (38%) was Revenue related; $7.50B (5%) was Expense related; $16.10B (11%) was Income related; $62.60B (45%) was Assets or Liabilities related; $0.04B (.03%) was Theft and $1B (.7% was Exogenous).

Table 3: Malfeasance Taxonomy Classification ($ in billions)

	Number Firms	Number Observations	Dollars Amount	Firm Dollar Mean	Observation Dollar Mean
1- Revenue	48	67	53.174	1.108	0.794
2 - Expense/Cost	27	27	7.468	0.277	0.277
3-A Income	33	39	16.109	0.488	0.413
3-B Asset	12	15	54.438	4.537	3.629
3-C Liabilities	12	14	8.133	0.678	0.581
4 - Theft	4	4	0.042	0.011	0.011
5 - Exogenous	13	14	1.008	0.078	0.072
Total	100	180	140.37	1.403	0.794

*This table shows the number of firms in the study and the number of malfeasance observations for these firms by malfeasance type using our taxonomy in appendix A. It includes the dollars amount (accounting impact) of the observations for the firms' observations and the firm mean (dollar amount / number of firms) and the observation mean (dollar amount / number of observations) by malfeasance type. *Some firms had multiple observations therefore the means will not total.*

A more specific and direct connection of the accounting malfeasance event(s) of the 100 companies selected to the Jenkins' recommendations indicated that: 15 had malfeasance involving off-balance sheet financing and innovative financial instruments; 10 had malfeasance involving executive management and director information; and, 1 company's malfeasance activity included a one-time gain on the sale of real-estate as continuing operating income. Other malfeasance activity did not readily lend itself to association with a specific recommendation from the Jenkins' Committee. Therefore, the rest of the results focused on validating previous accounting and market impact conclusions, assessing additional conclusions and examining other information such as, corporate governance, auditor information, and the overall financial condition of the company later comparing malfeasance and non-malfeasance companies.

The summarized accounting impact was $140 billion (tables 2 & 3), but the market impact, using a 6 month window, for 96 of the 100 firms was over $857 billion (table 4). Results of this initial study were similar to other studies and also revealed some differences during examination of the Jenkins recommendations categorization. Similarities included that: The majority of the restatements due to accounting irregularities (over 95%) reduced earnings for the restating company; Revenue recognition was the most common form of corporate malfeasance; loss of market value is significantly greater than the magnitude of the accounting dollar loss; actual theft or physical loss is the least of corporate malfeasance items; and the growth in the dollar magnitude of the loss/restatement from initial announcement to final restatement increased significantly; Restatements, particularly those related to the "Big Bath" concept, will result in an increase in earnings if restated for the current period in some cases. For example, correction of misstatements that previously created "reserve" earnings for a future period ("cookie jar" reserves) will increase earnings in the current period. Results also indicated that several of the malfeasance companies had undisclosed liabilities, special purpose entities or other off-balance sheet arrangements that should have been included on the face of the balance sheet as a liability. It was noted that 15% of the companies had violations in this area with the bulk of the problem relating to special purpose entities (SPEs) cited the most often. Listed below are conclusions from this research and related prior studies, and/or ongoing work on the assertions.

Assertion #1: Most of the malfeasance occurred in the revenue and revenue recognition area (49 of the 100 companies had revenue as an impacted account).

GAO (2002) results indicate that 39**%** of the restatements included revenue recognition. Palmrose and Bonner's (1998) findings also showed that revenue was the most common variety of fraud. Palmrose and Scholz (2002) also found that revenue misstatements are the most frequent reason for restatement (37%) and their evidence indicated that revenue restatements are associated with significantly higher payments by defendants. The SEC issued Staff Accounting Bulletin 101 in 1999 to provide further guidance on Revenue Recognition. Both the FASB and the IASB have revenue recognition projects underway. But as the Jenkins' Committee (1994) and others have reiterated, more information, beyond GAAP revenue, is needed to help project future earnings and cash flows.

Assertion #2: Actual dollar adjustments for malfeasance restatements are often significantly larger than initially announced.

The dollar magnitude, of the final restatement actually filed, is usually larger than the initial or other (sometimes several announcements before restatement) prior announced restatement dollars for accounting irregularity. (i.e. WorldCom accounting dollar concerns grew from the initially announced $2.9B to a possible net income overstatement of over $11B in improper bookings). Once a restatement is required, companies often use this opportunity to more closely examine their accounting records and processes. Swieringa (1984) and Levitt (1998) considered this phenomenon as "accounting magic" and "big bath" respectively. The dollar amount of a restatement grows larger as more items arc revealed that will require restatement. Again, it is difficult to determine what was accounting malfeasance and/or what was an unintentional mistake. Most of the accounting entries included in a "Big Bath" can be done in accordance with GAAP since GAAP requires that estimated costs (current and future) associated with restructuring be charged against income in the year in which the decision to restructure is made (Swieringa (1984). This was also seen in several studies even during profitable years as companies smoothed earnings. Other examples of increasing the final restatement include:

a. Although the initially announced restatement may have been due to revenue overstatement, the final restatement may include increases in expenses for the restatement period thereby further reducing income.
b. Large expenses are sometimes set aside into 'restructuring' reserves reducing income. Later these reserves are deemed excessive and returned to the income statement thereby increasing income for the then current period.
c. Asset write-downs or write off (asset cumulative impairment) are also common during this time.

Assertion #3: Theft is the least likely malfeasance item for restatements in most large public ***companies.*** Out of the estimated $140.4B accounting dollars related to the malfeasance for the 100 companies studied, only $0.4B (less than .5%) was attributable to direct theft. The evidence indicates that it's not about stealing; it's about manipulating the books or creating opportunity for manipulation of the market price. The preponderance of this type of white-collar fraud occurs in the manipulation of accounting dollars to obtain market reaction/value. Additional fraud occurs through the misappropriation of assets (e.g. purchase art for CEO) or incurrence of liabilities (e.g. guarantee loan) on behalf of officers or directors of the company.

The CFE Report (2002) noted that over 80% of occupational fraud involved asset misappropriation, 13% were corruption schemes, and 5% were fraudulent statements. The results of this study showed that the smaller the company, the greater the median loss. This concurs with this study's results that actual theft is usually not material relative to the size of most public companies and therefore not usually cited as the reason for restatement.

Results (Table 4) indicate that there was an overall market impact of $857B ($655B indexed to S&P 500) for 96 of the 100 companies in the initial study. It was also found, as did other studies (Palmrose et al 2003, GAO 2002 and Wu 2002), that there was a more negative market reaction to restatements involving revenue recognition than any other type.

Table 4: Stock Price Change and Market Impact ($ in billions)

	[a]N	Minimum	Maximum	Sum	Mean	Std. Deviation
prminus3	96	0.0011	0.1695	3.0389	0.0317	0.0246
AnnPrice	96	0.0001	0.1029	2.1816	0.0227	0.0199
Prplus3	96	0.0001	0.0845	1.6227	0.0169	0.0160
Gainloss	96	-0.1285	0.0045	-1.4162	-0.0148	0.0176
Gnlsperc	96	-0.0010	0.0025	-0.0464	-0.0004	0.0005
Sp500chg	96	-0.0003	0.0030	-0.0018	-.00002	0.0003
InX% chg	96	-0.0727	0.0198	-0.1385	-0.0014	0.0077
InXPrChg	96	-0.1354	0.0083	-1.2411	-0.0129	0.0181
Numshrs	96	0.0060	7.3240	58.606	0.6105	1.1053
Mktgnlos	96	-80.845	7.3541	-601.15	-6.2620	13.635
absMktgl	96	0.0027	80.845	655.42	6.8273	13.358
GrossMkt	96	-104.224	3.5825	-857.41	-8.9314	17.775

This table provides the statistics for the stock prices of the firms, and indicates the market dollar impact for these firms as a result of the change in stock prices using the 3 months before and the 3 months after firm stock price relative to the malfeasance announcement date. The change in individual stock price was indexed to the S&P 500 for that time period to control for overall market change. prminus3 = Stock price minus 3 months AnnPrice = Stock price announcement date prplus3 = Stock price minus 3 months S&P500 market change (index) gainloss = Price gain or loss $ from -3 months to +3 months gnlsperc = Price gain or loss percent sp500chg = S&P500 market $ change (index) InX% chg = S&P500 market % change (index) InXPrChg = Price change indexed using S&P market change Numshrs = Number of shares (in billions) Mktgnlos = Market gain or loss - in billions (InXPrChg times Numshrs) absMktgl = Absolute value of indexed market gain or loss -in billions GrossMkt = The dollar market impact of the 6 month change without indexing (gainloss times Numshrs) [a] Stock prices for 4 of the 100 companies in the original study were not available due to 2 of the companies being closely held corporation and the other two companies stock prices not listed in daily stock records for the time period needed.

Assertion #4: The loss of market value of a company due to malfeasance allegations is significantly higher than the accounting value of the direct effects on the financial statements. Adjusted market value change is about 20 times larger than net income effect.

While the approximately 20 multiplier mirrors the P/E ratio, the results are more direct and broadly reflective than the PE ratio (Table 5). Although the accounting dollar amounts may not have been provided in the initial announcement of restatement/malfeasance, the news itself, that the dollars would have to be restated and/or an investigation (internally or SEC), was enough to cause a reaction in the market. The market reaction is more pronounced if the announcement mentions an effect on revenue or net income.

Table 5: Accounting/Market Dollar Relationships ($ in billions)

Market Impact	Gross (GrossMkt)	Indexed (absMktgl)
Total Market - 96 Firms	$857.41	$655.42
Market Mean (96 Firms)	$ 8.931	$ 6.828
Accounting Impact/Market	**Gross**	**Indexed**
Accounting Total/ Market Total	0.1637	0.2142
Revenue/ Market	0.0620	0.0811
Expense/ Market	0.0087	0.0114
Income/Market	0.0188	0.0246
Asset & Liabilities/Market	0.0730	0.0955
Theft /Market	0.0000	0.0000
Exogenous /Market	0.0012	0.0015

This table indicates the relationship of the accounting dollars to the market impact. It shows the effect of dividing the accounting dollar impact (table 3) using the malfeasance taxonomy categories develop for the study by the total market dollar impact (table 4) sum for the gross and indexed amount. The total accounting to market impact is approximately 20% which is usually similar to the Price/earnings ratio.

Assertion #5: The market reacts more to changes in values that are presented/disclosed in the financial statements than to missing items/events that should have been included or disclosed. While there has been much discussion about disclosure, the malfeasant sample seems to indicate much larger effects in account over/under statement than the known absence of disclosure (information that should have been included in the financial statements). Dollars related to actual accounting errors, erroneous accounting activity, or questionable use of GAAP which impacted the accuracy and/or reliability of the financial statements were more common in the 100 malfeasance companies selected for this study. Items requiring disclosure had fewer dollars which could be indicative of the lack of information available to determine a more accurate impact. However additional disclosure on inaccurate accounting information for malfeasance companies would also be inaccurate and therefore not useful for decision making.

The results from our examination of internal and external monitoring of malfeasance and non-malfeasance companies to see if there was any difference in the control variables were not conclusive. The dependent variable in this study is a dichotomous variable: either the company has malfeasance or it does not. Therefore, logistic regression was used for the testing. But, the resulting regression only had an adjusted R-square of .02. The only significant variable in the correlation matrix was company size as expected since this was one of the parameters for matching. Regression equation:

$Y = 0 + .117X_1 + .072X_2 + .323X_3 - .018X_4 + .057X_5 + .165X_6 - .129X_7 - .203X_8 - .049X_9$
Where:

X_1 = lev = debt amount and debt to equity ratio	**X_2 = bdsize = board size**
X_3 = bdind = board member independence	X_4 = stag = staggered board
X_5 = bdtrans = board member related party transactions	X_6 = auditor = brand name auditor
X_7 = audchang = auditor change	X_8 = cosize = company size
X_9 = audind2 = audit committee independence	

No correlation was found in this study between board independence, auditor type and corporate malfeasance. The test of the control variables (above) shows no statistical difference between malfeasance and non-malfeasance firms (R-square of .065, adjusted R-square of .02). Although results differ for this research than previous studies (Farber 2005, Frankel et al 2005, etc.), it may be due to the years included in these studies. Although results differ for this research, it may be due to the years included in these studies. Farber (2005) examined companies from 1982-2000, Dunn (2004) examined companies from 1992-1996, and Frankel et al (2005) examined companies from 1988-2002, whereas this study examined companies from 1996-2002. The recommendation of the Blue Ribbon Committee (1999) influenced the make-up of the board of directors and board committees. Results of this research did not show any statistical difference except for auditor change. Since several of the auditor changes were from Arthur Andersen LLP to another audit firm in 2002, this pinpoints further examination in a future study.

CONCLUDING COMMENTS

Our intent in this paper was to examine 100 companies with announced accounting malfeasance to determine if the accounting irregularities resulting in the accounting malfeasance could be identified to a Jenkins' Committee recommendation (AICPA 1994) and provide a dollar accounting and market impact. We also wanted to conduct a follow-up empirical study of some of the internal and external monitoring characteristics of the malfeasance companies and a matched non-malfeasance company to determine if there was a difference between the companies. Overall, these studies sought to examine corporate malfeasance and some of the business reporting elements as recommended by Jenkins' or required by SOX (2002) and the level of the corporate accounting malfeasance experienced in today's society. It is acknowledged that this is difficult, if not impossible to determine, therefore this paper identifies and quantifies accounting malfeasance activity and the resulting market impact and associates the activity with the Jenkins' recommendations/SOX requirement where possible.

For purposes of these studies, we defined corporate accounting malfeasance as the use of false or

misleading accounting information or omission of these entries in the financial reporting process (announcements, filings, etc.) that later requires a restatement. This approach to restatements includes accounting errors, accounting misstatements and/or any other accounting irregularity similar to the approach utilized by the United States General Accounting Office (GAO) in their restatement study (GAO 2002). 100 companies were selected with publically announced accounting malfeasance. The descriptive information regarding the type of malfeasance and the related dollar impact was obtained from various public mediums for the 100 companies and categorized into accounting categories based on our developed taxonomy (Appendix A) and Jenkins' recommendations (AICPA 1994). The stock prices were also obtained using a 6 month window for 96 of the 100 companies. The stock prices were indexed to the S&P 500 to control for overall market noise. Data was not available for the 4 other companies.

Results of the initial study indicated that there were 180 accounting malfeasance observations for the 100 companies with an accounting impact (table 3) of over $140 billion (overlapping) and a market impact (table 4) of over $857 billion using the 6 months window for 96 of the 100 companies. Tables 2, 3, 4 and 5 summarize the dollar impact of the observation association with Jenkins' recommendations and the accounting and market outcomes. Summarization of the findings were similar to other studies in that revenue recognition was the most common form of corporate malfeasance; loss of market value is significantly greater than the magnitude of the accounting dollar loss; actual theft or physical loss is the least of corporate malfeasance items; and, the growth in the dollar magnitude of the restatement from initial announcement to final restatement ("Big Bath" or "Cookie Jar").

For the empirical study testing internal and external monitoring characteristics, each malfeasance company (from the initial study) was matched with a comparable non-malfeasance company based on their standard industry classification (SIC) code and size (total assets). Data was not available for two of the companies so only 98 companies were matched for the monitoring study. The 4 digit SIC code was used where possible, the 3 digit, and so-on until all included companies were matched. For the final phase, financial and corporate governance data for the sampled and matched companies were extracted and tested to determine if there was a statistical difference in the characteristics between malfeasance and non-malfeasance companies as the changes in business reporting recommendations and SOX requirements implied. Financial and auditor data, for these companies, was retrieved from COMPUSTAT and the corporate governance data were extracted from the proxy statement or 10-K for each company.

The characteristics used in the empirical study to test for internal monitoring consisted of the size of each company's board of director; the number of independent directors on the board; whether or not the audit committee was independent; the terms (staggered or same) for the board of directors; and the existence of more than one related party transactions (directors or officers). The characteristics tested for external monitoring were the brand of auditor (Big 4 or other) and auditor change in the last five years. The company's financial position was examined by carefully scrutinizing the firms leverage – total liabilities to total assets. It was hypothesized that accounting malfeasance would be positively associated with board size, classified (staggered) board terms, related party transactions and auditor change; and, accounting malfeasance would be negatively associated with board independence, independent audit committees, auditor brand and leverage.

Findings during this research revealed no correlation between board independence, auditor type and corporate malfeasance. The test of the control variables showed no statistical difference between malfeasance and non-malfeasance firms (R-square of .065, adjusted R-square of .02). Although these results differ from other studies (Faber 2005, Frankel et al 2005, etc), this may be due to the years included in our studies. The recommendation of the Blue Ribbon Committee (1999) influenced the make-up of the board of directors and board committees. The results did not reflect any statistical difference except for auditor change during this study. Several of the auditor changes were from Arthur Andersen LLP to another audit firm in 2002. Consequently, this will be examined through a future study. The primary limitation of this study was that the initial 100 accounting malfeasance companies were not selected in a random manner from one population. However, there was also no bias in their selection. Although this limitation and other occurred, they did not hinder the contribution of this research to the

contemporary accounting literature.

Although malfeasance is a behavioral issue, enhanced business reporting and penalties for non-adherence to reporting requirements are attempts to reduce and change that behavior. Will it work? As the SEC now has more staff and, therefore, will be conducting more investigations and reviews of public companies' financial filing, future opportunities will enable studies of the SEC's results and assess what's working and what's not working. Other future studies could include a follow-up study of the status of the 100 selected malfeasance companies and their matches for a period of time to assess survivors, merger, bankruptcies, etc. would be an opportunity for future research. Future accounting issues on corporate malfeasance could include an assessment of whether malfeasance firms have more book value or market value than comparable non-malfeasance companies. Future work, pertaining to corporate governance, could include whether firms with malfeasance are more likely to have a higher percentage of interlock directors than non-malfeasance firms. It could also compare the number of other directorships held by directors of malfeasance firms as compared to a control group of firms with no announced malfeasance.

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APPENDIX A - MALFEASANCE TAXONOMY

1) Revenue

1-1: Fictitious Revenue – Revenue created through fictitious sales transactions or revenue created through cooperative/collusion with another company to increase both company's financial profile.

1-2: Revenue Timing – A valid sales transaction recognized as complete in a different accounting period than when the actual transaction was completed. This overstates revenue in one period and understates it in another.

1-3: Revenue Misclassification & Other Improprieties – Recognition or misclassification of sales transactions that are not valid sales transaction due to terms being incomplete and/or other contingent information.

2) Expense
2-1: Expense/Cost Classification – Misclassification, non-recognition or unauthorized expenses of the appropriate period.

2-2: Big Bang Theory – The process of recordings more costs and expense during an accounting period than normal when 1) a restatement resulting in lower income is required to be filed or 2) a significant loss has occurred for the reported period.

3) Income Inflation-Assets-Liabilities
3A: Inflated Income – Income inaccurate in announcement, but the specific revenue or expense impact or detail was not available. Only income impact is announced.

3B1: Assets overstated – Any situation where the specific revenue or expense detail was not available, but the resulting asset(s) or liability impact was announced.

3B2: Disclosures & Understated Liabilities – Any situation where the specific revenue or expense detail was not available, but the resulting liability impact was announced.

4) Theft – Misappropriation or misuse of company assets by company officers or employees.

5) Exogenous – Related party transactions, insider trading bribery or other conflict of interest or illegal activities resulting in non-company employee benefiting in an inappropriate manner.

BIOGRAPHY

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PORTRAIT OF A COMPANY: DEFINED BENEFIT PENSION PLAN SPONSORS

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ABSTRACT

This study describes firms that sponsor defined benefit pension plans (DBPP) based on firm specific characteristics, financial and operating performance. Firms are classified into portfolios based on their funding levels and described accordingly. The results suggest that firms in the most underfunded portfolio are on average smaller and value firms, with negative stock returns, poor financial and operating performance, lower profitability, invest smaller amounts in advertising, research and development and capital assets and are more indebted with higher probabilities of bankruptcy. The opposite is seen for the least and overfunded firms. The portrayal of these characteristics can help regulators in the effective identification of firms that may confront funding problems before it is too late. The detection of risk behavior or tendencies in terms of firm characteristics can help regulators in establishing policies to decelerate and improve pension plan funding levels and to protect the public interest.

JEL: G11, G23, M48

KEYWORDS – Defined benefit, pension plans, pension management, pension regulation

INTRODUCTION

How do firms that sponsor pension plans look? Do they all look alike? Firms that sponsor pension plans can be described based on their funding levels, size, financial and operating performance, to mention a few. Most importantly, they can be described based on the type of plan they sponsor. A pension plan is defined as an arrangement whereby an employer provides benefits (payments) to retired employees for services provided in their working years. Employers fund pension plans by making payments to a funding agency. The two most common types of pension plans are defined contribution (DC) plans and DBPP. In a DC plan, the employer agrees to contribute to a pension trust a certain sum each period, based on a formula. A company usually turns over to an independent third-party trustee the amounts originally contributed. The trustee, acting on behalf of the beneficiaries, assumes ownership of the pension assets and is accountable for their investment and distribution. The trust is separate and distinct from the employer. In terms of risk, the employee gets the benefit of gain (or the risk of loss) from the assets contributed to the plan.

In contrast, DBPP delineates the benefits that employees will receive when they retire. To meet the DB commitments that will start at retirement, a company must determine what the contribution should be today. Companies may use many different contribution approaches. However, the funding method should provide enough money at retirement to meet the benefits defined by the plan. The employees are the beneficiaries of a DC trust, but the employer is the beneficiary of a DB trust. Under a DB plan, the trust's primary purpose is to preserve and invest assets so that there will be enough to pay the employer's commitment to employees. The trust is a separate entity but the trust assets and the liabilities belong to the employer. That is, as long as the plan continues, the employer is responsible for the payment of the defined benefits (DB) (without regard to what happens in the trust). The employer must make up any deficit in the accumulated assets held by the trust. On the other hand, the employer can recapture any excess accumulated in the trust, either through reduced future funding or through a reversion of funds.
For years, firms that sponsor DBPP have been hard-pressed by regulators, government and employees to meet their pension funding obligations. As a result of these pressures, laws and regulations have arisen in

past years. For an employer the cost of sponsoring retirement benefits sometimes is steep. The need to properly administer and account for pension funds becomes apparent when the size of these funds is understood. For example, consider General Motors Corporation. The size of the pension fund for 2004 is $99,909 million, the pension expense is $2,456 per employee and its pension expense as a percentage of pre-tax income is 52.27 percent. Consider Hewlett-Packard, the size of the pension fund is $9,168 million, the pension expense is $594 million, and the pension expense as a percentage of pre-tax income is 14.16 percent. The size of Coca Cola's pension fund is $2,800 million, the pension expense is $122 million and its pension expense as a percentage of pre-tax income is 1.96 percent. These are a few examples to show the magnitude and impact of pension plans expense and obligation with respect to a firm's income. An overview of the impact of regulations on firms' pension plan accounting is also important to assess.

Efforts to improve information disclosure, pension contribution patterns and protection to employees include the enactment of ERISA (Employee Retirement Income System Act of 1974), the Pension Protection Act of 2006 and the Financial Accounting Standards Board (FASB) changes in accounting rules. Regulations like ERISA establish rules as to the way employers comply with the responsibilities related to pension plans they sponsor. For example that employers, in computing the funding status, should compare the market value of plan assets to the present value of future pension obligations, and, if a company has a pension plan that is less than 90 percent funded, it is required to make an additional contribution to the plan to reduce the funding deficiency within three to five years. This requirement impacts immediately earnings and cash flows of the sponsor.

Management has to be aware of the many implications of sponsoring pension plans. They should consider how to effectively deal with a DBPP in order to maintain a strong financial position and comply with regulations. Most importantly, they have to make sure that the pension plan trust managers protect the best interests of their employers and employees. Past studies describe companies that sponsor DBPP based on stock price relation to funding level, earnings and operating performance and level of capital expenditures. But few describe firms that sponsor DBPP in general. The purpose of this study is to describe these firms so regulators can help sponsors in identifying their problems, risks and courses of action in funding their plans.The paper proceeds as follows. The first section discusses the relevant prior literature, followed by hypotheses development and research methodology. Then, the sample selection procedure and data analysis are presented. Finally, the empirical findings and the conclusion are discussed.

RELATED LITERATURE

Past studies about companies that sponsor pension plans focus on different aspects related to the impact of these schemes. Some focus on price or returns, earnings and growth. Some like Franzoni and Marín (2006) focus on the impact of DBPP information on price. They find that the most underfunded firms earn low raw returns relative to firms with healthier pension plans. They interpret this result as being due to investors not paying enough attention to the implications of the current underfunding for future earnings and cash flows. Lakonishok, Shleifer, and Vishny (1994) argue that the value premium and the growth discount are explained by overreaction to past operating performance. Chan, Jegadeesh, and Lakonishok (1996) find that firms with negative past operating performance continue to earn low returns within a six month period. Jegadeesh and Titman (1993) propose that return momentum is at least partly due to underreaction to news in earnings. Sloan (1996), Chan, Chan, Jegadeesh and Lakonishok (2006) show evidence that the market does not understand that the part of earnings due to accruals tends to reverse itself. Other studies focus on the restrictions in expenses and investments that may arise from pension plan underfunding. Blackburn (2006) suggests that sometimes firms postpone the funding of employee's pension plans in order to finance capital expenditures and the growth of the enterprise. In other words, employees are financing the projects of their employers. He offers no empirical evidence

that suggests that this could be true. However, Rauh (2006) examines the effects of mandatory contributions to DBPP on capital and research and development expenditures. The author finds that pension sponsors decrease spending on capital expenditures in response to a reduction in internal resources caused by required pension contributions. The author also shows results for firms that do not sponsor DBPP. The evidence suggests that when required contributions are high DB sponsoring firms do not undertake capital investments, and non-sponsoring firms undertake in approximately 12 percent of total capital investment that those firms leave.

When it comes to credit aspects, some studies show that firms with financing problems may choose to delay payments to fund their plans. Ippolito (1986) finds evidence that suggests that firms in financial distress have incentives to underfund their pension plans. Phillips and Moody (2003) examine the relationship between pension plan funding levels and capital structure and provide statistically significant empirical support for the pecking order theory of capital structure. Results suggest that more highly levered firms experience lower profitability and are constrained by a larger dividend payout. In addition, these firms have exhausted their internal resources of financing by underfunding their pension plans, most likely to the extent legally possible. The study shows that underfunding occurs mainly due to a firms' incapacity to fully fund.Other studies consider the impact of taxes on the decision to fund adequately the plan. Thomas (1988) study rejects the view that pension funding status and tax status are unrelated. The results of empirical tests, time-series and cross-sectional, suggest that tax status is an important determinant of pension funding. Firms with relatively higher tax status are frequently overfunded, relative to the accrued liability; 4) low tax status firms are less likely to select DBPP. Tepper and Affleck (1974), Black (1980) and Tepper (1981) find that firms with tax advantages have great or strong incentives to fully fund their pension plans.

Recently, regulators have been focusing on changing the way DBPP information is disclosed. In a recent study, Shaw (2008) argues that SFAS 158 significantly changes the balance sheet reporting for DBPP. Coronado, Mitchell, Sharpe and Nesbitt (2008) state, that since the appearance of SFAS 158 and the increased attention to pension disclosures misuse, investors evaluation of pensions may have changed and so, their investment decisions. Boylan and Houmes (2010) evaluate the impact of SFAS 158 and find that companies use higher discount rates to lower the pension benefit obligations and pension liabilities with the intention of portraying a better financial position. Chen et al. (2010) find that there is a direct relation between the use of pension disclosures and the level of sophistication of users. Castro-González (2011) shows that investors inefficiently value firms that sponsor DBPP even when changes in accounting rules required additional disclosures.Is more regulation about accounting disclosures going to solve the problem about pension plans underfunding? Or is it necessary to identify the symptoms and find solutions before it is too late? The results of these studies show the characteristics of firms that sponsor DBPP and how the funding status is related to financial and operating characteristics. Moreover, how companies manipulate DBPP information to influence the accounting information that is available to the public. The motivation of this study is to describe firms that sponsor DBPP and to create awareness of the impact of different funding levels.

DATA AND METHODOLOGY

In order to describe firms that sponsor DBPP data from different sources was obtained. The sample includes all firm years with available data on the Compustat Annual Industrial and Research files for NYSE, AMEX, and NASDAQ firms. The sample period is the end of fiscal year 1980 to the end of fiscal year 2006. Firms' monthly returns were obtained from the Center for Research and Security Prices (CRSP), Monthly Stock database.

The variables of interest correspond to different accounting items over the years. Consequently, this accounting data is constructed differently for different periods in the time span that is studied. There are

two breaks in the way Compustat informs the data related to pension plans. These breaks result from changes in accounting standards. The first break is caused by the accounting standard SFAS 87. It affects the way pension data is presented starting fiscal years beginning after December 15, 1986. The second break, effective for fiscal years beginning after December 15, 1997, is caused by SFAS 132. In order to measure the funding status of the pension plans, the procedure used by Franzoni and Marín (2006) is used. Funding status is defined as the difference between the fair value of pension assets (*FVPA*) and the pension benefit obligation (*PBO*). They choose to divide the funding status by market capitalization (*Mkt Cap*) at the end of the fiscal year when the pension items are measured to control for size. As them, this variable is labeled funding ratio (*FR*). This variable is computed as follows:

$$FR_{t-1} = FVPA_{t-1} - PBO_{t-1} / Mkt\ Cap_{t-1} \quad (1)$$

Initially, there were 52,018 observations (firm-years). To correct for the effect of outliers, observations for each year in which the *FR* variable is more than five standard deviations away from the annual mean, were dropped from the sample. As a result, there are 51,515 observations (firm-years) that satisfy these criteria. Firms are included if they have at least two years of accounting data in order to correct for the survival bias (Banz and Breen 1986 and Franzoni and Marín 2006). Firms that do not have at least two years of accounting data were excluded. Finally, 51,441 observations were used in this study.

Portfolio Formation Procedure

The characteristics of firms with different levels of pension plan funding are important to design a sketch of firms that sponsor DBPP. Accordingly, firms are divided into deciles or portfolios. In order to include a company in a portfolio, it has to satisfy selection criteria. To be included in the *FR* portfolios in year *t* - 1, a firm needs to have non-missing value for *FR*. In the fourth month, after the end of fiscal year $t - 1$, the selected companies are allocated to ten groups according to their *FR* at the end of fiscal year $t - 1$. First, ten portfolios are formed using deciles of the distribution of *FR* for underfunded firms ($FR<0$), while the eleventh portfolio includes all the overfunded firms ($FR\geq0$). For the underfunded portfolios, the first portfolio contains the most underfunded firms and the tenth portfolio contains the least underfunded firms. As for the overfunded portfolio, it contains all overfunded firms.

Companies' Characteristics

Companies can be described in different ways. As for this study, firms are described based on size of the plan, operating and financial performance, spending behavior, ability to meet obligations and probability of bankruptcy, number of employees and tax advantages. Penman (2010) describes financial statements as the 'lens on a business' and its analysis as the 'calibrator' of the lens to get the business into focus. First, firms are described based on the funding level as described by *FR*. Then firms are described based on size and book to market ratio (B/M). These two characteristics may have a role on the way market value firms. Smaller firms tend to be less exposed and scrutinized by analysts. Quality and quantity of information available may have an impact in the way the market evaluates them. Financial and operating performance is also measured for these firms. First, average stock returns (AR) are measured to observe if the stocks of the firms in each portfolio have positive or negative returns. Then, cash flows to total assets (CF/TA), net income to total assets (NI/TA), sales to total assets (Sales/TA) and sales to net income (Sales/NI) ratios are calculated at the end of fiscal year $t - 1$.

Franzoni and Marín (2006) find that it appears that the two most underfunded portfolios tend to have poorest operating performance before and after formation. Interestingly, they found that, both earnings and cash flows ratios are lower in the first year after formation for the most underfunded firms, while this was not necessarily the case for the other firms. These findings are important because it may be a signal that poor past performance is the reason why these firms did not timely fund their pension liability and

developed a large underfunding. They also argue that the fact that the operating performance worsens in the first year after formation is consistent with pension liability negatively impacting earnings and cash flows, and that it corroborates their explanation of the observed low returns for underfunded firms.

Spending behavior indicators are also presented. The advertising expenses to sales (AE/Sales), capital expenditures to total assets (CE/TA) and research and development (R&D/TA) ratios are calculated in order to verify if there are differences among portfolios. Rauh (2006) suggests that an inverse relation exists between capital expenditures and contributions to the plan.In order to verify the level of debt, the ability to meet obligations and the probability of bankruptcy, the long-term debt ratio (LTDR), interest coverage ratio and the Altman Z-score are calculated. The balance in long-term debt for each firm is normalized using total assets. The interest coverage ratio (IntCov) is calculated to observe if firms included in different portfolios can cover their interest expenses with their current earnings.

The Altman Z-score is included as a measure of company distress. Altman's Z-score (Altman Z) is used as an ex-ante measure of the likelihood of default. Altman's Z-score is calculated as Z = 1.2 (Working Capital/Total Assets) + 1.4 (Retained Earnings/Total Assets) + 3.3 (Earnings before Interest and Taxes/Total Assets) + 0.6 (Market Value of Equity/Book Value of Liabilities) + 0.999 (Net Sales/Total Assets). Altman (1977) documents that firms having a Z-score less than 1.81 are highly likely to become bankrupt.

The average number of employees is also calculated for each portfolio decile. This is obtained as a means to evaluate the size of the pension plan for the firms in the deciles. Firms with more employees may have higher pension costs because of the number of employees covered by the plan.Lastly, the average annual tax rate (AATR) is calculated. It is calculated in order to verify the magnitude of the tax advantages that firms can obtain from recognizing interest expenses and pension and retirement expenses. Thomas (1988) study rejects the view that pension funding status and tax status are unrelated.

Descriptive Statistics

Table 1 provides summary statistics on the main pension items and the *FR*. Panel A displays summary statistics for the whole sample period. The average *FVPA* is about $645 million in the whole sample and the average *PBO* is about $664 million. The average *PBO* corresponds to about 103% of the *FVPA* in the sample period. The average funding level, as measured by *FR* is -17%, in contrast to the median which is almost 0%. These figure results from combining highly overfunded and highly underfunded firms. The minimum *FR* is -5940%, while the maximum is 154%. The average *PRE* is about $22.3 million, while the median is about $2.18 million. The minimum *PRE* is -$3.489 billion and the maximum is $3.435 billion.

Panel B, C and D present summary statistics for the different accounting related periods described earlier. These periods differ in various ways. The most important differences are observed in the relationship between the average PBO and the average *FVPA*. For the period between 1980 and 1986, the average *PBO* represents about 76% of the *FVPA*. This is reflected in average the *FR* for firms in this period. On average, they portray a positive *FR*. Circumstances change, and start to deteriorate, for the next period. This period corresponds to the years between 1987 and 1997. Required accounting disclosures are broader for this period. In contrast, the *PBO-FVPA* relationship weakens. The average *PBO* represents about 95% of the average *FVPA* and the average *FR* is negative. As for the last period, years between 1998 and 2005, a worse scenario is observed as the gap between the average *PBO* and the average *FVPA* widens. The average *PBO* represents about 106% of the average *FVPA*. As a consequence, the average *FR* worsens and continues to be negative. As observed from this description, the DBPP position looks gloomier as years pass.

Table 1: Pension Plan Funding over Time

Panel A: 1980-2006				
	FVPA	**PBO**	**FR**	**PRE**
Mean	645.69	664.03	-0.172	22.292
Median	38.71	38.55	0	2.181
SD	3332	3412	29.100	129.74
Min.	0	0	-5940	-3,489
Max.	112,898	109,774	154.05	5,290
Panel B: 1980-1986				
	FVPA	**PBO**	**FR**	**PRE**
Mean	155.97	117.748	0.044	13.046
Median	9.012	6.372	0.02	1.135
SD	993.046	700.465	1.464	78.352
Min.	0	0	-32.827	-258
Max.	46380.313	26161.305	133.543	3,516.400
Panel C: 1987-1997				
	FVPA	**PBO**	**FR**	**PRE**
Mean	505.855	482.722	-0.018	13.379
Median	43.914	42.555	0.0002	1.682
SD	2521	2454	2.414	81.843
Min.	0	0	-245.273	-709
Max.	78,360	83,390	90.4	4,300
Panel D: 1998-2006				
	FVPA	**PBO**	**FR**	**PRE**
Mean	1164.616	1274.331	-0.516	39.851
Median	85.761	102.314	-0.008	4.814
SD	4866	5086.500	49.867	190.955
Min.	0	0	-5940.34	-3,490
Max.	112,898	109,770	154.055	5,290

The table reports the mean, median, standard deviation, minimum and maximum for the pension and retirement expenses (PRE), and pension and retirement expenses ratio (PRER), the fair value of plan assets (FVPA), the projected benefit obligation (PBO), and the funding ratio (FR). The results are presented for the complete sample period, for the period between 1980 and 1986 (before SFAS No. 87), for the period between 1987 and 1997 (the period after SFAS No. 87) and for the period between 1998 and 2006 (after SFAS No. 132). These amounts are expressed in millions and percentages for the ratios.

EMPIRICAL RESULTS

Portfolio Characteristics

Table 2 reports the characteristics of the eleven portfolios created according to *FR*. The characteristics in Panel A are measured at the end of fiscal year $t - 1$ relative to portfolio formation. The difference in the level of average *FR* between the most underfunded portfolio and the least underfunded is noticeable. For the most underfunded firms (portfolio one) the average *FR* is about -515%. In contrast, for the least underfunded firms (portfolio 10) the average *FR* is about -0.1%. The average *FR* for the portfolio that contains overfunded firms (portfolio eleven) is about 8.8%.

Table 2: FR Portfolios Characteristics

	Most under									Least under	Over
Measure	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
FR	-5.150	-0.119	-0.062	-0.039	-0.025	-0.017	-0.011	-0.007	-0.004	-0.001	0.088
Size	2,506	3,319	3,417	3,418	5,195	4,376	4,791	5,396	5,226	7,865	3,137
B/M	21.091	0.830	0.786	0.806	0.721	0.679	0.620	0.605	0.562	0.500	2.003
AR	-0.003	0.008	0.010	0.010	0.013	0.013	0.015	0.016	0.017	0.020	0.013
AR St Dev	0.197	0.140	0.122	0.119	0.118	0.111	0.108	0.117	0.114	0.123	0.111
CF/TA	-0.004	0.005	0.006	0.005	0.014	0.010	0.006	0.009	0.010	0.026	0.003
NI/TA	-0.073	0.005	0.029	0.031	0.025	0.057	0.071	0.069	0.082	0.062	0.044
Sales/TA	1.490	1.439	1.398	1.416	1.396	1.259	1.296	1.337	1.241	1.140	1.332
Sales/NI	0.063	0.110	0.128	0.133	0.137	0.152	0.172	0.176	0.181	0.163	0.146
AE/Sales	0.032	0.021	0.023	0.025	0.029	0.037	0.038	0.034	0.034	0.037	0.037
CE/TA	0.048	0.045	0.046	0.049	0.048	0.048	0.053	0.052	0.056	0.063	0.071
R&D/Sales	0.018	0.019	0.022	0.024	0.028	0.040	0.033	0.035	0.058	0.066	0.030
LTDR	63.69	1.128	0.889	0.698	0.595	0.503	0.434	0.437	0.430	0.394	1.908
Altman Z	1.520	2.436	3.146	3.419	3.612	4.070	4.387	4.770	5.520	5.663	3.656
IntCov	5.60	6.08	10.24	17.30	42.06	40.31	58.26	109.31	361.56	60.79	24.31
Employees	16,808	37,000	17,039	24,166	23,523	27,374	27,810	23,269	18,272	37,893	17,262
AATR	0.348	0.221	0.217	0.294	0.359	0.300	0.342	0.207	0.396	0.479	0.369
Firms	1,668	2,007	2,057	2,072	2,106	2,141	2,133	2,159	2,151	2,149	22,197

In the fourth month after the end of fiscal year t, firms with available data at the end of fiscal year t-1 are divided in deciles according to FR. The stocks in the first portfolio are the most underfunded and the stocks in the tenth portfolio are the least underfunded. Firms with positive FR are assigned to portfolio eleven. The sample period is from the fourth month after the end of fiscal year 1980 to 2006.

As for the average size of firms in each portfolio, size almost consistently increases as the underfunding decreases. Smaller firms are concentrated in the most underfunded portfolio. Interestingly, firms in portfolio eleven have the second smallest average size of all the portfolios. In terms of B/M, value firms are concentrated in the most underfunded portfolio. Portfolio eleven also has value firms but to a much lesser degree. Means and standard deviations for the excess returns of the portfolios are also reported. AR increase as you move from portfolio one through ten. Portfolio eleven has AR equal to firms in portfolio five and six. Portfolio one has negative returns with the highest standard deviation and portfolio ten has the highest AR and a low standard deviation.

This table also reports the ratios that measure operating and financial performance. First, it shows the results for the average change in cash flows to total assets ratio. As Franzoni and Marín (2006) the most underfunded portfolio shows the lowest levels for this ratio. In concurrence to these findings, the results in this study reveal that, on average, at the end of fiscal year before portfolio formation, the most underfunded portfolio shows the most negative change in cash flows. In addition, this portfolio shows that on average these firms reported net losses to total assets. Also, the sales to net income ratio reveals the poor operating performance of these firms. In contrast, for the least underfunded portfolios (portfolios nine and ten) that the cash flow to total assets, net income to total assets and the profitability ratios are higher.The spending behavior measures are also presented in Table 2. The reported results show that, on average, the most underfunded portfolios report lower advertising, research and development and capital expenditures at the end of fiscal year before portfolio formation. These results could be related to a stringent financial situation. As Rauh (2006) explains, it can also be attributed to the firms' response to a reduction in internal resources caused by required pension contributions.

Measures of company distress and paying ability are also presented. The most underfunded firms have the highest levels of *LTDR*. A consistent decrease in *LTDR* is observed through portfolio ten. The firms with highest levels of pension plan related debt have also the highest levels of long-term debt. As a measure of financial distress, Altman's Z-score is presented for all portfolios. The results show that the most underfunded portfolio contains firms that on average have a higher risk of bankruptcy. In concurrence with these results, the IntCov ratio results show that the most underfunded portfolios (portfolios one and two) are less able to cover their interest expenses at their current earnings levels.

As a means to describe these firms as labor or capital intensive, the average number of employees per portfolio is shown. The most underfunded portfolios have on average fewer employees than the least underfunded portfolios; the least underfunded portfolios have, on average more employees. Finally, the AATR is calculated for each portfolio. The magnitude in tax advantages and the financial position of the firm may have influence in the way firms choose to fund their pension plans. At no surprise the firms with the least underfunded and overfunded firms have higher average tax rates than the others. In these cases management may be benefiting from pension related tax advantages.

CONCLUSIONS

Financial statements reveal the financial history of companies. Financial information may become more useful when relationships among numbers, accounts or pieces of information are made and compared to past years ratios, to competitors or to industry averages. But sometimes financial amounts reflect the symptoms of a current of future negative situation. The goal of this study was to describe firms that sponsor defined benefit pension plans (DBPP) based on firm specific characteristics, financial and operating performance. To accomplish this goal firms were classified into portfolios based on their funding levels and described accordingly. As for firms that sponsor DBPP and the relationships observed in this study, portraits can be drawn. For example, firms in the most underfunded portfolio are on average smaller and value firms, with negative stock returns, poor financial and operating performance, lower profitability, invest smaller amounts in advertising, research and development and capital assets and are more indebted with higher probabilities of bankruptcy. The opposite is seen for the least and overfunded firms. These differences may have an explanation.

Usually, smaller firms may have less access to different sources of financing (for example bond markets). Analysts do not follow smaller firms as closer as they do with bigger firms. This may happen because of less availability of information and less news coverage. Because of their lessen ability to raise funds, smaller firms may be more inclined to underfund their pension plans. Higher underfunding levels may be accompanied by high levels of long-term debt in order to finance the operations and the pension plans.

The observed characteristics are consistent with the results in previous studies. Franzoni and Marín (2006) find evidence of overvaluation for firms with severely underfunded pension plans; Rauh (2006) finds that pension sponsors decrease spending on capital expenditures in response to a reduction in internal resources caused by required pension contributions; Phillips and Moody (2003) argue that POT explains that firms will borrow, rather than issuing equity, when internal cash flow is not sufficient to fund capital expenditures. It may be possible that firms in portfolio one choose to underfund their plans in order to compensate (use the funds in other activities) for their poor financial performance. As for tax related issues, Thomas (1988) study rejects the view that pension funding status and tax status are unrelated. The results reveal that firms with higher levels of average tax rates have lower levels of underfunding. This phenomenon may occur because firms identify tax advantages for contributions made to fund their pension plans. Although this study uses a sample of US public companies with available DBPP information from 1980 to 2005 and does not include pension data under the new accounting rules (SFAS No. 158) the results appear to be dramatic. Future studies may focus on periods after the issuance of this new accounting rule. By comparing the results in both studies, regulators may be able to verify if

changes in this accounting rule prove to attain its objective. By examining pension funding levels regulators may identify more effectively firms that confront or may confront funding problems before it is too late. The detection of risk behavior or tendencies can help regulators in establishing policies to decelerate and improve pension plan funding levels to protect the public interest.

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BIOGRAPHY

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THE ETHICS OF TAX EVASION: A SURVEY OF HISPANIC OPINION

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ABSTRACT

The present paper is an empirical study, the goal of which is to determine the strength of various arguments that have been used to justify tax evasion and to determine whether results differ based on certain demographic variables. A survey instrument was constructed using a seven-point Likert and distributed to 316 business students at a university in South Texas. The 18 arguments were ranked in terms of strength, from strongest to weakest. Comparisons were also made according to gender, age, and academic major to determine if the viewpoints for these demographics were significantly different. Academic major was the only demographic variable where significant differences in opinion were found. For some of the 18 arguments justifying tax evasion, accounting students were significantly more averse to tax evasion than were business and economics majors. Some arguments justifying tax evasion were stronger than others. The strongest arguments for evading taxes were in cases where the government engaged in human rights abuses. Other strong arguments were in cases where the tax system was perceived as unfair, where tax rates were too high, where government officials were corrupt or where tax funds were not spent wisely.

JEL: H26; J1; J14; J15; J16; K34; M4

KEYWORDS: tax evasion, Hispanic, gender, age, major, demographic

INTRODUCTION

The research issue we focus on is tax evasion. Tax revenues are important because the governmental services necessary for modern civilization must be funded by tax revenues. More government services could be provided if there was no tax evasion. Joel Slemrod (2007) has noted that determining the extent of tax evasion is not straightforward. He observes that the most careful and comprehensive estimates of the extent of tax compliance have been made by the U.S. Internal Revenue Service (IRS). The dollar estimate of annual tax evasion is labeled as the "tax gap" by the IRS. A 2009 Department of Treasury document (no author designated) reports that for Tax Year 2001 the "tax gap" was $345 billion dollars. Further the IRS observes this represents a noncompliance rate of 16.3%. Detail in the document reveals that over $255 billion dollars of the total tax gap is due to the individual income tax, which suggests that studying individual attitudes toward tax evasion is most appropriate.

Tax evasion is studied by researchers from multiple disciplines and with different perspectives. As will be discussed further in the literature review, which is the next section of the paper, the scholarship on tax evasion is exceedingly diverse and includes both theoretical and practical orientations with little observable convergence of the many research streams at this point in time. This research effort is one of a tiny number which approach tax evasion from an ethical viewpoint. This is a necessary perspective because the psychologists, economists, and legal experts who build models and attempt to make assist in the development of tax policy will be limited in the contribution they can make if they and tax policy makers are not familiar with the ethical reasoning of individuals who make the choice to evade or not evade the individual income tax. Our research is also valuable because it seeks to examine an understudied but unique and increasingly important segment of Americans, Hispanics

The remainder of the paper is organized as follows. The next section reviews the relevant literature. Examples of tax evasion research from different research streams are identified. The bulk of the literature review provides a more lengthy discussion of the ethics based research which is the research stream, which includes our paper. Data selection and methodology are described in the third section. The institution where the data was collected is named and some descriptive statistics are provided. Also the hypotheses are enumerated with the motivation for their inclusion. The fourth section reviews the results of the study and this section provides analysis and interpretations of the empirical findings. The fifth and final section concludes the research discussion and it highlights the contribution of the paper and suggests possibilities for further research. The survey instrument is included as an attachment.

LITERATURE REVIEW

Tax evasion scholarly research has been generated by accountants, economists, lawyers, and psychologists. Eric Posner (2000) is a law professor who writes from a legal perspective and an economic perspective. He notes that the bulk of taxpayer comply with the tax law has and thus seemingly contradict the standard economic model of law enforcement, which holds that people violate the law if the benefit exceeds the expected sanction. Although Posner does not then proceed to approach the issue from an ethical perspective, we argue that his observation motivates our approach which is to research ethical reasoning. Posner (2000) comments that the literature on tax evasion has not converged methodology wise and that all the ideas offered in the literature do not cohere. Slemrod (2007) is an economist who has reviewed the economics of tax evasion considering the public policy economics literature, and the models and tests and models of the economics-based positive theory of tax evasion. Slemrod has very significantly contributed to the public policy research stream through his work as Director of the Office of Tax Policy Research, at the University of Michigan Business School. Allingham and Sandmo (1972) developed the behavioral economic model which dominates the model building economic literature, although one is reminded that Posner observes that this literature seemingly under predicts the extant level of tax compliance, suggesting that an improved understanding of the ethical choices of individuals might enhance the current state of the art in tax compliance/tax evasion model building .

Psychologists such as Kirchler, Hoelzl, and Wahl (2008) also contribute to the literature of behavioral model building with research that adds the notion of social norms to the more traditional base of self-centered economic type model building assumptions. One could imagine such social norms model building eventually linking directly to the ethical reasoning literature which we pursue. The remainder of this literature review is a discussion of the ethical reasoning tax evasion literature, Although many previous studies have investigated tax compliance, very few have examined tax compliance, or rather noncompliance, primarily from the perspective of ethics.

The ethics of tax evasion can be examined from a number of perspectives. Some of these are of a religious nature while others are more secular and philosophical. One approach is to examine the relationship of the individual to the state. Another is to review the relationship between the individual and the taxpaying community or some subset thereof. A third perspective is to observe the relationship of the individual to God. Martin Crowe (1944) examined the literature using all of these approaches in his doctoral thesis, *The Moral Obligation of Paying Just Taxes*. He reviewed the theological and philosophical debate that had been going on, mostly within the Catholic Church, over the previous 500 years.

One of the most comprehensive analyses on tax evasion from a philosophical perspective was a doctoral thesis written by Martin Crowe in 1944. The *Journal of Accounting, Ethics & Public Policy* published a series of articles on tax evasion from various religious, secular and philosophical perspectives in 1998 and 1999. Most of those articles were also published in an edited book (McGee, 1998a). Since the publication of that book a few other articles have addressed the issue of tax evasion from an ethical perspective.

The ethics of tax evasion can be examined from a number of perspectives. Some of these are of a religious nature while others are more secular and philosophical. One approach is to examine the relationship of the individual to the state. Another is the relationship between the individual and the taxpaying community or some subset thereof. A third is the relationship of the individual to God. Martin Crowe (1944) examined the literature on these approaches, which are the three main approaches that have been taken in the literature over the past five centuries.

One empirical study on the ethics of tax evasion was conducted by Nylén (1998), who distributed a survey soliciting the views of Swedish chief executive officers (CEOs). McGee (1998e) commented on this study. A study by Reckers, Sanders and Roark (1994) presented participants with a case study and asked them whether they would be willing to evade taxes. Englebrecht et al (1998) did a study involving 199 subjects who replied to 29 ethical orientation questions, some of which had to do with tax evasion. Inglehart et al (2004) conducted a large survey of more than 200,000 people in more than 80 countries that asked more than one hundred questions, one of which was about tax evasion. McGee and Tyler (2007) used the Inglehart data to examine the views on tax evasion of 33 countries.

Although many studies investigated issues about tax compliance, very few have examined tax or levies compliance, or rather noncompliance, primarily from the perspective of ethics. A significant number of studies on tax evasion look at the issue from the perspective of public finance or economics, with ethical issues mentioned briefly, if at all. The most comprehensive twentieth century work on the ethics of tax evasion was a doctoral thesis written by Martin Crowe (1944), titled *The Moral Obligation of Paying Just Taxes*. This thesis reviewed the theological and philosophical debate that had been going on, mostly within the Catholic Church, over the previous 500 years. Some of the debate took place in the Latin language. Crowe introduced this debate to an English language readership. A more recent doctoral dissertation on the topic was written by Torgler (2003), who discussed tax evasion from the perspective of public finance but also touched on some psychological and philosophical aspects of the issue. Alfonso Morales (1998) examined the views of Mexican immigrant street vendors and found that their loyalty to their families exceeded their loyalty to the government.

There have been a few studies that focus on tax evasion in a particular country. Ethics are sometimes discussed but, more often than not, the focus of the discussion is on government corruption and the reasons why the citizenry does not feel any moral duty to pay taxes to such a government. Ballas and Tsoukas (1998) discuss the situation in Greece. Smatrakalev (1998) discusses the Bulgarian case. Vaguine (1998) discusses Russia, as do Preobragenskaya and McGee (2004) to a lesser extent. A study of tax evasion in Armenia (McGee, 1999b) found the two main reasons for evasion to be the lack of a mechanism in place to collect taxes and the widespread opinion that the government does not deserve a portion of a worker's income.

A number of articles have been written from various religious perspectives. Cohn (1998) and Tamari (1998) discuss the Jewish literature on tax evasion and on ethics in general. Much of this literature is in Hebrew or a language other than English. McGee (1998d, 1999a) commented on these two articles from a secular perspective.

Several articles have been written on the ethics of tax evasion from various Christian viewpoints. Gronbacher (1998) addresses the issue from the perspectives of Catholic social thought and classical liberalism. Schansberg (1998) looks at the Biblical literature for guidance. Pennock (1998) discusses just war theory in connection with the moral obligation to pay just taxes, and not to pay unjust or immoral taxes. Smith and Kimball (1998) provide a Mormon perspective. McGee (1998c, 1999a) commented on the various Christian views from a secular perspective.

The Christian Bible discusses tax evasion and the duty of the citizenry to support the government in several places. Schansberg (1998) and McGee (1994, 1998a) discuss the biblical literature on this point. When Jesus is asked whether people should pay taxes to Caesar, Jesus replied that we should give to Caesar the things that are Caesar's and give to God the things that are God's (Matthew 22:17, 21). But Jesus did not elaborate on the point. He did not say what we are obligated to give to the government or whether that obligation has limits. There are passages in the Bible that may be interpreted to take an absolutist position. For example, Romans 13, 1-2 is read by some to support the Divine Right of Kings.

A few other religious views are also addressed in the literature. Murtuza and Ghazanfar (1998) discuss the ethics of tax evasion from the Muslim perspective. McGee (1998b, 1999a) comments on their article and also discusses the ethics of tax evasion under Islam citing Islamic business ethics literature (McGee, 1997). DeMoville (1998) discusses the Baha'i perspective and cites the relevant literature to buttress his arguments. McGee (1999a) commented on the DeMoville article. McGee (2004) discusses these articles in a book from a philosophical perspective.

Some empirical studies have been conducted that solicit views on the ethics of tax evasion. McGee and Cohn (2008) surveyed the views of Orthodox Jews. The views of international business academics (McGee, 2005a) and various groups in Romania (McGee, 2005b), Thailand (McGee, 2006), Poland (McGee & Bernal, 2006), Hong Kong (McGee, Ho & Li, 2008) and China (McGee & Noronha, 2008) have used survey instruments similar to the one used in this study. The present study replicates these studies but samples a predominantly Hispanic population, which has not been done before. Garcia (1997) has discussed personal ethics and moral reasoning from the viewpoint of American Hispanics. He states that the moral understanding and ways of American Hispanics are closely tied to their membership in well-defined ethnic groups. Hispanic morality, Garcia continues, "is influenced as much by the positive and negative elements of our Hispanic culture as by the positive and negative experiences we must respond to within Anglo Saxon culture." Given the uniqueness and importance of Hispanics in America we believe our research makes an important contribution to developing a complete understanding of the ethics of tax evasion in contemporary America.

DATA AND METHODOLOGY

The survey was distributed to graduate and undergraduate accounting and business students at Texas A&M International University in Laredo, Texas. Three hundred nineteen (319) usable responses were collected. Data were compiled and examined based on gender, student status, major, ethnicity, residence and religion. The vast majority of students were Hispanic.

In testing the assumptions of the research, the authors obtained the overall descriptive characteristics of the variables for the original data. However, different procedures have applied to categorical variables (status, major, gender, age, residence, ethnicity and religion) versus continuous variables (Survey questions 1-18). Table 5 contains the expanded statistical output. The sample characteristics suggest (Table 1) that the dominant majority of respondents were undergraduate students (84%) of Hispanic ethnic background (88%), residing in the USA (88%), aged under 25 (69%) and were Catholics by their religious affiliation (78%). Gender differentiation was somewhat evenly split with males standing at 47% and females at 53%, while the area of concentration has been divided in the following order: business including economics 46%, accounting 38%, law 5% and all others. Detailed frequency tables (Tables 6-8) for original data are shown below.

After carefully evaluating descriptive characteristics of the original data, the authors decided to focus on the categorical variable representing only the Hispanic segment of the population (88.2% of the original data). Furthermore, it became evident that categorical variables of "Status", "Religion" and "Residence" appeared to be skewed in one or the other direction. For example, the sample consisted of 77.5 percent of

Catholics, with the remaining 22.5 percent spread among four other categories. Therefore, the authors decided to limit the use of their statistical value for further consideration. The main ethnic group was Hispanic (88.2%), with the remaining 11.8 percent distributed over four other categories. Thus, a comparison based on religion or ethnicity would not be worthwhile because of the small sample sizes for non-Catholics and non-Hispanics.

Table 1: Total Sample Demographic Data

STATUS	**%**	**GENDER**	**%**
GRADUATE STUDENT	13.2	MALE	46.6
UNDERGRADUATE STUDENT	84.3	FEMALE	53.4
OTHERS	2.5		100
	100		
MAJOR	**%**	**AGE**	**%**
ACCOUNTING	38.3	UNDER 25	68.6
BUSINESS-ECONOMICS	45.7	25-40	25.8
THEOLOGY-RELIGIOUS STUDIES	0.6	OVER 40	3.8
LAW	4.5	N/A	1.7
OTHER	10.9		100
	100		
RESIDENCE	**%**	**ETHNICITY**	**%**
MEXICO	11.8	NON-HISPANIC WHITE	6.5
USA	88.2	HISPANIC	88.2
	100	AFRICAN-AMERICAN	2.6
RELIGION	%	ASIAN	2.3
CATHOLIC	77.5	OTHERS	0.3
OTHER CHRISTIAN	17		100
JEWISH	0.3		
NONE-ATHEIST-AGNOSTIC	0.3		
OTHER	4.8		
	100		

The table lists the details for the various demographic factors, which include student status, academic major, residence, religion, gender, age and ethnicity. Figures listed are for the entire sample.

Table 2: Hispanic Sample Demographic Data

GENDER	
Male	43.0%
Female	57.0%
	100.0%
MAJOR	
Accounting	38.7%
Business-Economics	43.2%
Other	18.1%
	100.0%
AGE	
Under 25	63.8%
25-40	36.2%
	100.0%

The table lists the details for the demographic factors for the Hispanic portion of the total sample that were analyzed, which include gender, academic major and age. Other demographic factors were not examined because the sample was too homogeneous to allow comparisons between groups.

The "Age" categorical variable has been compressed to only two levels "Under 25" and "Above 25". Table 2 represents descriptive statistics for the restricted population selected for this academic investigation.

Not much research has been done to analyze views on tax evasion from a Hispanic perspective. Thus, the present research helps to fill this gap in the literature.

Hypotheses

H-1: Hispanic students of both sexes have similar attitude toward different ethical aspects of tax evasion.

This hypothesis is of interest because gender seems to be an important variable documented in some social science research. Ruegger and King (1992) note that their findings, "suggests that gender is a significant factor in the determination of ethical conduct and that females are more ethical than males in their perception of business ethical situations". This study surveyed students at the University of Southern Mississippi. On the other hand more recent research by Bageac, Furrer, and Reynaud (2010) using French and Romanian management students commented that. "Our results show that the relationship between gender and the perception of business ethics is ambiguous." The research cited in this paragraph did not look at American Hispanic students, and it is of interest whether or not American Hispanics are more similar to American students at the University of Southern Mississippi or to the European students evaluated by Bageac, Furrer, and Reynaud (2010).

H-2: Area of concentration (Major) does not influence the attitude of Hispanic students toward different ethical aspects of tax evasion.

This hypothesis looks at ethical differences according to major. McGee and Bose (2008) found that major was significant in a study of Australian students. This hypothesis is of interest because some other prior research has not found ethical differences according to major. While an area of concentration difference, if it exists, might be due to self-selection, training effects, a combi9nation of these causes, or any number of other causes as yet unidentified. Documentation would be important, especially if it can later be shown that it is due to training effects. This would suggest that at least under some circumstances training could generate improved moral outcomes.

H-3: Age differentiation does not influence the attitude of Hispanic students toward different ethical aspects of tax evasion.

Previous ethical research on ethics has sometimes found age to be predictor of ethical decision making, and sometime not. Glover, Bumpus, Logan and Ciesta (1997) found that, "Age was not a predictor of ethical decision making. On the other hand, Babakus, Cornwall, Mitchell, and Schlegelmilch (2004) found that, "younger respondents tend to view unethical behaviour as more acceptable." The first study cited looked at Americans, the second study looked at six nationalities, including Americans. Given the divergent results, research focused on the ethics of Hispanic Americans is of interest because it is a new group to study and because earlier results seem to differ.

H-4: Hispanic students of both sexes and of all areas of concentration have similar attitude toward different ethical aspects of tax evasion.

This hypothesis is important because the documentation of this interaction would be interesting, especially because prior research has sometimes found significance concerning area of concentration and also often detected significant gender difference. A significant interaction when Hispanics are studied would be an important contribution.

H-5: Hispanic students of both sexes and of all ages have similar attitude toward different ethical aspects of tax evasion.

This hypothesis is of interest because, based on prior research, this interaction gender is often, but not always significant, and age is often significant with women often detected as more ethical.

H-6: Hispanic students of all areas of concentration and of all ages have similar attitude toward different ethical aspects of tax evasion.

This hypothesis is important to consider because although both age and are of concentration are sometimes important when other ethnic groups have been studied. Significance in this interaction would indicate a previously undetected and unanticipated interaction relationship.

H-7: Hispanic students of both sexes, of all ages and of all areas of concentration have a similar attitude toward different ethical aspects of tax evasion.

This triple interaction is worthy of inclusion so that all interactions are evaluated. At this pint no existing theory is available that suggests a likelihood of significance of this triple interaction.

A three-way Multivariate Analysis of Variance (MANOVA) was conducted to examine how Hispanic students' attitude toward different ethical aspects of tax evasion (total 18) differed with student characteristics (gender, age and major) using the GLM analysis. A multivariate approach was chosen in order to control the Type I error and to detect combined differences that may not be evident from univariate tests (Hair, Anderson, Tatham & Black, 1995). Multivariate analysis of variance (MANOVA) analysis is an appropriate tool for similar scenarios where more than one dependent variable was identified. Furthermore, these dependent variables might indirectly influence each other since they all identify perceived conditions for tax evasion. MANOVA analysis also helps to overcome issues related to several dependant variables closely measuring the same outcome aspects. Therefore, MANOVA is the most suitable statistical tool, since it compares the groups and identifies whether the mean differences between the groups on the combination of dependent variables are likely to have occurred by chance.

However, before we proceeded with the MANOVA analysis, it was prudent to test whether our data conform to the following assumptions: Sample Size, Normality, Outliners, Linearity, Homogeneity of Regression, Multicollinearity and singularity and Homogeneity of variance-covariance matrices. The Bartlett's test of sphericity had a significance level at 0.001 ($\chi 2$ =4026.992, df =210, $p<0.05$), satisfying the necessary requirement of intercorrelation to justify MANOVA. An expanded table for Bartlett's Test of sphericity and Kaiser-Meyer-Olkin measure of Sampling Adequacy can be seen in Table 7.

The Pillai's Trace was chosen for significance testing, because it is more robust (Hair et al, 1995, p. 278). The multivariate tests of the three-way M ANOVA were first performed, followed by univariate tests of each measure of tax evasion ethics. Because relatively small sample sizes such as the one used here tend to make very small effects statistically significant, the alpha level for significance was set at the $p < .05$ level. Spearman's correlation coefficients were used to analyze the direction and the strength of the relationship between different variables. Parametric tests (independent samples t-test and ANOVA) were performed to examine differences in scores, for each attitude-based utility measures, as a result of various socio-demographic and other factors such as status, major, age, gender, education, country of residence, ethnicity, and religion and multiplelinear regression analysis was performed to determine the most significant predictors. Analysis of Variances (ANOVA) was chosen since it provides a more efficient method for analyzing data of relatively smaller population which involves several categorical variables.

RESULTS

Academic major was the only demographic variable where significant differences in opinion were found. For some of the 18 arguments justifying tax evasion, accounting students were significantly more averse to tax evasion than were business and economics majors. Some arguments justifying tax evasion were stronger than others. The strongest arguments for evading taxes were in cases where the government engaged in human rights abuses. Other strong arguments were in cases where the tax system was

perceived as unfair, where tax rates were too high, where government officials were corrupt or where tax funds were not spent wisely. Table 3 shows the ranking of the 18 arguments that were included in the survey instrument.

Table 3: Ranking of Arguments (1 = strongly agree; 7 = strongly disagree)

Rank	Statement number	Statement	N	Mean	S.D.
1	16	Tax evasion would be ethical if I were a victim of an oppressive regime or dictatorship similar to that in Stalinist Russia or Nazi Germany.	316	4.76	2.306
2	3	Tax evasion is ethical if the tax system is unfair.	319	4.86	2.185
3	18	Tax evasion is ethical if the government imprisons people for their political opinions.	317	4.91	2.315
4	17	Tax evasion is ethical if the government discriminates against me because of my religion, race or ethnic background.	316	4.96	2.297
5	11	Tax evasion is ethical if a significant portion of the money collected winds up in the pockets of corrupt politicians or their families and friends.	316	5.00	2.265
6	4	Tax evasion is ethical if a large portion of the money collected is wasted.	316	5.06	2.023
7	14	Tax evasion is ethical if I can't afford to pay.	316	5.24	2.059
8	6	Tax evasion is ethical if a large portion of the money collected is spent on projects that I morally disapprove of.	316	5.26	1.988
9	1	Tax evasion is ethical if tax rates are too high.	316	5.44	1.902
10	13	Tax evasion is ethical if some of the proceeds go to support a war that I consider to be unjust.	316	5.47	1.939
11	7	Tax evasion is ethical even if a large portion of the money collected is spent on worthy projects.	316	5.63	1.917
12	8	Tax evasion is ethical if a large portion of the money collected is spent on projects that do not benefit me.	316	5.64	1.876
13	5	Tax evasion is ethical even if most of the money collected is spent wisely.	316	5.71	1.860
14	9	Tax evasion is ethical even if a large portion of the money collected is spent on projects that do benefit me.	316	5.76	1.758
15	15	Tax evasion is ethical even if it means that if I pay less, others will have to pay more.	316	5.79	1.705
16	10	Tax evasion is ethical if everyone is doing it.	316	5.80	1.842
17	2	Tax evasion is ethical even if tax rates are not too high because the government is not entitled to take as much as it is taking from me.	316	5.81	1.616
18	12	Tax evasion is ethical if the probability of getting caught is low.	316	5.94	1.712
		Overall Mean	5.39		
		Median	5.46		
		Range	4.76 – 5.94		
		Cronbach's Alpha	.950		

The table shows the ranking for each argument as well as the statement number, the argument, the mean and the standard deviation. The bottom of the table lists the overall mean, the median, range and Cronbach's Alpha.

Factor analysis identified three groupings of responses. The group of arguments thought to provide the strongest justification for tax evasion all had to do with human rights abuses. The argument thought to be the strongest justification for tax evasion was the case of someone who lived under a dictatorship or other

oppressive regime. The other two human rights abuses statements involved the case of government imprisoning people for their political opinions and the case where government discriminates against people on the basis of religion, race or ethnic background.

The second group of arguments, which had the second highest grouping of mean scores, consisted of arguments involving fairness or morality. The strongest argument in this category was the case where the tax system was perceived as unfair. This response also correlated highly with the human rights arguments.

Other statements in the fairness and morality category included arguments to justify tax evasion in cases where tax funds wind up in the pockets of corrupt politicians or their friends and family; cases where tax funds are wasted; where there is inability to pay; where tax funds are spent on projects the taxpayer disapproves of; where tax rates are too high; and where tax funds are used to support an unjust war.

The category that had the least support for tax evasion included cases involving duty to the state. The argument that tax evasion is acceptable if the probability of getting caught is low was the least persuasive statement.

Other studies that used a similar survey instrument found similar relationships and rankings, which might lead one to conclude that the views on tax evasion of Mexicans living in the United States might not be too different from the views of Orthodox Jews (McGee & Cohn, 2008), Romanians (McGee, 2005b) or Poles (McGee & Bernal, 2006). However, such a conclusion would be premature. Although the rankings and relationships are similar, a comparison of mean scores found that the relative seriousness of tax evasion differed among studies.

The group most opposed to tax evasion in general, based on the overall mean score, was Orthodox Jews (McGee & Cohn, 2008: Mean = 5.57), followed by Mexicans living in Texas (Current study: Mean = 5.39). The group least opposed to tax evasion was the Romanian group (McGee, 2005b: Mean = 4.59), followed by the Polish sample (McGee & Bernal, 2006: Mean = 4.7). Thus, while one might say that the ranking of the various arguments that have been used to justify tax evasion might be similar across cultures, it would not be accurate to say that opinions on the seriousness of tax evasion are constant across cultures.

The results of multivariate tests presented in Table 4 showed that only "Major" ($F=1.843$, $p < 0.05$) had a significant relation with all aspects of tax evasion, thus H-2 is rejected H-1 and H-3 are not rejected.

Table 4: Results of the Three-way MANOVA Test

Source	*Pillai's Trace*	*F value*	*p value*
GENDER	0.092	1.228	0.24
AGE	0.053	0.679	0.83
MAJOR	0.262	1.843	.003*
GENDER *AGE	0.07	.915	.561
GENDER*MAJOR	0.223	1.534	.027**
AGE*MAJOR	0.211	1.441	0.051
GENDER*AGE*MAJOR	0.197	1.333	.099

*This table shows the Pillai's Trace, the F value and the p value for each demographic variable as well as for comparisons of two or three of the demographic variables. * Significant at 1-percent level. ** Significant at 5-percent level.*

Two-way interactions were significant for "Gender X Major" ($F=1.534$, $p < .05$) and marginally significant for "Age X Major" ($F=1.441$, $p = 0.51$). The three-way interaction of "Gender X Age X Major" was not significant ($F=1.333$, $p > 0.05$). and thus H-7 was not rejected.

Table 5 shows the statistics for the 18 statements and the demographic variables. Gender had the lowest frequency (N=294) among the demographic variables. Status with an N of 317 had the highest.
Table 5: Statements and Demographic Variables

	N Statistic	Range Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Error	Std. Deviation	Variance Statistic
S1	319	6	1	7	5.44	0.107	1.912	3.655
S2	319	6	1	7	5.8	0.091	1.632	2.664
S3	319	6	1	7	4.85	0.122	2.186	4.778
S4	319	6	1	7	5.04	0.114	2.028	4.111
S5	318	6	1	7	5.71	0.104	1.855	3.442
S6	319	6	1	7	5.25	0.112	1.993	3.973
S7	319	6	1	7	5.62	0.108	1.927	3.715
S8	318	6	1	7	5.62	0.106	1.889	3.567
S9	319	6	1	7	5.75	0.099	1.772	3.14
S10	319	6	1	7	5.79	0.104	1.854	3.439
S11	319	6	1	7	4.97	0.127	2.276	5.182
S12	319	6	1	7	5.93	0.097	1.727	2.983
S13	319	6	1	7	5.46	0.109	1.947	3.79
S14	319	6	1	7	5.24	0.116	2.068	4.276
S15	318	6	1	7	5.78	0.097	1.723	2.967
S16	319	6	1	7	4.76	0.129	2.31	5.335
S17	319	6	1	7	4.96	0.129	2.299	5.287
S18	319	6	1	7	4.91	0.13	2.318	5.372
Status	317	5	1	6	1.91	0.027	0.478	0.229
Major	311	5	1	6	2.2	0.09	1.585	2.513
Gender	294	1	1	2	1.53	0.029	0.5	0.25
Age	287	3	1	4	1.39	0.038	0.648	0.42
Residence	313	1	1	2	1.88	0.018	0.323	0.105
Ethnicity	306	5	1	6	2.02	0.028	0.485	0.236
Religion	311	5	1	6	1.43	0.064	1.122	1.259

This table lists the sample size, range, mean, standard error, standard deviation and variance for each of the 18 statements as well as the demographic variables that were examined.

Table 6 shows the composition of the various demographic variables. There are more females (57%) than males (43%) Age data revealed that 36.2 per cent of the students were 25 years or older highlighting a large amount of non-traditional students. Accounting majors were 38.7 per cent of the students surveyed, with 43.2 percent of the students studying business—economics, with "others" at 19.1 per cent. Use of the KMO measure and the Bartlett's test confirmed the presence of an adequate sample.

The authors then performed respective univariate tests to determine the relations of the "Gender*Major" variables with each aspect of tax evasion. Table 7 shows the univariate tests results for gender and major for statements 4, 5, and 11. According to the outcomes of univariates tests, results are significant with respect to the statements of "Tax evasion is ethical if a large portion of the money collected is wasted" ($F=3.364$, $p < 0.05$) (Table 7) and "Tax evasion is ethical if a large portion of the money collected is spent wisely" ($F=4.210$, $p < 0.05$) (Table 7). There are significant differences between accounting majors and business-economics majors in their approach to those issues.

Table 6: Demographic Variables

	Frequency	Percent	Valid Percent	Cumulative Percent
Gender				
Valid Male	108	39.9	43.0	43.0
Female	143	52.8	57.0	100.0
Total	251	92.6	100.0	
Missing/System	20	7.4		
Total	271	100.0		
Age				
Under 25	173	63.8	63.8	63.8
25 Or Older	98	36.2	36.2	100.0
Total	271	100.0	100.0	
Major				
Accounting	105	38.7	38.7	38.7
Business-Economics	117	43.2	43.2	81.9
Others	49	18.1	18.1	100.0
Total	271	100.0	100.0	
Kmo And Bartlett's Test				
Kaiser-Meyer-Olkin Measure of Sampling Adequacy			0.931	
Bartlett's Test of Sphericity	Approx. Chi-Square		4026.992	
	Df		210.000	
	Sig.		.000*	

This table shows the sample size, percentages, valid percentages and cumulative percentages for the gender, age and major demographic variables, as well as the statistics for the KMO and Bartlett's Test.
** Significant at 5-percent level.*

Table 7 – Multiple Comparisons/Univariate Test Results (Gender & Major)

(I) Major	(J) Major	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
S4: Tax evasion is ethical if a large portion of the money collected is wasted.						
Accounting	Bus – Econ	1.37	.261	.000*	.76	1.99
	OTHERS	.81	.396	.101	-.12	1.75
Bus – Econ	Accounting	-1.37	.261	.000*	-1.99	-.76
	Others	-.56	.391	.331	-1.48	.37
Others	Accounting	-.81	.396	.101	-1.75	.12
	Bus – Econ	.56	.391	.331	-.37	1.48
S5: Tax evasion is ethical even if most of the money collected is spent wisely.						
Accounting	Bus – Econ	.97	.241	.000*	.40	1.54
	Others	.43	.364	.470	-.43	1.29
Bus – Econ	Accounting	-.97	.241	.000*	-1.54	-.40
	Others	-.54	.360	.294	-1.39	.31
Others	Accounting	-.43	.364	.470	-1.29	.43
	BUS – ECON	.54	.360	.294	-.31	1.39
S11: Tax evasion is ethical if a significant portion of the money collected winds up in the pockets of corrupt politicians or their families						
ACCOUNTING	Bus – Econ	1.13	.306	.001*	.41	1.85
	Others	.73	.463	.262	-.37	1.82
BUS – ECON	Accounting	-1.13	.306	.001*	-1.85	-.41
	Others	-.40	.458	.655	-1.48	.68
OTHERS	Accounting	-.73	.463	.262	-1.82	.37
	Bus – Econ	.40	.458	.655	-.68	1.48

*This table shows the results for the multiple comparison / univariate test results for Statements 4, 5 and 11 for gender and major. There are separate columns for major, mean differences, standard error, significance and confidence level. * Significant at the 1 percent level.*

Furthermore, the results are marginally significant for the statement "Tax evasion is ethical even if a large portion of the money collected is spent on projects that do benefit me" (F=2.946, p=.055) (Table 7). To identify the nature of the differences between groups, the study performed a 2-way ANOVA treating the tax evasion statements mentioned above as dependent variables against "Major" and "Gender" status as independent variables.

Table 8 – Multiple Comparisons/Univariate Test Results (Age & Major)

(I) Major	(J) Major	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
S5: Tax evasion is ethical even if most of the money collected is spent wisely.						
ACCOUNTING	BUS – ECON	.96	.250	.000*	.37	1.55
	OTHERS	.88	.322	.018**	.12	1.64
BUS – ECON	ACCOUNTING	-.96	.250	.000*	-1.55	-.37
	OTHERS	-.08	.317	.968	-.82	.67
OTHERS	ACCOUNTING	-.88	.322	.018**	-1.64	-.12
	BUS – ECON	.08	.317	.968	-.67	.82
S7: Tax evasion is ethical even if a large portion of the money collected is spent on worthy projects.						
ACCOUNTING	BUS – ECON	.94	.255	.001*	.33	1.54
	OTHERS	.77	.329	.053	.00	1.54
BUS – ECON	ACCOUNTING	-.94	.255	.001*	-1.54	-.33
	OTHERS	-.17	.323	.858	-.93	.59
OTHERS	ACCOUNTING	-.77	.329	.053	-1.54	.01
	BUS – ECON	.17	.323	.858	-.59	.93
S9: Tax evasion is ethical even if a large portion of the money collected is spent on projects that do benefit me.						
ACCOUNTING	BUS – ECON	1.00	.233	.000*	.45	1.55
	OTHERS	.43	.299	.319	-.27	1.14
BUS – ECON	ACCOUNTING	-1.94	.233	.000*	-1.55	-.45
	OTHERS	-.57	.294	.135	-1.26	.13
OTHERS	ACCOUNTING	-.43	.299	.319	-1.14	.27
	BUS – ECON	.57	.294	.135	-.13	1.26

*This table shows the results for the multiple comparison / univariate test results for Statements 5, 7and 9 for age and major. There are separate columns for major, mean differences, standard error, significance and confidence level. * Significant at the 1 percent level. ** Significant at the 5 percent level.*

According to the results of *Tukey's* honest significance test (HSD) (Table 7) there are significant differences between accounting majors and business/economics majors with respect to both when tax evasion being ethical if money is wasted and money has been spent wisely. According to the table of multiple comparisons of mean differences, accounting students are less prone to tax evasion than their business major counterparts under those conditions. Furthermore, there are marginally significant differences ($p<0.05$) between accounting majors and business-economics majors in the perception of tax evasion being ethical if a significant portion the money collected winds up in the pockets of corrupt politicians or their families and friends.

As it was mentioned above, according to the results of multivariate Tests (Pillai's trace: F=1.441, p = 0.51) there are some marginally significant results with respect to Age X Major. Table 8 shows the comparisons and univariate results for age and major for statements 5, 7 and 9. According to the outcome of univariate tests results are significant with the respect to "Tax evasion is ethical if a large portion of the money collected is spent wisely" (F=3.175, $p < 0.05$) (Table 7), "Tax evasion is ethical if a large portion of the money collected is spent on worthy projects" (F=3.444, $p < 0.05$) (Table 7) and "Tax evasion is ethical if a large portion of the money collected is spent on projects that do benefit me" (F=4.961, $p < 0.05$) (Table 7). According to the results of 2-way ANOVA (tax evasion statements mentioned above as dependent variables against "Major" and "Age" status as independent variables), in Hispanic population, accounting major students are more cautious than their business-economics counterparts when it comes to specific tax evasion issues outlined above.

A number of studies have been done on gender ethics. Some studies found that women were more ethical than men (Akaah, 1989; Betz et al., 1989; Glover et al., 1997), while other studies found no significant differences between male and female views on ethical issues (Babakus et al., 2004; Dubinsky & Levy, 1985; Kidwell et al., 1987). A few studies have found men to be more ethical than women (Barnett & Karson, 1987; Weeks et al., 1999). In cases where women are found to be more ethical, possible explanations that have been given are that women are taught to respect authority and that they are more caring and nurturing, and are thus more sensitive to harming others. In cases where there is no statistically significant difference between men and women, one reason that has been given is that, as women become more equal with men, their attitudes become more like those of men. If those reasons are valid, one might reasonably conclude that Mexican women have been sufficiently liberated to have views on tax evasion that are similar to those of Mexican men. The literature is unclear on why men might be more ethical than women.

A philosophical word of caution needs to be given here, however. If one states that women are more opposed to tax evasion, it is not the same as saying that women are more ethical than men. In order to arrive at that conclusion, one must begin with the underlying premise that tax evasion is unethical, which may or may not be the case. For example, a strong case could be made that it is not unethical for Jews living in Nazi Germany to evade taxes. There is also a great deal of support for the argument that tax evasion is not unethical if the government engages in human rights abuses or if the government is engaged in an unjust war. In the present study, men's and women's views on tax evasion were not significantly different, but that is not quite the same as saying that men and women are equally ethical when it comes to tax evasion. All that can be said is that their views on tax evasion do not differ significantly.

Where gender differences have been tested in tax evasion studies the results are mixed. Women were found to be significantly more opposed to tax evasion in studies of Orthodox Jews (McGee & Cohn, 2008) and international business academics (McGee, 2005a), whereas men were found to be significantly more opposed to tax evasion in a study of Romanian business students (McGee, 2005b). Differences between male and female views were found to be statistically insignificant in studies of Polish (McGee & Bernal, 2006) and Chinese (McGee & Noronha, 2008) students.

Ethical studies that examined age as a variable have generally found that people become more ethical with age, or that people tend to have more respect for authority as they get older (Barnett & Karson, 1987, 1989; Longenecker et al., 1989; Harris, 1990; Kelley et al., 1990; Ruegger & King, 1992). However, Marta et al. (2004) found that age does not affect views on ethics in the Middle East.

The present study found that ethical views on tax evasion do not differ significantly based on age. This finding seemingly contradicts the finds of the studies cited above. However, the sample in the present study consisted of people who were mostly young, so age comparisons had to be made between two

groups that were both mostly young. Thus, one can conclude that age is not a significant demographic in cases where young students are sampled.

The present study found that accounting majors are sometimes significantly more opposed to tax evasion than are business and economics students, depending on the issue. This finding is not surprising, since accounting students are taught how to comply with the tax laws and are taught to follow accounting and tax rules in their various courses. However, a study of Estonian students found that the difference between accounting and business and economic student mean scores was not significant (McGee, Alver & Alver, 2008). Thus, it cannot be stated categorically that accounting students are always more opposed to tax evasion than business and economics students.

A few other tax evasion studies have included academic major as a demographic variable. An Armenian study (McGee & Maranjyan, 2008) found that business and economics students were more opposed to tax evasion than were theology students. The reason given for this surprising result was that theology is a business in Armenia.

An Australian study (McGee & Bose, 2009) found that business and economics students were least opposed to tax evasion; seminary students were most opposed; Business and economics students were significantly less opposed to tax evasion than were philosophy, accounting, health services and seminary students. Accounting majors were significantly more opposed to tax evasion than were business & economics, and information technology students and were significantly less opposed to tax evasion than were seminary and health services students.

CONCLUDING COMMENTS

To better deal with tax evasion we need to understand the root causes of tax evasion and the reasons why people evade taxes. The goal of this study was to determine the strength of various arguments that have been used to justify tax evasion in the past and to determine whether results differ based on certain demographic variables. It was found that some arguments that have been used historically to justify tax evasion are stronger than others and that academic major is correlated with views on tax evasion in some cases.

Data was gathered by distributing a survey to Hispanic business students at a university in South Texas. The survey instrument contained 18 statements that had been used to justify tax evasion in the past. A number of statistical tests were conducted to determine which arguments justifying tax evasion were the strongest. The statements were then ranked by mean score. Further statistical tests were made to determine whether gender, age or academic major made a difference in opinion.

It was found that the strongest arguments for justifying tax evasion have to do with government abuses and corruption and the belief that the tax system is unfair. From a policy perspective, one might conclude that the way to minimize tax evasion would be to have less government abuses and corruption and more fairness and equity in the tax system.

Gender, age and academic major were examined to determine whether these demographic variables contained significant differences between groups. The study found that only academic major had significant differences. Accounting majors were in some cases significantly more opposed to tax evasion than business and economics students. However, in other cases the differences were not significant.

The Hispanic component of the American population is growing rapidly and it is expected to continue its rapid growth indefinitely. Our research finds that Hispanic accounting majors are more ethical in regards to tax evasion than other business and economics majors. More research is needed to determine if this is

because of the unique and specific training accounting majors get or if it is because more ethical persons self select to become accounting majors. For example, the risk-reward ratio is different for a paid tax return preparer who must sign a return than the actual taxpayer who may reap the full economic benefit of successful tax evasion. Hence, it is important to know if there is a lack of sufficient financial motivation for accounting majors to evade taxes or if there is different ethical reasoning involved that is based on education or self selection.

Future research could explore the willingness of non-Hispanic groups in the U. S. to evade taxes and also the reasoning behind their decision to evade taxes to determine whether significant differences exist in their ethical attitudes toward tax evasion. Comparisons could be made between Hispanic and non-Hispanic groups to see if there is any difference in viewpoint based on ethnicity.

The present study has some limitations. Since students were surveyed, there is always a question of whether the results of the study can be generalizable to the total population. Perhaps students think differently than their parents. Also, since students are generally younger than the general population, student surveys do not include the views of older people. In addition, since the sample population consisted of individuals who are better educated than a major segment of the general population, there is always the possibility that people who have different educational levels might have different opinions on the ethics of tax evasion. These limitations are present in all student surveys. However, hundreds of studies have used student populations and it is an accepted methodology. A sample that included older people and nonstudents might have found different results. Such a study could serve as a logical expansion of the present study.

The Hispanics surveyed in the present study were from South Texas. Hispanics in this region of the United States are mostly of Mexican origin. It is likely that Hispanics from California, Arizona and New Mexico would have similar views on tax evasion, since Hispanics in those states also tend to be of Mexican background, but this assumption could be tested. Perhaps the Mexicans in these states have different attitudes toward tax evasion, but one may only assume a similar attitude until these samples are tested.

Another possible study would involve comparing Texas Hispanics of Mexican origin with Mexicans who live in Mexico. It is possible that living in the United States has caused Texas-based Mexicans to have opinions that differ from those of Mexicans still living in Mexico.

Another fertile ground for further research would be to compare Hispanics who have different countries of origin. Most Hispanics who live in the Southwestern United States are of Mexican origin but many Hispanics who live in other states do not have their origins in Mexico. For example, the Hispanics who live in South Florida are predominantly of Cuban origin, although several other Latin American countries are also represented. Hispanics who live in the New York metropolitan area have roots in Puerto Rico, the Dominican Republic and other Latin American countries. It is entirely possible that the views of Hispanics in South Florida or New York might differ significantly from the Hispanics in the Southwestern United States, but their relative views have not yet been tested and compared.

APPENDIX

Appendix 1: Survey Instrument

Instructions: Tax evasion is defined as the illegal nonpayment of a tax. Tax avoidance, on the other hand, occurs when someone finds a way to legally minimize or reduce taxes. Please answer the following questions dealing with the ethics of tax evasion. If you would like to receive a copy of the results of this survey, please send an e-mail to Arsen M. Djatej at arsen@tamiu.edu

Instrucciones: Jesús dijo que debíamos dar al César lo que es del César y a Dios lo que es de Dios, pero no entró en detalles con respecto a cuánto hay que darle al César. Conteste, por favor, las siguientes preguntas que tratan del aspecto ético de la evasión de Impuestos. Si ya contestó este cuestionario en otra clase, no vuelva a contestarlo. Si le interesaría recibir una copia del resultado de esta encuesta, escriba al Arsen M. Djatej at arsen@tamiu.edu solicitándola. Incluya su dirección electrónica en la carta.

The Ethics of Tax Evasion-La Ética De La Evasión De Impuestos

Please insert the appropriate number in the space provided for the following statements.

1_____2_____3_____4_____5_____6_____7
Strongly Agree — Strongly Disagree

Escriba el número apropiado al lado de cada aseveración.

1_____2_____3_____4_____5_____6_____7
Completamente de acuerdo — Completamente en desacuerdo

1._____Tax evasion is ethical if tax rates are too high. La evasión de impuestos es ética si las tasas de impuestos son demasiado altas.

2._____Tax evasion is ethical even if tax rates are not too high because the government is not entitled to take as much as it is taking from me. La evasión de impuestos es ética aunque las tasas de impuesto no sean muy elevadas.

3._____Tax evasion is ethical if the tax system is unfair. La evasión de impuestos es ética si el sistema fiscal es injusto.

4._____Tax evasion is ethical if a large portion of the money collected is wasted. La evasión de impuestos es ética si gran parte de los fondos recaudados se malgasta.

5._____Tax evasion is ethical even if most of the money collected is spent wisely. La evasión de impuestos es ética aunque la mayor parte de los fondos recaudados sea usada de manera prudente.

6._____Tax evasion is ethical if a large portion of the money collected is spent on projects that I morally disapprove of. La evasión de impuestos es ética si gran parte de los fondos recaudados se usa en proyectos con los cuales yo no estoy moralmente de acuerdo.

7._____Tax evasion is ethical even if a large portion of the money collected is spent on worthy projects. La evasión de impuestos es ética aunque gran parte de los fondos recaudados se use en proyectos encomiables.

8._____Tax evasion is ethical if a large portion of the money collected is spent on projects that do not benefit me. La evasión de impuestos es ética si gran parte de los fondos recaudados se usa en proyectos que no me benefician.

9._____Tax evasion is ethical even if a large portion of the money collected is spent on projects that do benefit me. La evasión de impuestos es ética si gran parte de los fondos recaudados se usa en proyectos que me benefician.

10._____Tax evasion is ethical if everyone is doing it. La evasión de impuestos es ética si todo el mundo participa en ella.

11._____Tax evasion is ethical if a significant portion of the money collected winds up in the pockets of corrupt politicians or their families and friends. La evasión de impuestos es ética si gran parte de los fondos recaudados termina en los bolsillos de políticos corruptos o de sus familiares y amigos.

12._____Tax evasion is ethical if the probability of getting caught is low. La evasión de impuestos es ética si hay pocas probabilidades de ser descubierto.

13._____Tax evasion is ethical if some of the proceeds go to support a war that I consider to be unjust. La evasión de impuestos es ética si algunas de las ganancias se utilizan para respaldar una guerra que yo considero injusta.

14._____Tax evasion is ethical if I can't afford to pay. La evasión de impuestos es ética si yo no puedo pagar los impuestos.

15._____Tax evasion is ethical even if it means that if I pay less, others will have to pay more. La evasión de impuestos es ética aunque implique que si yo pago menos otros tendrán que pagar más.

16._____Tax evasion would be ethical if I were a victim of an oppressive regime or dictatorship similar to that in Stalinist Russia or Nazi Germany. Considera usted que la evasion impositiva es etica cuando el gobierno es opresivo como en la Dictadura Stalinista en Rusia o en la Dictadura Nazi en Alemania.

17._____ Tax evasion is ethical if the government discriminates against me because of my religion, race or ethnic background. La evasión de impuestos es ética si sufro discriminación por parte del gobierno debido a mi religión, raza o grupo étnico.

18._____ Tax evasion is ethical if the government imprisons people for their political opinions. La evasión de impuestos es ética si el gobierno encarcela a las personas por sus puntos de vista políticos.

I am a(n): ___graduate student ___undergraduate student

___faculty member ___other_____

Soy ___estudiante graduado ____estudiante no-graduado

___miembro de la facultad ____otro_____

My main area of study is _____accounting _____business/economics

_____theology/religious studies ____philosophy _____law

____other (specify)_____

Mi área de estudio principal es: ____contabilidad ____negocios/economía

____teología/estudios religiosos ____filosofía ____leyes

I am ____male _____female Sexo: ___Masculino ___Femenino

I am ____under 25 _____25-40 ____over 40 Edad: ___<25 ____25-40 ____>40

I currently reside/live/commute in(from) Mexico_____
Vivo en Mexico

I currently reside/live/commute in(from) USA_____
Vivo en EEUU

I live in Mexico but work in the USA_____
Vivo en Mexico y trabajo en EEUU

I am __Non-Hispanic white ___Hispanic ____African-American ____Asian ____Other
Soy ___No-Hispano blanco ___Hispano _____Afro-Americano ____Asiatico
____Otro

I am ____Catholic ____Other Christian (specify denomination)_____

____Jewish _____Muslim _____None/Atheist/Agnostic

____Other (specify)_____

Soy ____Catolico ____Otro Cristiano(especifique la denominacion)_____

____Yodio ____Musulman ____Ningono/Ateo/Agnostico

___Otro (especifique)_____

(Optional Comments) What are your views on the ethics of tax evasion? What determines whether tax evasion is ethical or unethical? You may use the back of this questionnaire if you need more space.

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A COMPARISON OF GRADIENT ESTIMATION TECHNIQUES FOR EUROPEAN CALL OPTIONS

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ABSTRACT

Assuming the underlying assets follow a Variance-Gamma (VG) process, we consider the problem of estimating gradients of a European call option by Monte Carlo simulation methods. In this paper, we compare indirect methods (finite difference techniques such as forward differences) and two direct methods: infinitesimal perturbation analysis (IPA) and likelihood ratio (LR) method. We conduct simulation experiments to evaluate the efficiency of different estimators and discuss the advantage and disadvantage of each method.

JEL: G13, G15, G17

KEYWORDS: Greeks, IPA, LR, Variance-Gamma

INTRODUCTION

Gradients estimates have been useful in hedging risks in markets in the finance community. Thus many techniques of calculation of gradients including direct methods and indirect methods have been broadly developed. Many studies have been obtained to study the gradients of estimation under a geometric Brownian motion (GBM) model. However, the GBM model has some imperfections in illustrating the statistical properties of empirical results of market prices. In this paper, we assume stock prices follow a Variance-Gamma (VG) process and develop gradient estimates of a European call option under this assumption. The Variance Gamma process is one of the Levy processes, which are determined by a random time change. It is a pure-jump process with finite moments and no diffusion component. The VG process has been studied in a vast literature and empirical evidence shows that it can yield much better fits to stock prices than the geometric Brownian motion process.

In this paper, we first price a European call option and then turn to gradient estimation to calculate the Greeks by indirect method: forward difference (FD), the direct methods of IPA and LR. Finally, an analysis of the strengths and weakness of each method is provided. The remaining of this paper is organized as follows. A literature review of gradient estimation techniques and Variance Gamma processes are first provided. Then, the introduction of Greeks which is also called the sensitivities of options is shown. In the third part, details of VG processes, as well as gradient estimation techniques including forward direct method (FD), IPA and LR are provided. Furthermore, gradient estimators of Greeks of options under the VG model are shown. Finally, a numerical experiment of estimating Greeks of a European call option is conducted using estimators we calculated. In the last section, analysis of results from the numerical experiment is provided.

LITERATURE REVIEW

A Variance Gamma (VG) Process was introduced to the finance community as a model for log-price returns and option pricing by Madan and Seneta (1990). Madan and Milne (1991) consider equilibrium option pricing for a symmetric variance gamma process in a representative agent model; while Madan, Carr and Chang (1998) develop the method of pricing options by a Variance Gamma process. Fu (2007) gives a general introduction to the VG process in the context of stochastic (Monte Carlo) simulations and

shows how to price and simulate stock prices. Cao and Fu (2010) estimate Greeks of Mountain Range options with respect to a Variance Gamma process.

The Greeks in the definition of finance community are the quantities representing the sensitivities of the price of derivatives such as options to a change in underlying parameters on which the value of an instrument or portfolio of financial instruments is dependent. Each Greek letter measures the sensitivity of option prices to stock prices, thus it has been broadly applied in hedging risks. For example, "Delta" is necessary for delta hedging, see Cao and Guo (2011-3) employ deltas under a Black-Scholes model to estimate hedging profits. Cao and Guo (2001-2) analyze hedging profits from delta hedging under a VG model and a Black-Scholes model; while Cao and Guo (2011-4) compare results from delta hedging of a European call option w.r.t. a VG process and a geometric Brownian motion (GBM), respectively, using deltas by IPA method. The Greeks can also be employed to conduct other hedging strategies such as Gamma hedging etc., of which are introduced in Hull (2003).

Gradient estimation technique is a widely used technique to calculate the Greeks. It was first applied to option pricing using infinitesimal perturbation analysis (IPA) for both European and American options by Fu and Hu (1995). Then, both IPA and LR methods are applied in Broadie and Glasserman (1996) to European and Asian option with respect to (w.r.t.) Geometric Brownian motion; see also Glasserman (2004) reviews various Monte Carlo Methods for financial engineering. Fu (2007) reviews various methods of gradient estimation in stochastic simulation, including both direct and indirect methods; see also Fu (2008) reviews techniques and applications to derivative securities. Cao and Guo (2011-1) employ the estimation techniques to estimate gradients of a European call option following a VG model.

VARIANCE-GAMMA PROCESS

The Variance Gamma Process is a Levy process, which is of independent and stationary increments. There are two ways to define a VG process:

First, a VG process can be defined as Gamma-time-changed Brownian motion with the subordinator being a gamma process, say GVG. Let W_t denote the standard Brownian motion, $B_t^{(\mu,\sigma)} = \mu t + \sigma W_t$ denote the Brownian motion with constant drift rate μ and volatility σ, $\gamma_t^{(v)}$ be the gamma process with drift $\mu = 1$ and variance parameter v. The representation of the VG process is:

$$X_t = B^{(\theta,\sigma)}_{\gamma_t^{(v)}} = \theta\gamma_t^{(v)} + \sigma W_{\gamma_t^{(v)}}. \tag{1}$$

Second, the VG process is the difference of two gamma processes, say DVG. Let $\gamma_t^{(\mu,v)}$ be the gamma process with drift parameter μ and variance parameter v, the representation of the VG process as difference of gamma process is:

$$X_t = \gamma_t^{(\mu_+,v_+)} - \gamma_t^{(\mu_-,v_-)}, \tag{2}$$

where $\mu_\pm = \left(\sqrt{\theta^2 + \frac{2\sigma^2}{v}} \pm \theta\right)/2$, and $v_\pm = \mu_\pm^2 v$.

Under the risk-neutral measure, with no dividends and constant risk-free interest rate r, the stock price is given by $S_t = S_0 \exp\big((\gamma + w)t + X_t\big)$, where $\omega = \ln\left(1 - \theta v - \frac{\sigma^2 v}{2}\right)/v$ is the parameter that makes the discounted asset price a martingale.

The density function of the log-price $Z = \ln(\frac{S_t}{S_0})$ as proposed by Madan and Seneta (1990) is:

$$h(z) = \frac{2\exp\left(\frac{\theta x}{\sigma^2}\right)}{v^{\frac{t}{v}}\sqrt{2\pi}\sigma\Gamma\left(\frac{t}{v}\right)}\left(\frac{x^2}{\frac{2\sigma^2}{v}+\theta^2}\right)^{\frac{t}{2v}-\frac{1}{4}} K_{\left(\frac{t}{v}-\frac{1}{2}\right)}\left(\frac{1}{\sigma^2}\sqrt{x^2\left(2\frac{\sigma^2}{v}+\theta^2\right)}\right) \quad (3)$$

where K is the modified Bessel function of 2nd kind, and $x = z - rt - \frac{t}{v}\ln\left(1-\theta v-\frac{\sigma^2 v}{2}\right)$.

GREEKS

Greeks are quantities representing sensitivities of derivatives, such as options, see Hull (2003). Each Greek letter measures a different dimension to the risk in an option position and the aim of a trader is to manage the Greeks so that all risks are acceptable. In this paper, we study the Greeks such as Delta, Rho and Theta defined in the following:

Delta: Δ is defined as the rate of change of the option price w.r.t. the underlying asset price. It is the slope of the curve that relates the option price to the underlying asset price. In general, $\Delta = \frac{\partial V}{\partial S}$.

Vega: v is the rate of change of the value of the portfolio of option w.r.t. the volatility of the underlying asset price. It measures the sensitivity of the value of a portfolio to the volatility, i.e., $v = \frac{\partial V}{\partial \sigma}$.

Rho: ρ is the rate of change of the value of the portfolio of option w.r.t. the interest rate. It measures the sensitivity of the value of a portfolio to interest rates. It is defined as: $\frac{\partial V}{\partial r}$.

Theta: θ is the rate of change of the value of the portfolio of option w.r.t. the passage of time with all else remaining the same. It measures the sensitivity of the value to the passage of time. It is defined as: $\theta = \frac{\partial V}{\partial t}$

GRADIENT ESTIMATION TECHNIQUE

In this paper, we focus on calculating gradient estimates of the price of a European call option depending on various parameters of a VG model. We then calculate the derivatives of the price with respect to these parameters separately.

We begin with $J(\xi)$, the objective function which depends on the parameterξ, and calculate $\frac{dJ(\xi)}{d\xi}$.

Suppose the objective function is an expectation of the sample performance measure L, that is:

$$J(\xi) = E[L(\xi)] = E[L(X;\xi)] \quad (4)$$

Where X is dependent on ξ. By the law of the unconscious statistician, the expectation can be written as:

$$E[L(X)] = \int y dF_L(y) = \int L(x) d F_X(x), \quad (5)$$

where F_L is the distribution of L and F_X is the distribution of input random variables X.

Indirect Methods

The indirect method of estimating a gradient at ξ is simply to use finite difference, i.e., perturbing the value of each component of ξ separately while holding all the other components still.

The one-sided forward difference gradient estimator in the i-th direction is: $\frac{\hat{J}(\xi+c_i e_i)-\hat{J}(\xi)}{c_i}$, where c_i is the scalar perturbation in the i-th direction and e_i is the unit vector in the i-th direction.

Direct Methods (IPA and LR)

IPA estimates require the integrability condition which is easily satisfied when the performance function is continuous with respect to the given parameter. Assume we can interchange the expectation and differentiation, the IPA estimate is:

$$\frac{dE[L(X)]}{d\xi} = E\left[\frac{dL(X)}{d\xi}\right] = \int_0^1 \frac{dL}{dX}\frac{dX(\xi)}{d\xi}du, \tag{6}$$

and the estimator is:

$$\frac{dL}{dX}\frac{dX(\xi)}{d\xi} \tag{7}$$

From the Lebesgue dominated convergence theorem, the condition of uniform integrability of $\frac{dL}{dX}\frac{dX(\xi)}{d\xi}$ must be satisfied to make the interchangeability.

For LR, the probability density function f of X is differentiable. The Likelihood Ratio method is:

$$\frac{dE[L(X)]}{d\xi} = \int_{-\infty}^{+\infty} L(x)\frac{df(x,\xi)}{d\xi}dx = \int_{-\infty}^{+\infty} L(x)\frac{dlnf(x,\xi)}{d\xi}f(x)dx$$

and the estimator is

$L(x)\frac{dlnf(x,\xi)}{d\xi}f(x)$, where $\frac{dlnf(x,\xi)}{d\xi}$ is the score function. From the Lebesgue dominated convergence theorem, the condition of uniform integrability of $L(x)\frac{dlnf(x,\xi)}{d\xi}f(x)$ must be satisfied to make the interchangeability. We employ indirect methods (FD) and direct methods (IPA and LR) to calculate the gradient estimation in the following paper.

GRADIENTS OF A EUROPEAN CALL OPTION

Call option gives the buyer the right, not the obligation to buy certain amount of financial instrument from the seller at a certain time for a certain price. The payoff function of the European call option with expiring time T, strike price K and risk free interest rate r is: $V_T = e^{-rT}(S_T - K)^+$, where $S_T = S_0\exp((r+\omega)T + X_T)$, and X_T follows the VG process. We have 2 different ways to represent the VG process X_T as in Equation (2) and Equation (3). We estimate the Greeks in these two ways.

IPA for a European Call Option

The gradient w.r.t T does not satisfy the condition of interchangeability, which means IPA method can not be applied to this gradient. The estimators for other gradients of a European call option for IPA method are as follows:

Table 1: IPA Estimators for European Call options

Greek	IPA Estimators
Delta	$\frac{dV_T}{dS_0} = e^{-rT} I_{\{S_T>k\}} \frac{dS_T}{dS_0}$
Rho	$\frac{dV_T}{dr} = -Te^{-rT}(S_T - K)^+ + e^{-rT} I_{\{S_T>k\}} \frac{dS_T}{dr}$.
Vega	$\frac{dV_T}{d\sigma} = e^{-rT} I_{\{S_T>k\}} \frac{dS_T}{d\sigma}$.
Theta	$\frac{dV_T}{dT} = -re^{-rT}(S_T - K)^+ + e^{-rT} I_{\{S_T>k\}} \frac{dS_T}{dT}$
Gradient w.r.t. θ	$\frac{dV_T}{d\theta} = e^{-rT} I_{\{S_T>k\}} \frac{dS_T}{d\theta}$

Notes: This table shows the IPA estimates for European call options by assuming the stock price follows a Variance-Gamma process. The Variance-Gamma process could be a GVG or DVG process. Delta denotes the gradient with respect to the spot price S_0. Rho denotes the gradient with respect to the risk-free interest rate r. Vega denotes the gradient with respect to σ. Theta denotes the gradient with respect to the maturity time$T$.

LR for a European Call Option

Since the density doesn't contain S_0 or r, we could not use LR to estimate vega and rho. The gradient w.r.t. θ does not satisfy the condition of interchangeability, which means LR method can not be applied to this gradient. The other gradients could be calculated as follows:

Table 2: LR Estimators for European Call options

Greek	LR Estimators
Gradient w.r.t. σ	$\frac{d\,E[V_T]}{d\sigma} = \int_0^\infty e^{-rT}(S_0 e^Z - K)^+ \frac{dlnh(z)}{d\sigma} h(z)dz$
Theta (Gradient w.r.t. T)	$\frac{d\,E[V_T]}{dT} = \int_0^\infty e^{-rT}(S_0 e^Z - K)^+ (-r + \frac{dlnh(z)}{dT}) h(z)dz$

Notes: This table shows the LR estimates for European call options by assuming the stock price follows a Variance-Gamma process. The Variance-Gamma process could be a GVG or DVG process. T denotes the maturity time.

Numerical Experiment

Using the formulas of estimators above, we apply Monte Carlo to do the estimation from 10000 sample paths. With $K = 10, r - \delta = 0.057,\ v = 0.2686,\ \theta = 0.1436, \sigma = 0.1213$ and $T = 0.2$. We get the numerical results in the table below:

Table 3: Numeral Results of Gradients

GVG	Delta	Rho	Vega	$\frac{dV_T}{dT}$	$\frac{dV_T}{d\theta}$
FD	0.4746	0.9010	1.3703	0.6443	0.4713
StdErr	0.0052	0.0097	0.0349	0.6559	0.0212
IPA	0.4707	0.8862	1.3578		0.4621
StdErr	0.0052	0.0098	0.0349		0.0211
LR			1.7603	0.7012	
StdErr			0.2036	0.0236	
DVG					
FD	0.4794	0.9100	1.3883	0.5942	0.5022
StdErr	0.0052	0.0097	0.0320	0.7987	0.0171
IPA	0.4746	0.8925	1.1200		0.5512
StdErr	0.0052	0.0098	0.0013		0.0120
LR			1.3651	0.6792	
StdErr			0.1688	0.0317	

Notes: This table shows the mean values and standard errors of results of all Greeks for European call options by assuming the stock price follows a Variance-Gamma process. The Variance-Gamma process could be a GVG or DVG process. GVG is the Gamma-time-changed Brownian motion. DVG is the difference of two Gamma processes. We apply the results of estimating Greeks by three methods FD, IPA and LR. FD denotes the forward difference method, LR denotes the LR method. StdErr denotes the standard error of the simulation results. Delta denotes the gradient with respect to the spot price S_0. *Rho denotes the gradient with respect to the risk-free interest rate* r. *Vega denotes the gradient with respect to* σ. *Panel A shows the results under a GVG process; Panel B shows the results under a DVG process.*

CONCLUSIONS

Assuming stock prices follow a Variance-Gamma process, we employ several methods in the gradient estimation techniques to estimate the Greeks of a European call option. The gradient estimators of gradients through three methods including the finite difference, the infinitesimal perturbation analysis (IPA) method and the likelihood ratio (LR) method are provided in Table 1 and Table 2. A numerical experiment is conducted. From the results in the table 3, we could draw the following conclusions. FD method is closest to the true value of gradients, but may get large standard error. Moreover, compare to IPA and LR methods, FD method is more time-consuming, since it requires running the simulation on one sample path twice. But estimators of IPA and LR of some gradients do not satisfy the condition of changing integral, i.e., the Lebesgue dominated theorem. Therefore, these two methods have some limitations in calculating some of the gradients. Furthermore, from the results in table 3, we could conclude that IPA method is more accurate than LR method.

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A TEST OF THE OHLSON MODEL ON THE ITALIAN STOCK EXCHANGE

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ABSTRACT

This article belongs to the current in research literature, which is concerned with value relevance. Its main aim is to test the impact of the current and future accounting variables on the firm's market value, by analyzing these relations with reference to the financial sector of the Italian Stock Exchange. To pursue this objective we carried out a multiple linear regression analysis, within a model inspired by the Ohlson model (1995). The model employed verified the research hypotheses for following (subsequent) stages by testing at first the impact of the current accounting variables, then of the future ones on the firm's market value. The results of the analysis show that the relation between the accounting variables (current and future) and the market price, after controlling for market risk, is fully proved on the Italian market, meaning that investors price accounting data in their firm's evaluation process. The article contributes to expand the number of empirical research studies on the value relevance of accounting variables, by analyzing this theme on a Stock Exchange market not yet explored from this perspective. The main originality of the article consists in its being one of the first research studies to test the validity of the Ohlson model (1995) in its original version on the Italian market.

JEL: G14, G21, G22, M41

KEYWORDS: Value relevance, Ohlson model, analysts' forecasts, financial sector.

INTRODUCTION

The present work belongs to the strand of literature known as *Value Relevance Analysis* (VRA), which, since 1995, has seen significant development and whose objective is that of estimating the relevance of an accounting value in the determination of market value. (Courteau, 2008). The theoretical basis on which the study is founded is represented by the Ohlson model (1995) - the main point of reference in market based accounting research (Giner and Iniguez, 2006 b) - the success of which amongst accounting scholars is due to its development of a rigorous theory for firm evaluation in terms of accounting. In this model, market evaluation is a function both of the fundamental accounting variables, and the "other information" variable (v), which contains all the information affecting future firm profitability and thus market forecasts. Although the model undergone to several empirical tests, particularly in the United States, much has yet to be learned on the market value/accounting values ratio in other geographical contexts, as well in as environments characterized by different forms of accounting regulation (Courteau, 2008). For the above reasons, we have chosen to test the validity of the model on a national market, which presents different characteristics both in terms of size (number of quoted firms), and orientation- towards the market or towards banks (Brealey *et al.*, 2007).

The present work has two aims: 1) To test the influence of the accounting variables *earnings* and *book value* on the firm's market value. 2) To test the influence of future profitability (approximated by financial analysts' forecasts on future earnings) on the market value of the firm. To verify the research hypotheses we conduct a regression analysis with a model inspired by the original version of the Ohlson model (1995). The research model tested the hypotheses in stages: first by testing the impact of the accounting variables on market value, and later the impact of financial analysts' forecasts on market value. The findings confirm the existence of a positive relationship between accounting values and market values.

The analysis focused on a particular area of the Italian capital market, the financial sector. The particular characteristics of this sector compared with others tend to induce market researchers to exclude it from their analysis. In the present study, by contrast, we focused our attention precisely on this sector in an attempt to establish whether the Ohlson model holds validity in this context. The year considered closed on 31/12/2009. The choice of limiting the data to the 2009 financial year is due to a desire to verify whether the relation between accounting and market values is still valid after the global financial crisis of 2008.The research favors an increase in knowledge from both the theoretical and the empirical points of view. As regards the theory, our research contributes to the spread of the value relevance model in the Italian context, which has not yet enjoyed particular attention from scholars. From the empirical point of view, the study contributes to the growing number of empirical studies in the field of value relevance. The originality of the present work consists in its being one of the first studies in Italy which aims at testing the validity of the Ohlson model (1995) in its original version.

The paper follows a positive methodological approach, which, as is widely known, extrapolates the research hypotheses from a fundamental theory. The remainder of the paper is as follows. Section 2 briefly discusses the relevant literature on the Ohlson model (1995). Section 3 describes research hypotheses and research methodology. Section 4 describes the best proxies for the risk, while Section 5 illustrates the empirical model used, while Section 6 illustrates data selection. Section 7 provides analysis and interpretations of the empirical findings and Section 8 concludes the paper.

LITERATURE REVIEW

The Ohlson model (1995) is the best known of the models of value relevance aimed at formalizing the relationship between accounting values and firm value. This model constitutes a solid theoretical framework for market evaluation based on fundamental accounting variables (capital and income), as well as on other kinds of information which may be relevant in predicting firm value. The Ohlson model (1995) focused on three main assumptions (Dechow *et al.*, 1999). The first considers firm value as the actualization of expected dividends (*Dividend Discounted Model* – DDM). The second assumption, known as *Clean Surplus Relation* (CSR), establishes that all modifications to the value of net firm assets classify as income or as dividends. The third assumption, known as *Linear Information Dynamics* (LID), shows that the residual earnings in time (X^a_{t+1}) depend in part on the residual earnings of the previous year (X^a_t), and partly on a series of other pieces of information (v_t), known to the market at time *t*, but not yet incorporated in the accounting system and, thus, excluded from the calculation of (X^a_t). This assumption confers originality on the model and leads to its formulation in the way considered in the present study. According to Ohlson, starting from DDM and combining the above-mentioned assumptions, the market value of firm is as follows:

$$MV_t = B_t + \alpha_1 X^a_t + \alpha_2 v_t \qquad (1)$$

Equation (1) shows how the value of a firm at any moment *t* is equal to the sum of three terms: its current net assets (B_t), which depend on the current residual earnings (X^a_t), and a term, which depends on the information available through extra-accounting sources at time *t,* (v_t).

In theoretical terms, the Ohlson model (1995) bases itself on a number simplifying assumptions. It assumes that investors are risk-neutral, that accounting is unbiased, that a clean surplus relation always holds, that no information asymmetries exist, that tax rates faced by shareholders are irrelevant, that market does not take explicitly into account real options and that abnormal earnings and '*v*' evolve in an autoregressive manner. To overcome limitations deriving from these simplifications, Ohlson himself, with other authors, intervened in the debate on the base model expressed by equation (1) (Ohlson 1995,

2001; Feltham and Ohlson 1995). Other authors focused on the question of firm-specific risk (Gebhardt *et al.*, 2001), information asymmetry (Hand and Landsman, 1999), taxes (Collins and Kemsley, 2000; Harris and Kemsley, 1999), real options (Yee, 2000) the time-series properties of abnormal earnings (Dechow *et al.,* 1999) and the linearity of function (Yee, 2000).

In the case in hand, we decided to use the base line version of the Ohlson model. We based our decision on a recent empirical study (Giner and Iniguez, 2006 b), which shows that models based on the original version are able to explain share prices with greater accuracy and fewer distortions of the real data than more complex models, such as, for example, that of Feltham-Ohlson (1995).

Research testing the OM (1995) and its subsequent versions have been widespread and most of the literature refers to the USA (Baumann, 1999; Myers 1999; Dechow *et al*., 1999; Callen and Morel 2001). Exceptions to this include the studies of McCrae and Nilsson (2001), Ota (2002) and Giner and Iniguez (2006 a) which consider the Swedish, Japanese and Spanish markets respectively. In order to use the Ohlson model (1995) of the equation (1) in their regression analyses, researchers modified it as follows:

$$MV_t = \beta_0 + \beta_1 B_{it} + \beta_2 X^a_{it} + \beta_3 v_{it} + \varepsilon_{it} \quad (2)$$

The role of the intercept and the residual term (ε) is to capture that part of share price variation, not explained by the variables on the right hand side of equation (2).
Lastly, as the regression models used in the study of value relevance often substitute residual earnings with net earnings, equation (2) can be re-written as follows:

$$P_t = \beta_0 + \beta_1 B_{it} + \beta_2 X_{it} + \beta_3 v_{it} + \varepsilon_{it} \quad (3)$$

The above equation is the one most widely used by scholars in empirical research (Aboody, 1996; Amir and Lev, 2001; Barth *et al.*, 1999). Focusing on the "other information" variable, we note how up until 1998, all empirical research based on the Ohlson model ignored the '*v*' variable because of the difficulties entailed in its identification (Hand, 2001; Hand and Landsman, 1998). Few researchers took this variable into consideration, each following an intuitive and individual course rather than seeking to derive it from a formal rational process (amongst others, Amir and Lev, 1996; Ittner and Larcher, 1998; Myers, 1999; Dechow *et al.*, 1999; Barth *et al.*, 1999). Ohlson himself intervened in the debate in 2001 (Ohlson, 2001), clarifying that ignoring the '*v*' variable reduces the model's empirical content and that, although the variable could be termed as a "mysterious" variable, it can be approximated with predictions of future earnings made by financial analysts. The authors of the present work, therefore, have chosen to apply the original version of the Ohlson model (1995) including the '*v*' variable as analysts' forecasts on earnings (Ohlson, 2001).

RESEARCH HYPOTHESES AND METHODOLOGY

In line with the theoretical framework of the Ohlson model described above and other studies which have empirically tested the value relevance of accounting variables (Gallizo and Salvador, 2006; Ragab and Omran, 2006; Mui-Siang Tan and Yeow Lim, 2007), the following research hypotheses were formulated:

H1: there is a positive relation between market value and book value

H2: there is a positive relation between market value and earnings

H3: there is a positive relation between market value and analysts' forecasts on future earnings
The methodology employed to verify the research hypotheses (H1-H3) was the econometric technique of

multiple linear regression with the least squares method (*Ordinary Least Squares - OLS*). Firstly, the regression function used to test the research hypothesis is as follows:

$$P_i = \beta_0 + \beta_1 BVPS_i + \beta_2 EPS_i + \beta_3 EPS_i^* + \varepsilon_i \quad (4)$$

It should be noted that the data used in the research is taken into consideration 'by shares' (i.e., divided by the number of shares in circulation), following a technique called scaling. Ohlson himself (2000) suggests this technique in order to avoid distortions in the calculation of coefficients of the line of regression, which may lead to misleading results (Courteau, 2008). According to the model expressed by equation (4), not only the Book Value Per Share (BVPS) and the Earning Per Share (EPS), but also the '*v*' variable contribute to the share price; the latter variable should express facts known to the market at time *t* and not (yet) incorporated into the accounting system, but nonetheless able to affect future earnings. The decision to render explicit the '*v*' variable with the financial analysts' forecasts (EPS^*) is justified by the consideration that such information of a perspective nature summarizes the most relevant part of all the information of a non-financial nature which can have an impact on a firm's future performance (Zhang, 2002; Byard and Cebenoyan, 2007).

In order to assess the impact of the financial analysts' forecasts on share prices correctly, it is necessary to neutralize the action of other factors which affect both the dependent variable (P) and the explanatory variables, referring both to actual balance sheets (BVPS and EPS) and future prospects (EPS^*). As is widely known, these are the factors, which, from a statistical point of view, known as control variables. In a model such as that of Ohlson, one cannot ignore the role played by market risk, given the fundamental relationship between risk and expected returns, and the implications of such a relationship both on market value (dependent variable) and on profitability (independent variable). Hence, in equation (4), we have inserted risk as a control variable:

$$P_i = \beta_0 + \beta_1 BVPS_i + \beta_2 EPS_i + \beta_3 EPS_i^* + \beta_4 risk_i + \varepsilon_i \quad (5)$$

The Definition of the Best Proxies of Risk

In order to define the best risk proxies, we needed to define a) the model to which to refer (mono-dimensional or multidimensional; b) the variables to choose as risk proxies. The main reference model that has theorized the risk-yield relationship is the Capital Asset Pricing Model (CAPM), elaborated independently by Sharpe (1964) and Lintner (1965), which establishes a connection between the performance of a share and its riskiness, measured by a sole risk factor, known as beta (β). In 1993, Fama and French, based on a series of empirical results, which highlighted the inadequacy of the CAPM, perfected a multidimensional model of risk (three-factor model) which takes into consideration, as well as the market *beta,* the other two variables, *size* and *book-to-market* in explaining share performance. The debate on the validity of the CAPM is not yet been solved; as well, the three-factor model is still the object of empirical testing, aimed at ascertaining whether results that hold for the American market are valid also in different contexts and periods. In this article, we have followed a multi-factor risk approach. In detail, starting from the Fama and French (1993) model and considering its application to the Italian context (Barontini, 1997; Beltratti and Di Tria, 2002; Bruni *et al.*, 2006; Brighi and D'Addona, 2008; Alesii, 2006; Aleati *et. al.*, 2000; Cavaliere and Costa, 1999), we choose the following risk proxies *beta, size* and *leverage*.

Our decision to choose to include *beta* as risk proxy is due to the key role played by beta in multidimensional models of risk assessment, even though results in the Italian sample provide mixed results with regard to its role in explaining share returns (Fama and French, 1993). The debate on the role of *size* as a risk factor (Banz, 1981) finds its most important motivation in the observation that small

firm's shares give greater returns than big firms do. One of the most persuasive explanations of the phenomenon, confirmed in different territorial contexts, is that the operators have information fluxes, which are less consistent and accurate when dealing with smaller firms. Financial markets translate this high level of uncertainty into a higher risk and, therefore, into higher demanded returns (Cavaliere and Costa, 1999). In the sample of studies under examination, the relation between size and yield holds. The Italian market thus seems to consider this factor in risk analysis, and hence we include 'size' amongst the explanatory risk variables. As regards the issue of size measurement, the chosen solution was that of expressing size through the most widely used indicator in econometric analysis, namely the number of employees to the firm's total sales (Juma and Payne, 2004) as suggested by the European Commission (European Commission 2003). Finally, a natural risk proxy is the firm *leverage*, for which Bhandari (1998) finds empirical evidence of its relation with firm revenue.

We have chosen to insert this variable in the present study for various reasons. Firstly, in the financial sector it is not possible to disregard such a risk indicator. Secondly, numerous studies on the Fama and French three-factor model have inserted leverage as an additional variable (Derwall and Verwijmen, 2006). Lastly, in agreement with Bandhari (1988) we believe that leverage is a catchall proxy, useful when a risk measure is unknown or difficult to measure. In the regression equation elaborated in the present study, the indicator used to measure leverage has been the total debts/total assets ratio. The reason for the exclusion of the third Fama & French's risk factors, the *book-to-market* ratio, is due to the circumstance that this ratio has had alternate success in empirical studies. It results highly relevant for US firms, whereas in Italy several studies have been unable to prove the existence of a link between this indicator and share revenue (Barontini, 1997; Aleati *et al.*, 2000; Bruni *et al.*, 2006). This circumstance and similar considerations demonstrated in numerous other studies (Reinganum, 1981; Banz, 1981; Banz and Breen, 1986) that size absorbs the value effect, has led us to use size as a proxy of the book-to-market effect.

Research Model

Two subsequent stages tested research hypotheses (H1-H3). Firstly, we verified the hypothesis relating to the existence of a positive relation between market value and book value (H1) and between market value and earnings (H2). We then verified research hypothesis H3 (the existence of a positive relation between market value and financial analysts' forecasts). The regression function used to test hypotheses H1 and H2 was determined starting from equation (5), in which we inserted the risk proxies as determined in the previous section:

$$P_i = \beta_0 + \beta_1 BVPS_i + \beta_2 EPS_i + \beta_3 beta_i + \beta_4 size_i + \beta_5 leverage_i + \varepsilon_i \quad (6)$$

P stands for the share price of the *i*-nth firm three months after the end of fiscal year. β_0 represents the intercept, BVPS is the book value per share, EPS is the earning per share. Beta is the systematic market risk index, size and leverage are firm-specific risk indicators and ε represents the error term, for which we consider a normal distribution, an average of zero and the absence of a correlation with the other variables in the model.Given that there is a problem of time lag between the explanatory variables and the dependent variable, as share prices take time to incorporate accounting information, we took them at the end of the first trimester of the period under consideration. On the other hand, we took accounting explanatory variables (BVPS and EPS) and the risk variables at the 31/12 of the period under consideration. The equation (6), determined adding the financial analysts' forecasts (EPS^*) to the explicative variables, shows the regression function used to test all the three hypotheses:

$$P_i = \beta_0 + \beta_1 BVPS_i + \beta_2 EPS_i + \beta_3 EPS_i^* + \beta_4 beta_i + \beta_5 size_i + \beta_6 leverage_i + \varepsilon_i \quad (7)$$

Sample Selection and Data Collection

The sample of firms selected to test the research hypothesis was made up of firms quoted on the Italian Stock Market which constitutes the so-called financial sector including banks, insurance companies (both life and non-life insurance) and firms from the "other financial services" sector. The Italian market was chosen for two reasons: 1) to obviate the current lack of empirical studies aimed at verifying the relations between market value and accounting values; 2) to test the validity of the Ohlson model on a market with significantly different characteristics compared to the Anglo Saxon one (Courteau, 2008; Brealey *et al.*, 2007). One significant preliminary difference of the Italian market is that it is bank-orientated, whereas the US market is decisively market-orientated, allowing firms to enjoy easier access to alternative sources of funding (Onado, 2008).

Further, the national regulation system has a legislative matrix, whereas in the Anglo-Saxon experts in the sector draw up markets accounting regulations. Moreover, whilst in the Italian market we see a substantial connection between ownership and control of firms, the Anglo-Saxon markets present a wider ownership of the equity capital (Courteau, 2008). Further peculiarities of the Italian market are identifiable in the high concentration of shareholders and the limited diffusion of a managerial culture amongst investors (Brealey *et al.*, 2007). The listed characteristics, together with the scarcity of empirical studies in the Italian context, have encouraged the authors to investigate the validity of the Ohlson model (1995) on the domestic market. In particular, we choose the financial sector to fill the void in empirical market research, which has hitherto excluded the financial sector from analysis.

The criteria followed for the sample selection were the following: we included the firms quoted in the year 2009; we took into consideration only firms not banned by regulators; we eliminated observations relating to quoted firms in which one or more of the key variables necessary to the calculation of the indicators were missing.

The Italian financial sector taken into consideration thus consisted of 53 firms, 20 of which belonging to the banking sector, 8 to the insurance sector and 25 to the financial services sector. Owing to the quantity of missing data, the final sample consisted of 30 firms, 15 of which belonging to the banking sector, 7 to the financial services sector and 8 to the insurance sector. Once defined the sample, we proceeded with the collection of the necessary secondary accounting data through the widely used *DataStream* database. The data thus collected, then re-elaborated in Excel spreadsheets, produced the input variables for the econometric model employed. To verify whether the investigated relation is still valid after the financial crisis of 2008, we decided to refer our analysis only to 2009. Table 1 reports the summary statistics of the variables employed in the estimation.

Table 1: – Summary Statistics

Variable	Observations	Mean	Std dev	Min	Max
March closing price	30	5.44	5.17	0.28	23.36
BVPS	30	6.32	6.20	0.40	24.28
EPS	30	0.19	0.22	0	0.81
EPS*	30	0.42	0.42	-0.02	1.7
Beta	30	1.01	0.36	0.36	1.84
Leverage	30	26.86	18.56	0	68.78
Size	30	0.01	0.03	0.0002	0.15

P-values showed in the table refer to the t-test, which is the coefficient divided by the standard errors. Standard errors were corrected for the White test, which keeps heteroskedasticity problems in check; further, multicollinearity of the dependent variables, which could have an impact on the significance test, was tested through a correlation analysis, not included here, which revealed no problems of collinearity.
The first three columns in table 2 report the results of the OLS regressions where the March closing price

is regressed independently on BVPS, EPS, EPS*. The second three columns show the March closing price regressed independently on explicative variables after controlling for the three risk proxies (beta, size, leverage). The inclusion of the control variables in all cases improves the fit of the model to the collected data.Finally, the last two columns show the results of the regression equation (6) and (7).

REGRESSION RESULTS

Table 2 shows the results of the regression analysis that tested the research hypotheses H1-H3.

Table 2: Results of the Regression Equation (7)

Variables	Predicted Sign	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Book value per share (BVPS)	+	0.61***			0.63***			0.58***	0.11**
Earnings per share (EPS)	+		11.47***			10.50**		7.58***	2.44**
Forecast Earnings per share (EPS*)	+			11.91***			11.77***		10.05***
Beta	-				-0.64	1.76	-0.26	-0.12	-0.25
Size	+				10.14	-18.87	5.50	12.75	9.06
Leverage	-				-0.09**	-0.05	-0.02	-0.07**	-0.03**
Cons	?	1.55	3.22***	0.39	4.37**	3.06	1.25	2.19	0.90
R^2		54.4%	23.42%	94.48%	63.33%	29.37%	95.03%	72.60%	96.34%
F test		33.40***	8.56***	479.05***	10.79***	2.60**	119.38***	12.72***	100.79***

****, **, * show 1%, 5% and 10% level significance respectively.*

Model 7 tested whether investors include accounting information on the value of net equity (H1) and profitability (H2) in their firm evaluation. The variables of interest are thus the values assumed by parameter β_1 and β_2 of the regression equation (6), which should be positive and statistically significant if the research hypothesis is valid. From the analysis of Model 7, it emerges that both hypotheses H1 and H2 appear to be demonstrated, as the book value per share (BVPS) and earnings per share (EPS) coefficients are significant *(p-value <0,001)* and they vary in the predicted direction (positive relation between assets value and firm profitability, on the one hand, and market value on the other). Of the two coefficients, the EPS seems to be the more significant. Lastly, the signs of the control variables vary in predicted direction. The model appears apt for describing the relation between market value and the explanatory variables (R^2= 72.60%) and the diagnostic statistical F, which measures the overall significance of the coefficients together, is significant.

The last column shows the results of the regression analysis, which tested research hypothesis H3. Once again, the research hypothesis to test is whether investors in their firm evaluation process, include information on future profitability. Generally, researchers use the predictions of market experts to proxy the future earnings. In our research, we use the analysts' forecasts on earnings. This information is publicly available, in accordance with the regulations of CONSOB (Italian National Commission for the monitoring of companies listed on the Stock Exchange) and the Italian Stock Exchange.

As regards the regression equation (7), the variable of interest is the value assumed by parameter β_3. We expected this coefficient to be positive and statistically significant. As we can see from the last column, the resulting data for the fundamental accounting variables (BVPS and EPS) appear robust to the inclusion of the EPS* variable. The value of the EPS* coefficient, which measures the future EPS predictions by financial analysts at the end of the considered period (31/12/2009), is highly significant and its value shows a direct and extremely close relation to market price. The control variables move in the predicted direction but only the leverage variable is also statistically significant. The inclusion in the model of the financial analysts' forecasts improves both the fit of the model to the collected data

(R^2=96.34%) and the conjoint significance of the coefficients, tested by the diagnostic F.

Concluding Considerations and Suggestions for Future Research

The present work had two aims. Firstly, it tests the influence of accounting variables earnings and book value on the firm's market value; secondly, it tests the influence of future profitability (approximated by the financial analysts' forecasts on future earnings) on the market value of the firm. The methodology used is a regression analysis using a pooled OLS model based on the Ohlson model (1995). The analysis focused on a particular area of the Italian capital market, the financial sector, which comprehends banks, insurance companies and other financial sector companies. The year considered closed on 31/12/2009.

The research model tested the hypotheses in two stages: first by testing the impact of the accounting variables on market value, and second the impact of financial analysts' forecasts on market value. The results of the first stage analysis show that the relation between the accounting variables (current and forward) and the market price, after controlling for market risk, is fully proved on the Italian market, meaning that investors price accounting data in their firm's evaluation process. Such results are in line with those from other international studies, in which R^2 is between 70% and 90% (Courteau, 2008). In the second stage of analysis, we included the financial analysts' forecasts on future earnings as an explicative variable of the model. The choice to use the complete Ohlson (1995) model, inclusive of the 'v' variable is justified by the consideration that investors, in evaluating firms, do not consider only current accounting information, but also information on the future firm's profitability.

Therefore, to ignore the impact of these last on the firm's market evaluation could have two negative consequences. Firstly, the limitation of the explicative power of the model, which could be deprived of an explicative variable of considerable importance above all in contexts characterized by environmental uncertainty and turbulence such as that pertaining at present. Another problem could be the statistical bias caused by the omission of an explicative variable of the model. The findings of the second stage analysis confirm the research hypotheses, since the R^2 of the model inclusive of the financial analysts' forecasts on the firm's profitability (H3 hypothesis) is bigger than the R^2 of the model, which includes only the current accounting variables. Moreover, the statistical diagnostic F, testing the conjoint significance of the explicative variables' coefficients is higher for the model inclusive of the H3 hypothesis. Moreover, these results could be a proof that the relation between accounting and market value is still valid after the financial crisis of 2008.

The main limitations of the paper reside in the limited range of the data examined (referring only to the financial sectors) and in the brief time span considered (2009). For this reason, it is necessary to exercise a degree of caution in drawing conclusions from the findings. Potential improvements to the present study may see its extension to further sectors of the Italian Stock Market, as well as extending the periods and employing sophisticated econometric models. Moreover, the variable relating to market expectations of future firm performance approximated in this work by the forecasts of financial analysts, could be refined to consider not just predictions on future performance, but also those on further relevant accounting variables such as those linked to book value.

Finally, the present work may benefit from an in-depth examination of the issues linked to the choice of variables dealing with risk, i.e., integrating and placing them together with the macroeconomic variables (interest rate performance, economic performance, etc.) and/or considering further variables, successfully tested in other empirical studies using the Ohlson model. As regards future research implications, the results constitute a preliminary verification, on the Italian market, of the validity of the Ohlson model in its original formulation. Moreover, an increased understanding of the determinants, which orientate investment choices, could influence the managerial choices regarding the application of opportune accounting evaluation criteria. In addition, knowledge of the criteria adopted by financial analysts in

forecasting a firm's future profitability becomes crucial for management in identifying the elements to monitor in terms of their influence on future company performance.

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ACKNOWLEDGMENTS

Sections 3, 5, 6, 8 credited to Antonella Silvestri, Sections 1, 2, 4, 7 credited to Stefania Veltri.

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THE RELATIONSHIP BETWEEN ACCRUALS, EARNINGS, AND CASH FLOWS: EVIDENCE FROM LATIN AMERICA

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ABSTRACT

The relationships between earnings, accruals, and cash flows for selected Latin American countries (Mexico, Chile, and Argentina) are investigated in this study from 1990 to 2009. We find a negative relationship between accruals and cash flow across decile portfolios. More importantly, firms reporting the highest level of accruals, have the worst level of cash flows, but not the worst level of earnings. This relationship is of economic importance given that investors are very oriented towards firms yielding high earnings and might fail to realize that earnings are not always accompanied by strong levels of cash flows. Results are disaggregated by years and countries, and compared to previous results for U.S. firms.

JEL: G3, M4.

KEYWORDS: Finance; Earnings and Cash; Financial Accounting; Latin American Public Firms.

INTRODUCTION

The importance of the relationships among earnings, accruals, and cash flows was illustrated in a *Wall Street Journal* article by Laucirella (2008). In the WSJ article Matthew Rothman of Lehman Brothers talks about the company's investment strategy of screening stocks based on changes in accruals. In the same article Richard Sloan, of Barclays Global Investors, notes that investors should "expect to see more strains on companies with rising accrual." Sloan (1996) documented the so called accrual anomaly, another deviation from the market efficiency theory widely accepted in the academic literature. In this study we partially replicate Sloan's to shed light on the relationships among accruals, cash flows, and earnings for Latin America firms. International studies on accruals have not studied this sample yet.

The paper is organized as follows: In the next section we provide a review of relevant literature. A description of the sample and methods follows. We then present the empirical results and finally provide concluding remarks.

LITERATURE REVIEW

In a seminal paper related to accruals and stock returns Sloan (1996) analyzes the U.S. market from 1962 to 1991, and documents a systematic relationship between current period's accruals and future period's stock returns. He further argues that few investors pay attention to this relationship, opening the possibility for arbitrage. In particular, he shows that by following an accruals trading rule, a 10.4% above expectation (abnormal) returns could have been obtained in that period of study. This possibility of arbitrage is termed the accrual anomaly in the financial and accounting economics literature. Several studies have replicated, extended, and challenged the accrual anomaly (Richardson, Sloan, Soliman and Tuna (2005), Chan, Chan, Jegadeesh and Lakonishok (2006), Kraft, Leone and Wasley (2006), Kothari, Loutskina and Nikolaev (2006); and most recently Shon and Zhou (2010) and Hafzalla, Lundholm and

Van Winkle (2011), to cite a few of them). Khan (2008) provides a survey of the streams of research on this anomaly. While it has been shown by Ali, Chen, Yao and Yu (2008) that actively managed equity mutual funds on average do not trade on this anomaly, a complete explanation of this problem has yet to be provided. Khan (2008), (pp72), illustrates the importance of this research problem:

> *"[The accrual anomaly] is especially troubling because it implies that the market misunderstands a reported financial accounting number… It is hard to imagine how a number that is misunderstood could be very useful*"

We are interested in the stream of research that examines the accrual anomaly in countries other than in the U.S. LaFond (2005); Pincus, Rajgopal and Venkatachalam (2007); and Kaserer and Klingler (2008) have investigated the accrual anomaly in an international context but none of these studies have investigated the accrual anomaly in Latin American countries.

LaFond (2005) was the first to provide evidence that the accrual anomaly is present in non-U.S. markets. He also finds that the accrual anomaly is not related to differences in legal systems nor it is associated with the level of investor protection and it is present in countries with both high and low accrual intensive accounting systems. In contrast, Pincus, Rajgopal and Venkatachalam (2007) find that firms overweight more accruals in countries with a common law tradition relative to a code law tradition, where extensive use of accrual accounting is allowed, in the presence of weaker outside shareholder rights, and in countries where there is a low ownership concentration. Kaserer and Klingler (2008) focus their study on accounting standards and find that the overreaction to accrual based information is most likely related to firms complying with international accounting standards (that tend to be US-GAAP based) than for firms that follow a more conservative system like Germany-GAAP. Overall, the international evidence gives us with the opportunity to shed some light on results of accruals for Latin American firms.

The sample in LaFond (2005) includes Australia, Belgium, Canada, Denmark, France, Germany, Hong Kong, Italy, Japan, the Netherlands, Norway, Singapore, Spain, Sweden, Switzerland, and the U.S. Pincus, Rajgopal and Venkatachalam (2007) test the anomaly in the same countries as in LaFond (with the exception of Belgium and Norway) and add to their sample India, Indonesia, Malaysia, Taiwan, Thailand, and the U.K.; Kaserer and Klingler (2008) test the anomaly for Germany firms focusing their study on accounting standards. None of these studies have studied the accruals problem for Latin American countries. Although the study does not attempt to test the accrual anomaly, we investigate the relationships among accruals, cash flows, and earnings for Latin America firms, partially replicating the work by Sloan (1996). These relationships form the basis of the accrual anomaly problem.

DATA AND METHODOLOGY

Data from Economatica, the largest subscription-based financial database for Latin American publicly traded firms, are used in this study. Economatica also includes information from a few firms that are privately held but that report their financial statements to a local regulatory agency. Private firms were excluded from the sample. Financial firms were also excluded since their financial statements differ from those of all other industries.Economatica includes firms from Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela in a standardized format, which allows comparison across firms, countries, and industries. Trailing twelve months (ttm) financial statements data in U.S. dollars as of the end of each quarter were used.All empirical variables as defined in equations (1) and (2) in the following section were calculated in the study. All variables were considered critical in the sense that firm-trailing twelve month (firm-ttm) observations with missing values on any of the variables defined in this study were eliminated from the sample. In addition, as the estimation of most variables required the estimation of changes from period *t-1* to period *t*, when data on the appropriate sequence was not available to estimate such change, the firm-ttm observation was eliminated from the sample.

After filtering the data following the criteria outlined above, firms from Venezuela, Peru, and Colombia were eliminated. The firm-ttm observations for those countries were far lower than the number of observations for the rest of the countries. Thus, the final sample includes firms from Mexico, Argentina, and Chile from 1990 to the third quarter of 2009. The final sample includes 14,039 firm-ttm observations as shown in the first row of Table 1.

Empirical Measures of Accruals and Earnings

Earnings (*Ear*) represent the sum of a cash flow (*CF*) and an accrual (*Acc*) component. Cash flow is measured as,

$$CF = Ear - Acc, \quad (1)$$

where the variable earnings, *Ear,* is operating income. Some studies measure earnings differently. For example, Freeman, Ohlson and Penman (1982), use net income, while Dechow (1994); and Moehrle, Reynolds-Moehrle and Wallace (2003) use net income excluding extraordinary items and discontinued operations. We follow the literature related to accruals and use operating income. Operating income excludes non-recurring items such as extraordinary items, discontinued operations, special items and non-operating income, taxes, and interest expenses.

Accruals, *Acc,* is measured following Chan, Chan, Jegadeesh and Lakonishok (2006) as,

$$Acc = \Delta AR + \Delta INV + \Delta OCA - \Delta AP - \Delta OCL - DA, \quad (2)$$

where *AR* is accounts receivable, *INV* is inventories, *OCA* is other current assets, *AP* is accounts payable, *OCL* is other current liabilities; and DA is depreciation and amortization.

All variables are divided by total assets to control for scale differences. Alternative investment bases have been used in the literature including sales, beginning of period assets, ending of period assets, book value of net assets generating the accruals, and market capitalization. Accruals results have been reported to be insensitive to the choice of investment base.

Two issues related to the measurement of accruals must be mentioned. As defined in this study, variable accruals relates to *operating* cash flow as opposed to free cash flow to equity. This follows the implementation of accruals introduced by Healy (1985) and Sloan (1996) and used in most recent studies. Richardson, Sloan, Soliman and Tuna (2005) measure total accruals (related to free cash flow to equity), but their suggestion has not been repeated in the literature. Secondly, accruals are measured indirectly from the balance sheet instead of taking it directly from the statement of cash flow. This is common in research on the accrual anomaly with the notable exception of Kraft, Leone and Wasley (2006).

RESULTS

Table 1 presents the means of selected financial characteristics by country and for Latin America as a group. Table 2 provides information on earnings and components for Latin America countries and as a group, and for the U.S. from a previous study. Panel A provides earnings, accruals and cash flow. On average, Latin American firms yield very low earnings compared to the U.S. (6% compared to 12.1%). The difference on reported earnings is consistent on both the accrual and cash flow component of earnings (i.e., accruals for Latin America are lower than the U.S., and cash flow for Latin America are lower than the U.S. as well).

Table 1: Descriptive Statistics for Selected Latin American Countries, 1990-2009

	ARGENTINA	CHILE	MEXICO	LATIN AMERICA
Observations	1,423	4,813	7,803	14,039
Assets	365,892	334,798	1,901,297	1,208,624
Accounts receivable	26,938	35,435	159,139	103,330
Inventories	21,417	30,706	146,325	94,027
Accounts payable	24,658	24,774	109,934	72,095
Leverage	0.3386	0.2272	0.3090	0.3016
EBIT	26,745	22,457	318,464	187,415

Table 1 *provides means of selected financial items. The sample, described in section "Data," covers the 1990-2009 period, and 14,039 observations. Leverage is total debt with cost divided by the sum of total debt with cost and the book value of equity, EBIT is earnings before interest and taxes. With the exception of leverage and number of observations, values are expressed in thousands of US dollars (Converted by Economatica using exchange rates as given as of the end of each month).*

Table 2: Earnings and Components for Selected Latin American Countries for the 1990-2009 Period and for the USA

Ítem		ARGENTINA	CHILE	MEXICO	LATIN AM	USA
Panel A - Earnings and Components						
	Accruals					
Mean		(0.0490)	(0.0332)	(0.0253)	(0.0304)	(0.0120)
σ		0.0651	0.2125	1.1497	0.8664	0.1020
	Cash Flow					
Mean		0.1063	0.0773	0.0957	0.0905	0.1330
σ		0.1053	0.2582	1.1911	0.9014	0.1410
	Earnings					
Mean		0.0573	0.0441	0.0704	0.0601	0.1210
σ		0.0880	0.1475	0.1059	0.1209	0.1260
Panel B - Accruals Components						
	ΔAR					
Mean		(0.0021)	(0.0017)	0.0006	(0.0004)	0.0300
σ		0.0517	0.1617	0.0416	0.1010	0.0730
	ΔINV					
Mean		(0.0010)	(0.0010)	0.0008	(0.0000)	0.0260
σ		0.0404	0.1007	0.0422	0.0681	0.0710
	ΔOCA					
Mean		(0.0005)	(0.0006)	(0.0002)	(0.0003)	0.0040
σ		0.0168	0.0333	0.0409	0.0366	0.0230
	ΔAP					
Mean		(0.0018)	(0.0007)	0.0010	0.0001	0.0140
σ		0.0414	0.1121	0.0376	0.0726	0.0450
	ΔOCL					
Mean		(0.0002)	(0.0015)	(0.0105)	(0.0064)	0.0130
σ		0.0291	0.1044	1.1466	0.8571	0.0380
	DA					
Mean		0.0474	0.0322	0.0361	0.0359	0.0450
σ		0.0297	0.0992	0.0463	0.0683	0.0280

The Latin America sample, described in the "Data" section, covers the 1990-2009 period for a total of 14,039 observations. USA results are from a previous study by Chan, Chan, Jegadeesh and Lakonishok (2006) for the 1971-1995 period. Earnings is estimated as operating income, Accruals as defined in equation (2), and Cash Flow is a proxy for cash flow from operations as defined in equation (1). ΔAR is change in account receivables, ΔINV is change in inventories, ΔOCA is change in other current assets, ΔAP is change in accounts payable, ΔOCL is change in other current liabilities, and DA is depreciation and amortization. All variables are divided by total assets to control for scale differences. σ is standard deviation.

For Latin American countries, Mexico reports the highest and most stable level of earnings (i.e., stability measured by the coefficient of variation). The average reported earnings (7%) for Mexico is statistically different to average earnings for Argentina and Chile at the 1% significance level (i.e., T-statistics of -4.995 and -10.810 respectively, untabulated). Mexico, however does not report the highest cash flow. The 9.6% level of cash flow reported for Mexico is not statistically different to cash flows of Chile and Argentina. In general, as expected given the level of sophistication of these capital markets, results for Latin America as a group, presented in panel A of Table 2, are less stable than the U.S. market.

Presented in Panel B of Table 2 are accruals decomposed according to equation (2). Depreciation and amortization (*DA*) is the largest component of accruals across all countries, but it is the most stable component as well. This could be explained by the nature of this item related to *permanent* assets. Excluding depreciation and amortization, net operating working capital relative to total assets, defined as $\Delta AR+\Delta INV-\Delta AP$, is the main component of accruals. Net operating working capital for Latin America as a group is 0% relative to total assets, compared to 4.3% for the U.S. This difference could be of important since it represents, for Latin American firms, cash that does not need to be tied to operations compared to the average U.S. firm. This amount for the U.S. represents almost one third of average reported earnings. Results for Latin America are consistent across countries.

Accruals Portfolios

To better understand the relationships among accruals, cash flow, and earnings across firms and countries, results are analyzed by portfolios of accruals as it has become standard in this line of research. Every year, all firms in the sample are ranked according to the magnitude of accruals and assigned to one of ten decile portfolios. Provided in Table 3 are the means of earnings, accruals, and cash flow along with a proxy for size by accrual portfolio for Latin America.

Table 3: Accruals, Earnings, Cash Flow, and Sales for Latin American Firms by Decile Accrual Portfolios, 1990-2009

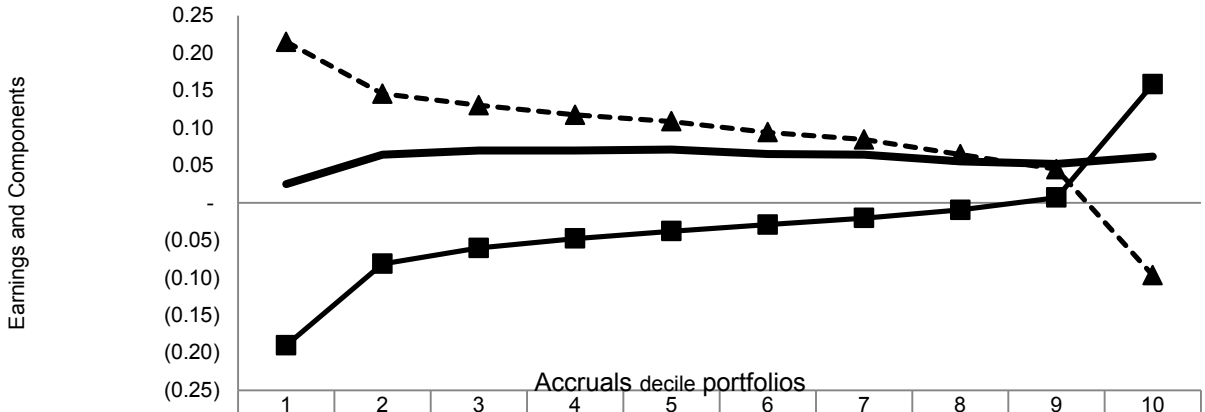
Decile Portfolio	Accruals	Earnings	Cash Flow	Sales
Portfolio 1	(0.1900)	0.0251	0.2151	8.013
Portfolio 2	(0.0814)	0.0644	0.1458	8.098
Portfolio 3	(0.0602)	0.0702	0.1304	8.065
Portfolio 4	(0.0476)	0.0700	0.1176	8.079
Portfolio 5	(0.0376)	0.0712	0.1088	8.064
Portfolio 6	(0.0291)	0.0653	0.0944	8.056
Portfolio 7	(0.0202)	0.0645	0.0847	8.055
Portfolio 8	(0.0093)	0.0555	0.0649	8.044
Portfolio 9	0.0071	0.0520	0.0448	7.870
Portfolio 10	0.1585	0.0619	(0.0967)	7.990

Provided in Table 3 are the means of earnings, accruals, and cash flow (as defined in equations 1 and 2) along with a proxy for size (i.e., the natural logarithm of total assets) for Latin American publicly traded firms. The Latin America sample (Argentina, Chile, and Mexico), described in the "Data" section, covers the 1990-2009 period for a total of 14,039 observations. Every year, all firms in the sample are ranked according to the magnitude of accruals and assigned to one of ten decile portfolios. Decile portfolio one (portfolio 1) contains firms with the lowest level of accruals, portfolio 2 contains firms with the second lowest level of accruals, up to portfolio 10, which contains firms with the highest level of accruals.

Decile portfolio one (portfolio 1) contains firms with the lowest level of accruals, portfolio 2 contains firms with the second lowest level of accruals, up to portfolio 10, which contains firms with the highest level of accruals. There is a negative relationship between accruals and cash flow across decile portfolios. As one moves from portfolio 1 with a mean of -0.1900 for accruals to portfolio ten with a mean of 0.1585, cash flow monotonically decreases from 0.2151 to -0.0967. With regards to earnings and accruals, although the relationship across portfolios tends to be positive (i.e., forcing the negative

relationship between accruals and cash flow), this is not always the case. The properties of earnings and its components was first shown in decile portfolios by Dechow (1994) and Sloan (1996) for the U.S. market. This has been replicated by Chan, Chan, Jegadeesh and Lakonishok (2006); Kothari, Loutskina and Nikolaev (2006); and Trejo-Pech, Weldon and House (2008) among others using different time periods or subsets (e.g., specific industries). Figure 1 illustrates these relationships. Table 3 also provides *sales*, defined as the natural logarithm of sales, as a control variable to proxy size. Consistent with previous studies cited before, sales across portfolios follow an inverted U shape. Decile portfolios in the extremes (portfolios 1, 9, and 10) contain the smallest firms across portfolios.

Figure 1: Earnings, Accruals, and Cash Flows for Latin American Countries by Accruals Portfolios: 1990-2009. Variable Accruals Was Forced to Change Monotonically Across Portfolio



	1	2	3	4	5	6	7	8	9	10
Accrual	(0.19)	(0.08)	(0.06)	(0.05)	(0.04)	(0.03)	(0.02)	(0.01)	0.01	0.16
Earnings	0.03	0.06	0.07	0.07	0.07	0.07	0.06	0.06	0.05	0.06
Cash Flow	0.22	0.15	0.13	0.12	0.11	0.09	0.08	0.06	0.04	(0.10)

Plotted with data from Table 3

Table 4 provides T-Statistics of mean equality tests across Table 3. Panel A of Table 4 shows results for cash flow across portfolios. The first row of the panel shows that the average cash flow of portfolio 1 is statistically different to the means of the other 9 portfolios. Similarly, the last column shows that the mean value of cash of portfolio 10 is statistically different to the rest of portfolios. There is also a tendency for portfolio 9 (column P9) to be different from the other portfolios. But the cash flow means of portfolios other than 1 and 10 do not differ statistically among themselves.

T-statistics in the diagonal of panel A show that the average cash flow of portfolio 1 is statically different to portfolio's 2 at the 5% level of significance, but the average cash flow of portfolio 2 is not statistically different to portfolio's 3, the average cash flow of portfolio 3 is not statistically different to portfolio's 4, and so on up to portfolios 8 and 9, which have different cash flow means. In summary, only decile portfolios 1, 9, and 10 are statistically different from the rest of portfolios in terms of cash flow averages, with high accrual portfolios 9 and 10 reporting the most deteriorated level of cash flows and low accrual portfolio 1 reporting the highest cash flow level. Results for the level of accruals across portfolios (Panel B of Table 4) follow a similar pattern. However, results for earnings are slightly different.

Panel C of Table 4 shows that average of earnings for portfolios 8, 9, and 10 are statistically different from the rest of portfolios (i.e., this does not happen with the other extreme, portfolios 2, and 3). Further, while portfolios 8, 9, and 10 have the highest level of accruals (i.e., it was forced to be that way because of the sorting process), those portfolios do not have the highest level of earnings (portfolio 8, 9, and 10 have earnings of 5.5%, 5.2%, and 6.2% and portfolios 3, 4, and 5 have 7.0%, 7.0%, and 7.1% respectively). This result differs from what have been reported before in empirical studies for US firms.

Thus, sorting firms by level of accruals provides new insights not shown when earnings are analyzed. Of economic importance is the fact that Latin American firms reporting the lowest level of earnings (0.0251) report the highest level of cash flow. More importantly, firms reporting the highest level of accruals, *but* not the highest level of earnings, have the worst cash flow (negative 0.0967, Table 3).

Table 4: T-Statistics of Mean Equality Tests Across Portfolios According to Level of Cash Flow, Accruals, and Earnings for Latin American Firms

CASH									
	P2	**P3**	**P4**	**P5**	**P6**	**P7**	**P8**	**P9**	**P10**
P1	-2.036**	-2.487**	-2.861***	-3.125***	-3.540***	-3.827***	-4.415***	-4.997***	-9.195***
P2		-0.454	-0.828	-1.091	-1.513	-1.801*	-2.387**	-2.975***	-7.182***
P3			-0.374	-0.637	-1.059	-1.347	-1.932*	-2.520**	-6.722***
P4				-0.262	-0.686	-0.974	-1.558	-2.147**	-6.349***
P5					-0.425	-0.712	-1.297	-1.887*	-6.091***
P6						-0.286	-0.869	-1.458	-5.649***
P7							-0.582	-1.172	-5.364***
P8								-0.592	-4.789***
P9									-4.187***
ACCRUALS									
	P2	**P3**	**P4**	**P5**	**P6**	**P7**	**P8**	**P9**	**P10**
P1	3.324***	3.968***	4.357***	4.665***	4.915***	5.189***	5.530***	6.025***	10.704***
P2		0.649	1.037	1.344	1.604	1.877*	2.214**	2.716***	7.399***
P3			0.388	0.694	0.955	1.228	1.564	2.066**	6.743***
P4				0.306	0.568	0.841	1.175	1.679*	6.356***
P5					0.263	0.536	0.871	1.375	6.054***
P6						0.272	0.605	1.109	5.775***
P7							0.333	0.837	5.504***
P8								0.506	5.179***
P9									4.664***
EARNINGS									
	P2	**P3**	**P4**	**P5**	**P6**	**P7**	**P8**	**P9**	**P10**
P1	8.632***	9.889***	9.883***	10.125***	8.819***	8.637***	6.695***	5.897***	8.101***
P2		1.266	1.258	1.492	0.203	0.015	-1.950*	-2.738***	-0.568
P3			-0.009	0.225	-1.061	-1.249	-3.216***	-4.001***	-1.840*
P4				0.234	-1.053	-1.241	-3.208***	-3.994***	-1.831*
P5					-1.287	-1.476	-3.445***	-4.231***	-2.067**
P6						-0.187	-2.149**	-2.936***	-0.771
P7							-1.963**	-2.749***	-0.583
P8								-0.791	1.389
P9									2.181**

T-Statistics of mean equality tests across portfolios according to level of cash flow, accruals, and earnings (as defined in equations 1 and 2. Series aggregated in Table 3). The sample (Argentina, Chile, and Mexico), described in the "Data" section, covers the 1990-2009 period for a total of 14,039 number of observations. To implement the mean equality tests we run the following regression model: $\boldsymbol{C} = \boldsymbol{D\beta}+\boldsymbol{U}$ *(3), where* ***C*** *is a vector of 14,039 components (e.g., cash flows for results in Panel A, accruals for Panel B, and earnings for Panel C),* ***D*** *is a 14,039 x 11 matrix with the first column of 1's and columns 2 to 11 with dummy variables D1 to D10 (D1 is set to 1 if the observation belongs to accruals decile portfolio 1 and to zero otherwise, D2 is 1 if observation is in accruals decile portfolio 2, up to D10). The intercept is the mean of the variable set up as reference (to avoid the dummy variable trap) and the parameter estimates represent the deviations from the intercept. The T- Statistics of estimates show if the parameter is different to the intercept (for instance, -2.036 in the upper left part of the table means that the average cash flow for portfolios 1 and 2 are statistically different at the 5% level of significance).* ***B*** *is a matrix of estimated parameters, and* ***U*** *is a vector with errors. P1 corresponds to accruals decile portfolio 1, P2 to portfolio 2, and so on. ***,**, and * indicate 1%, 5%, and 10% statistical significance.*

Table 5 shows that in general results are consistent when the data is disaggregated by country. Again, except for minor differences, results for Latin American firms are similar to those reported by previous studies for the U.S. market. These simple properties of earnings and its components form the basis for the hypothesis formulated by Sloan (1996) that earnings attributable to the accrual component of earnings are less persistent into the future than earnings attributable to the cash flow performance of earnings. With further development, this generates the so called fixation hypothesis by Sloan (1996), which states that investors are earnings-oriented and do not recognize the information on accruals when implementing their trading strategies. The fixation hypothesis then predicts that realized returns are systematically different from expected returns (i.e. expectations fixated on earnings), and that opens the possibility for arbitrage.

Table 5: Accruals, Earnings, Cash Flow, and Sales for Latin American Firms by Country, 1990-2009

	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
					Mexico					
Accruals	(0.1931)	(0.0837)	(0.0615)	(0.0485)	(0.0385)	(0.0300)	(0.0211)	(0.0095)	0.0093	0.2193
Earnings	0.0269	0.0726	0.0806	0.0791	0.0815	0.0773	0.0748	0.0705	0.0646	0.0759
Cash Flows	0.2200	0.1562	0.1421	0.1276	0.1200	0.1073	0.0959	0.0800	0.0553	(0.1435)
Sales	12.077	12.735	12.910	12.956	12.990	12.601	12.569	12.226	11.953	12.015
					Chile					
Accruals	(0.1935)	(0.0746)	(0.0542)	(0.0419)	(0.0321)	(0.0236)	(0.0146)	(0.0052)	0.0077	0.0956
Earnings	0.0122	0.0576	0.0597	0.0603	0.0572	0.0483	0.0494	0.0272	0.0305	0.0379
Cash Flows	0.2057	0.1321	0.1139	0.1022	0.0893	0.0718	0.0640	0.0324	0.0228	(0.0577)
Sales	10.092	11.037	11.026	10.923	11.043	10.464	9.997	9.681	10.086	10.484
					Argentina					
Accruals	(0.1602)	(0.0916)	(0.0735)	(0.0613)	(0.0516)	(0.0426)	(0.0340)	(0.0224)	(0.0070)	0.0448
Earnings	0.0595	0.0426	0.0483	0.0546	0.0612	0.0571	0.0589	0.0690	0.0550	0.0666
Cash Flows	0.2197	0.1342	0.1218	0.1159	0.1128	0.0997	0.0929	0.0914	0.0620	0.0218
Sales	11.153	11.425	11.306	11.522	11.645	11.519	11.566	11.404	11.065	10.664

Table 5 provides the means of earnings, accruals, and cash flow (as defined in equations 1 and 2) along with a proxy for size (i.e., the natural logarithm of total assets) for Mexico, Chile, and Argentina. The sample, described in the "Data" section, covers the 1990-2009 period for a total of 14,039 number of observations. Every year, all firms in the sample are ranked according to the magnitude of accruals and assigned to one of ten decile portfolios. Decile portfolio one (P1) contains firms with the lowest level of accruals, P2 contains firms with the second lowest level of accruals, up toP10, which contains firms with the highest level of accruals.

Firms with Extreme Magnitude of Accruals

The accrual anomaly problem referred to above has centered its attention on firms with extreme levels of accruals (i.e., decile portfolios 1 and 10 or quintile portfolios 1 and 5), which behave differently from the rest of firms. Based on this result, the study groups results by quintiles portfolios (we classified firms by quintiles guided by the results discussed above, mainly that smallest firms are concentrated in portfolios 1, 9 and 10 –Table 3-, and that portfolios 1,2,9, and 10 are in general statistically different to the rest of portfolios –Table 4). Table 6 provides results for quintile 1 (low-accruals portfolio), quintile 5 (high-accruals portfolio), and the average of quintiles 2, 3, and 4 (mid-accruals portfolio). To investigate if these results have changed over the period analyzed, results by year are provided as well.

Results presented in Table 6 show that consistently high-accruals portfolios report relative high levels of earnings but very low levels of cash flow, negative in the case of Mexico and Chile. Further, the gap between earnings and cash flow is higher after 2000. Results in Table 6 also show that in 15 out of the 19 years analyzed, the smallest firms are in the high-accruals portfolios. The relationships evidenced in this study for Latin American firms are important given that investors are very oriented towards firms yielding high earnings and might fail to realize that earnings are not always accompanied by a strong level of cash. Further, the relationship between accruals and earnings is not always positive.

Table 6: – Accruals, Earnings, Cash Flow, and Sales for Latin American Firms by Year for Low-Accrual, High-Accrual, and Mid-Accrual Portfolios

Panel A Low Accruals				
Year	**Accruals**	**Earnings**	**Cash Flow**	**Sales**
1990	(0.0902)	0.1038	0.1940	12.880
1991	(0.1072)	0.0905	0.1977	12.260
1992	(0.0898)	0.0895	0.1793	12.673
1993	(0.0926)	0.0671	0.1597	12.408
1994	(0.1418)	0.0538	0.1956	11.846
1995	(0.1835)	(0.0133)	0.1701	12.059
1996	(0.1012)	0.0702	0.1714	11.755
1997	(0.1087)	0.0483	0.1570	11.689
1998	(0.1164)	0.0620	0.1785	11.494
1999	(0.1244)	0.0425	0.1669	11.365
2000	(0.1354)	0.0379	0.1733	11.322
2001	(0.1348)	0.0096	0.1444	11.016
2002	(0.1456)	0.0139	0.1595	11.195
2003	(0.1321)	0.0240	0.1561	11.367
2004	(0.1381)	0.0244	0.1626	11.572
2005	(0.2073)	0.0486	0.2559	11.900
2006	(0.1072)	0.0682	0.1754	12.027
2007	(0.1623)	0.0670	0.2293	12.147
2008	(0.1296)	0.0812	0.2108	12.226
2009	(0.1373)	0.0319	0.1692	11.266
1990-2009	(0.1357)	0.0447	0.1804	11.667
Panel B Mid Accruals				
Year	Accruals	Earnings	Cash Flow	Sales
1996	(0.0322)	0.0817	0.1139	12.700
1997	(0.0301)	0.0731	0.1032	12.490
1992	(0.0269)	0.0641	0.0910	12.460
1993	(0.0256)	0.0672	0.0927	12.268
1994	(0.0262)	0.0669	0.0931	12.424
1995	(0.0397)	0.0717	0.1113	12.135
1996	(0.0288)	0.0770	0.1057	11.818
1997	(0.0265)	0.0731	0.0996	11.791
1998	(0.0337)	0.0731	0.1068	11.593
1999	(0.0334)	0.0665	0.0999	11.555
2000	(0.0357)	0.0666	0.1023	11.702
2001	(0.0390)	0.0558	0.0948	11.763
2002	(0.0408)	0.0528	0.0936	11.508
2003	(0.0353)	0.0580	0.0933	11.610
2004	(0.0334)	0.0698	0.1032	11.795
2005	(0.0345)	0.0701	0.1046	11.958
2006	(0.0335)	0.0733	0.1068	12.059
2007	(0.0297)	0.0609	0.0906	12.159
2008	(0.0359)	0.0652	0.1011	12.274
2009	(0.0385)	0.0669	0.1053	11.337
1990-2009	(0.0340)	0.0661	0.1001	11.857

Table 6 provides the means of earnings, accruals, and cash flow (as defined in equations 1 and 2) along with a proxy for size (i.e., the natural logarithm of total assets) for Latin American firms. The sample (Mexico, Chile, and Argentina), described in the "Data" section, covers the 1990-2009 period for a total of 14,039 number of observations. Every year, all firms in the sample are ranked according to the magnitude of accruals and assigned to one of five quintile portfolios. ***Low Accruals*** *contains firms categorized in quintile 1,* ***High Accruals*** *contains firms categorized in quintile 5, and* ***Mid Accruals*** *contains the average of quintiles 2, 3, and 4.*

Table 6: – Continued.

Panel C High Accruals				
Year	Accruals	Earnings	Cash Flow	Sales
2002	0.0389	0.1294	0.0904	12.304
2003	0.0518	0.0821	0.0303	12.178
1992	0.0352	0.0850	0.0498	12.348
1993	0.0664	0.0925	0.0261	12.238
1994	0.0686	0.0690	0.0004	12.035
1995	0.0546	0.0651	0.0105	11.283
1996	0.0423	0.1205	0.0782	11.369
1997	0.0558	0.0786	0.0228	11.217
1998	0.0781	0.0622	(0.0159)	10.951
1999	0.0310	0.0572	0.0262	11.123
2000	0.5383	0.0320	(0.5063)	10.794
2001	0.0390	0.0353	(0.0037)	10.806
2002	0.0476	0.0316	(0.0160)	10.852
2003	0.0457	0.0291	(0.0167)	10.750
2004	0.0396	0.0609	0.0213	11.330
2005	0.0408	0.0667	0.0259	11.511
2006	0.0425	0.0468	0.0043	11.762
2007	0.0438	0.0767	0.0329	11.834
2008	0.0425	0.0493	0.0068	12.025
2009	0.0254	0.0593	0.0339	11.134
1990-2009	0.0828	0.0569	(0.0259)	11.318

CONCLUSIONS

This study investigates the nature of the relationships among earnings, accruals, and cash flows for Latin American firms. In particular, publicly traded firms from Mexico, Chile, and Argentina are examined. Results are compared to previous results for U.S. firms. We find that Latin American firms, on average, yield very low earnings relative to assets compared to the U.S. (6% compared to 12.1%). The difference on reported earnings is consistent on both the accrual and cash flow component of earnings. That is, accruals for Latin America are lower than the U.S., and cash flow for Latin America are lower than the U.S. as well. In general, as expected given the level of sophistication of these capital markets, results for Latin America as a group are less stable than the U.S. market. Among Latin American countries, Mexico reports the highest and most stable level of earnings. The average reported earnings (7%) for Mexico is statistically different to average earnings for Argentina and Chile at the 1% significance level. Mexico, however does not report the highest cash flow, but the 9.6% level of cash flow reported for Mexico is not statistically different from the cash flows of Chile and Argentina.

Depreciation and amortization (*DA*) is the largest component of accruals across all countries, and it is the most stable component as well. This could be explained by the nature of this item related to *permanent* assets. Excluding depreciation and amortization, net operating working capital relative to total assets, defined as $\Delta AR+\Delta INV-\Delta AP$, is the main component of accruals. Net operating working capital for Latin America as a group is 0% relative to total assets, compared to 4.3% for the U.S. This difference could be of economic importance since it represents, for Latin American firms, cash that does not need to be tied to operations compared to the average U.S. firm. This amount for the U.S. represents almost one third of average reported earnings.When firms are sorted by level of accruals and categorized in accruals decile portfolios, we find a tendency towards a negative monotonic relationship between accruals and cash flow across portfolios. When statistical tests are performed, we find that only accruals decile portfolios 1, 9, and 10 are statistically different from the rest of portfolios in terms of cash flow means, with high accrual

portfolios 9 and 10 reporting the most deteriorated level of cash flows and low accrual portfolio 1 reporting the highest cash flow level across all portfolios. Results for the level of accruals across portfolios follow a similar pattern. However, results for earnings are slightly different. We find that high accrual portfolios (decile portfolios 8, 9, and 10) do not report the highest level of earnings. This result differs from what have been reported before in empirical studies for US firms. Thus, sorting firms by level of accruals provides new insights not shown when earnings are analyzed. Of economic importance is the fact that Latin American firms reporting the lowest level of earnings (2.5%) report the highest level of cash flow relative to assets (21.5%). More importantly, firms reporting the highest level of accruals, but not the highest level of earnings, have the worst cash flow (negative 9.7%).

When we disaggregate results by years, it is found that that high accrual firms consistently report relative high earnings but low levels of cash flow. Further, the gap between earnings and cash flow is higher after the year 2000, making this problem more current. Finally, we find that high accrual firms (i.e., reporting the most deteriorated cash flows) in most of the cases are the smallest firms in the sample.

The simple relationships evidenced in this study for Latin American firms are of importance given that investors are very oriented towards firms yielding high earnings and might fail to realize that earnings are not always accompanied by a strong level of cash. Further, the relationship between accruals and earnings is not always positive. These relationships form the basis for the "accrual anomaly" hypothesis formulated by Sloan (1996) for US firms that investors are earnings-oriented and do not recognize the information on accruals when implementing their trading strategies (i.e., accruals and *expected* stock returns have a systematic relationship). A limitation of this study is that we are not testing that hypothesis, but we are rather limiting the scope of the study to tests the relationships among earnings, accruals, and cash flows for Latin America firms, not studied before. Thus, future research could focus on testing different asset pricing models for this problem. This may represent a challenge since the validity of asset pricing models such as Fama and French 3-Factors Model and the 4-Factors Momentum models have not been widely implemented and tested in Latin America.

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ACKNOWLEDGEMENT

The authors wish to thank the anonymous reviewers and the managing editor for their excellent comments in the peer review process. The comments of participants in the 2010 International Business and Economy Conference (IBEC) in Prague, Czech Republic have also contributed to improve the quality of the article. This article received an outstanding research award in the Costa Rica 2011 Global Conference on Business and Finance. All mistakes are the sole responsibility of the authors.

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FINDING THE OUTER LIMITS OF IRS ACCOUNTING DISCRETION: THE KOLLMAN CASE

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ABSTRACT

The statutory language of the Internal Revenue Code gives cognizance to the methods of accounting used by taxpayers for their financial reporting. The 1979 U.S. Supreme Court opinion of Thor Power acceded to the Internal Revenue Service a significant amount of discretion in its attempt to require taxpayers to change and adapt their accounting methods to its satisfaction. In particular, the Commissioner of Internal Revenue's seemingly absolute authority to prohibit lower of cost or market inventory valuation was upheld. Until the recent Tax Court decision in the case of United States v. Kollman, in fact, there were few guidelines that helped to delineate the outer limits of the IRS's discretion in demanding taxpayer adherence to its preferred tax accounting methods. This paper considers how the parameters for a taxpayers' ability to challenge this discretion have been significantly clarified, if not changed, by the Kollman case. We discuss the clear reflection of income doctrine as it has evolved over time and examine the impact of recent judicial decisions – especially Kollman – on this standard and consider whether or not there is need for revision on the law in this area. We conclude that the Commissioner's authority to arbitrarily require specific methods of accounting is in fact limited, and that the Kollman case serves as a helpful marker of the outer limits of such authority.

JEL: M4, M40, M41

KEYWORDS: Tax accounting, lower of cost or market, inventory valuation, tax administration

INTRODUCTION

Tax accounting in the United States is not a science. Indeed, it is not even an art. It is more of a dance, a negotiated process that involves a leader and a follower. The leader, at least since the U.S. Supreme Court decision in the case of *Thor Power Tool Co. vs. Commissioner* (439 U.S. 522, 1979), is the Internal Revenue Service (or, more properly, its head, the Commissioner of Internal Revenue). The followers are the U.S. taxpayers, that is, those individuals, business organizations and other entities that must rely on tax accounting principles in the derivation of the taxable income that they report for federal income tax purposes.

Generally, such entities are allowed to choose their own method of accounting for both tax and financial purposes. However, Internal Revenue Code (IRC) §446 appears to grant broad discretion to the Commissioner of Internal Revenue (Commissioner) to make determinations regarding a taxpayer's method of reporting income for tax purposes. A significant number of court cases have supported and even expanded on this provision while others have supported challenges to the apparently broad authority granted to the Commissioner. This paper will look at the determination of the Commissioner's authority by examining cases that appear to have been influential in establishing this authority. We will look at the relationship between financial and tax income and the implications of this relationship for the Commissioner's authority to require changes of accounting method under the clear reflection of income standard. We will examine the idea of the Commissioner's ability to determine what method clearly reflects a taxpayer's taxable income in general and in the context of inventory valuation. We will look at cases that have addressed this issue in prior years and compare/contrast the findings with a more recent case which appears to challenge the Commissioner's authority to change an entity's method of reporting

income under the "clearly reflects income" standard. The primary question being asked here is whether the Commissioner's authority to demand adherence to its preferred accounting methods is absolute. Or, are there expectations that such accounting methods be reasonable, or even coherent? If there are such expectations, those expectations are most likely to be articulated within the judicial system, because IRS requirements for specific accounting methods are subjected to judicial review. Within the legal system in the U.S., courts can determine whether the IRS has become too arbitrary or too strict in its imposition of accounting methods. A recent clash over tax accounting methods that resulted in the case reported as *United States v. Kollman* (105 AFTR 2d 1331, 2010), serves as a case study for this inquiry.

The remainder of the paper is organized as follows: review of literature, discussion of the clear reflection of income standard, discussion of inventory write-downs, considerations for revision of the clear reflection of income standard, and conclusion.

LITERATURE REVIEW AND BACKGROUND

The clear reflection of income standard has existed almost since the beginning of the IRC and related regulations. There have been various challenges to this standard over time. Before taking a closer look at the specifics of this standard in the light of *Kollman* and *Thor Power Tool*, we will take a brief look at some of the prior literature that examines this standard.

Malman (1981) examined the application of the clear reflection of income standard as it related to revenue recognition of prepaid income for tax purposes. She evaluated a variety of cases that both supported the application of the clear reflection of income standard and denied its application. She also discussed the inter-relationship between financial accounting and tax accounting and those implications for the clear reflection of income standard. She concluded that even though the Supreme Court has ruled on the revenue recognition issue for prepaid income for tax accounting purposes, there are still situations where the facts and circumstances allow differing treatment and that the discretion of the Commissioner does not appear to be absolute.

Dubroff, *et al* (1982) examined the legislative history of the clear reflection of income standard as it relates to IRC §446 and its related regulations. They were specifically looking at the interaction of financial and tax accounting rules and how they were to be applied under the clear reflection of income standard. They looked at specific examples from actual cases where generally accepted accounting principles (GAAP) were and were not determined to meet the clear reflection of income standard. They determined that under the established principles of administrative law that the determination of the Commissioner is to be generally presumed to be correct – in other words, that the Commissioner is vested with wide discretion that is not to be interfered with unless it is clearly unlawful in its application. They concluded that the disparity in application of the clear reflection of income standard related to the acceptance of GAAP as clearly reflecting income created significant problems for taxpayers

Morse (1999) examined the clear reflection of income standard in light of the "rule of law". He stated that the rule of law has been interpreted to be in place to protect the people from arbitrary government action. Given that the clear reflection of income standard appears to give the Commissioner very broad discretionary powers, Morse investigated the implication of this and its inter-relationship with the rule of law and the federal tax laws. He concluded that "the 'rough justice" of a rule has much to offer as compared with the uncertainty of discretion, which has flowed from the Commissioner's clear reflection power." (Morse, 1999, 539)

Root (2000) also looked at the rule of law and the balance between this and the rule of man in the legal system and related this to the clear reflection of income standard in IRC §446 and the Commissioner's discretionary powers. She discussed the impossibility of legislating for all contingencies and indicated

that this is part of the status quo of the current legal system. She concluded that the broad discretionary powers apparently granted to the Commissioner under this section are at odds with the rule of law and the desire by taxpayers for certainty in the application of the tax laws. She suggested that a reexamination of the discretionary powers under the clear reflection of income standard may be appropriate going forward.

DECIDING IF INCOME HAS BEEN CLEARLY REFLECTED

The Code and the Commissioner

IRC §446(a) states that "Taxable income shall be computed under the basis of which the taxpayer regularly computes his income in keeping his books" while IRC §446(b) states that "If no method of accounting has been regularly used by the taxpayer, or if the method used does not clearly reflect income, the computation of taxable income shall be made under such method as, in the opinion of the Secretary, does clearly reflect income" (26 USC §446, 2010). Treasury regulations interpret and expand upon this by stating "A method of accounting which reflects the consistent application of generally accepted accounting principles in a particular trade or business in accordance with accepted conditions or practices in that trade or business will ordinarily be regarded as clearly reflecting income, provided all items of gross income and expense are treated consistently from year to year" (26 CFR §1.446-1(a)(2), 2010). Taken together, the IRC and the regulations appear to give the Commissioner a broad brush to use to determine a taxpayer's method of accounting. However, the provisions also imply that conformity to GAAP and accepted practices in the business environment will generally be considered as "clearly reflecting income".

Interestingly, GAAP have not always been the standard for taxpayers when choosing a method of accounting for tax purposes. The Revenue Act of 1913 required a cash receipts and disbursements method of accounting for tax purposes making all taxpayers initially cash basis taxpayers (38 Stat. 166, 1913). The Revenue Act of 1916 amended existing law to include the term "clearly reflect income" for the first time. The Act provided the ability for taxpayers to report their income for tax purposes using a method other than the cash basis if such method clearly reflected their income for the year. Taxpayers were now able to prepare their return on the same basis as they keep their books "subject to Regulations made by the Commissioner of Internal Revenue" (39 Stat 763, 1916). GAAP was also recognized in regulations issued pursuant to IRC §49 (the predecessor section of IRC §446) under the 1939 Code, providing that approved standard methods of accounting will ordinarily be regarded as clearly reflecting income. Current Treasury regulations for IRC §446 (the successor to IRC §49) as stated above reflect very similar language as that from the 1939 Code and Treasury regulations.

Historically, until the late 1950s there was not much disagreement between taxpayers and the IRS regarding the acceptability of GAAP for tax purposes from the perspective of clearly reflecting income. The first real challenge to GAAP conformity clearly reflecting income came from a series of prepaid income cases from 1957 through 1963. In all 3 cases – *Automobile Club of Michigan vs. U.S.* (353 U.S.180, 1957), *American Automobile Association vs. U.S.* (367 U. S. 687, 1961), and *M. E. Schlude vs. U.S.* (372 U.S. 128, 1963) – the entities prorated, on a monthly basis, prepaid income for services to be rendered to members in the future. The Commissioner determined that this method of proration did not clearly reflect the income of the taxpayers and disallowed the proration even though it was in accordance with GAAP. The Commissioner's rationale, which was supported by the courts, was that the proration did not result in an appropriate matching of the revenues with the related expenses of the entities because the monthly proration did not reflect the reality of when the entities would be required to perform the services for their members.

In *Artnell Company* (400 F. 2d 981, 1968) the court found for the taxpayer in another prepaid income case and determined that the Commissioner had overstepped his authority in requiring a change in the

taxpayer's accounting method. The court found that the taxpayer had appropriately deferred recognition of the prepaid income and was correctly reflecting the deferred income in taxable income to result in an acceptable matching of costs and revenues, in other words, the GAAP treatment did clearly reflect the taxpayer's income. In *Cincinnati, New Orleans & Texas Pacific Railroad* (191 Ct. Cl. 572, 1970) the Court of Claims held that in determining if income is clearly reflected, GAAP "is entitled to some probative value". In an even more recent case, *Hopkins Partners vs. Commissioner* (T.C. Memo 2009-107, 2009) the court held that even though the Commissioner has broad discretion, he "cannot require a taxpayer to change from an accounting method that clearly reflects income merely because the Commissioner considers an alternate method to more clearly reflect income".

Under the law and regulations related to the Commissioner's authority to require a change of accounting method, it would seem that a method found to be in accordance with GAAP and consistently applied would ordinarily be presumed to clearly reflect a taxpayer's income. It would also seem that given much of the legislative history, consistent application of GAAP would appear to be a constraint on the Commissioner's ability to require a change in method away from a method that meets the requirements of GAAP. In the area of inventory valuation, however, there have been serious challenges to the consistent application of GAAP as a rebuttal to the Commissioner's determination that the method of reporting income used by the taxpayer does not clearly reflect income.

When making a determination regarding the clear reflection of income for matters relating to inventory valuation for an entity, the entity must look not only to IRC §446 and the related Treasury regulations but must also look to IRC §471 and the related Treasury regulations. IRC §471(a) states that "Whenever in the opinion of the Secretary the use of inventories is necessary in order clearly to determine the income of any taxpayer, inventories shall be taken by such taxpayer on such basis as the Secretary may prescribe as conforming as nearly as may be to the best accounting practice in the trade or business and as most clearly reflecting the income." While this section gives authority to require a change in the taxpayer's method of valuing inventory, it also indicates that conforming to best accounting practices is related to clearly reflecting income. This granting of authority to the IRS has also been challenged and commented on by the courts. One of the most well-known cases related to inventory valuation and the clear reflection of income standard is the *Thor Power* case.

Thor Power's Influence on the Clear Reflection of Income Standard

Thor Power Tool Co. vs. Commissioner (439 U.S. 522, 1979) seems to be viewed as the "landmark" case when it comes to discussing the Commissioner's influence on determining a taxpayer's method of calculating income, especially with regard to inventory valuation. In *Thor,* the company manufactured hand held power tools and replacements parts for these tools. Since the cost of retooling the machinery to manufacture the replacement parts for the tools was high, *Thor* manufactured and held all replacement parts management believed they would need over the lifetime of the tool the replacements related to at one time. Because these replacement parts relate to specific tools, demand for the replacement parts was not very sensitive to price and so price reductions for the replacement parts would not generally increase the sales of these replacement parts. *Thor* had always used the lower of cost or market treatment for valuing their inventory of both power tools and replacement parts for both tax and financial accounting purposes.

After a management change in the 1960s, it was decided that the inventory of the company was overvalued in general and several groups of items were either written down or written off. *Thor* wrote off/wrote-down about $3 million of obsolete parts and damaged or defective tools, replacement parts that related to unsuccessful power tools, and similar items. These items were either actually scrapped shortly after the write-downs or were sold at reduced prices. The Commissioner did not challenge these write offs/write-downs due to the scrapping of some of the items and the sale at reduced prices of others.

In addition to the previously mentioned write offs and write-downs, a decision was made that the excess parts for models of power tools that *Thor* had ceased production on were "excess inventory" i.e., the amount of parts on hand was in excess of any reasonable future demand for the parts. Management decided to write this portion of its inventory down to its net realizable value which they determined to be the scrap value for most of the excess inventory. *Thor* did not scrap these "excess" inventory items and in fact maintained them as a part of its inventory held for sale at their original price. As stated earlier, management believed that the demand for the items was not sensitive to price and therefore lowering the price would not result in additional sales. *Thor's* method of determining the value of this inventory was in accordance with its lower of cost or market method of accounting for inventory that it had been using consistently for both tax and financial accounting purposes.

The Commissioner disallowed this last write-down claiming that it was not authorized by the Treasury regulations and determined that the write-down did not clearly reflect *Thor's* income for tax purposes. The Supreme Court upheld the disallowance and determined that the Commissioner had not abused his discretion. While the Treasury regulations under IRC §471 do authorize write-downs for the lower of cost or market method for FIFO (but not LIFO) (26 CFR § 1.471-4(a), 2010) and for damaged goods (26 CFR §1.471-2(c), 2010), they do not contain any specific provisions for excess inventory. *Thor* argued that the adjustments were in conformity with GAAP and that they were in accordance with IRC §471. As stated earlier, IRC §471 indicates that methods conforming to GAAP are considered to most clearly reflect income. The Treasury regulations under IRC §471 expand upon this to provide guidance on the write-down of inventory. Treasury regulations expand upon the two tests of IRC §471 of conforming to best accounting practices and clearly reflecting income (26 CFR §1.471-2(b), 2010). The regulations state that "inventory rules cannot be uniform but must give effect to trade customs which come within the scope of the best accounting practice in the particular trade or business. In order clearly to reflect income, the inventory practice of a taxpayer should be consistent from year to year, and greater weight is to be given to consistency than to any particular method of inventorying or basis of valuation so long as the method or basis used is in accord with §§1.471-1 through 1.471-11." *Thor* argued that this regulation would appear to give more weight to conformity with GAAP as clearly reflecting income and therefore the Commissioner should not be allowed to require a change in their method of valuing their inventory since their current method was in accordance with GAAP.

The Court determined that in *Thor Power* the taxpayer did not meet the requirements of the Treasury regulations requiring an actual offer of inventory at a reduced price to determine a lower market value for the inventory (26 CFR §1.471-2(c), 2010). Nor did the taxpayer meet the requirement that if there is no market price available due to an inactive market for the goods, then a market price can be determined by a sale price from a sale offered near the inventory date (26 CFR §1.471-4(b), 2010). Accordingly, since the taxpayer met neither of these conditions, the Court held that it did not meet the requirements of IRC §471 and therefore the Commissioner's disallowance of the write-down was upheld. Thor Power argued that since there is no specific provision in the Treasury regulations that related to "excess" inventories, their treatment of the items was acceptable because it was in accordance with GAAP. The taxpayer also argued that since their method was in accordance with GAAP – the first of the IRC §471 tests, then there should be a presumption that the method used clearly reflected their taxable income. The IRS agreed that the method was in conformity with GAAP but did not agree that this created a presumption of clearly reflecting income for tax purposes.

While the Court did agree that *Thor's* treatment was in accordance with GAAP, they did not agree that being in accordance with GAAP created a presumption that the method clearly reflected income and therefore negated the Commissioner's ability to require a different method of accounting for tax purposes. The Court stated that the Code and Treasury regulations grant broad discretion to the Commissioner to change the taxpayer's method of accounting if his opinion is that the method used does not clearly reflect income. The Court stated that the language of the Code and Treasury regulations is contrary to a

presumption in favor of the taxpayer – that the language only states that in most cases GAAP will be acceptable for tax purposes. However, if the Commissioner determines that GAAP is not acceptable, he may require a different method without having to rebut any presumption in favor of the taxpayer. These statements appear to give almost unlimited authority to the Commissioner to make the determination of what methods do or do not clearly reflect income without giving weight to GAAP considerations. In fact the Court went so far as to say that the Code and Treasury regulations "leave little doubt as to which test is paramount. While § 471 of the Code requires only that an accounting practice conform "as nearly as may be" to best accounting practice, the Treasury regulations state categorically that "*no* method of accounting is acceptable *unless*, in the opinion of the Commissioner, it clearly reflects income" (emphasis added) (26 CFR §1.446-1(a)(2), 2010). Most importantly, the Court concluded that the Code and the Treasury regulations give the Commissioner broad discretion to set aside the taxpayer's method if, in the Commissioner's opinion, the taxpayer's method does not reflect income clearly.

This language in the Court's opinion appears to grant almost unlimited power to the Commissioner to apply the clear reflection of income standard. It would seem from IRC and the regulations, as interpreted in *Thor Power,* that taxpayers who are relying on conformity with GAAP to support a method that clearly reflects income need to be more concerned post *Thor Power Tool.* It would seem that this decision makes it almost impossible for taxpayers to challenge the Commissioner's determination of what does or does not clearly reflect income.

Is the Commissioner's Power Unlimited?

Seago and Schnee (2005) examined the deference that should be paid to the Commissioner regarding the clear reflection of income standard. While they were examining deference with respect to whether or not courts should defer to the decisions of administrative bodies related to their interpretations of regulations, their investigation provides insight into the limits – or lack thereof – on the Commissioner's power to require a change in accounting method under the clear reflection of income standard. The authors refer to the *Thor Power Tool* decision and the wide discretion granted to the Commissioner in determining whether a particular method of inventory accounting should be disallowed as not clearly reflective of income. They observe that "the Commissioner's interpretation of the statute's clear reflection standard "should not be interfered with unless clearly unlawful"". (Seago and Schnee, 2005, 190) Also, "(t)he commissioner's determination with respect to clear reflection of income is entitled to more than the usual presumption of correctness, and the taxpayer bears a heavy burden of overcoming a determination that a method of accounting does not clearly reflect income. (Seago and Schnee, 2005, 190) Finally, "(t)he respondent's determination pursuant to his authority under § 446(b) is presumptively correct and must be upheld unless the petitioner has proved it clearly erroneous or arbitrary". (Seago and Schnee, 2005, 190) These comments would seem to support a more unlimited role for the Commissioner in determining what does or does not clearly reflect income. However, as was discussed earlier, there have been challenges to the Commissioner's discretionary application of the standard and also there is a certain logic that must be examined regarding this provision.

While the Supreme Court acknowledged in *Thor Power* that the clear reflection of income test is paramount, and while Seago and Schnee provide evidence from other cases to support limited challenges to the Commissioner's authority, the logic of the Code and the Treasury regulations does not seem to allow for completely unlimited power to be granted to the Commissioner in applying the clear reflection of income standard. IRC §446 does not include reference to best accounting practices or to GAAP but the Treasury regulations under this section suggest that GAAP results in a clear reflection of income. If the clear reflection prong is paramount under IRC §471 as the Court determined in *Thor Power Tool*, and given that the Treasury regulations for IRC §446 support the position that GAAP results in the clear reflection of income then it would seem that the power of the Commissioner should not be considered unlimited. Conformity with GAAP should be a valid argument to defend a taxpayer's method of

accounting as clearly reflecting the taxpayer's income for tax purposes. *United States v. Kollman*, discussed below, provides significant additional support for the notion that there are indeed limits to the Commissioner's discretion in applying the clear reflection of income standard related to inventory valuation.

INVENTORY WRITE-DOWNS IN THE *KOLLMAN* CASE

Background: The Rise and Fall of the Cell Tech Business

The factual narrative of the case of *United States v. Kollman* (105 AFTR 2d 1331, 2010), as related in the cited federal district court opinion as well as in one of the taxpayer's trial briefs (2009 WL 5193677, 2009), involves a perfect storm of events that highlight the potential harshness of IRS arbitrariness in unilaterally determining whether a tax return constitutes a clear reflection of income. In 1982, Daryl J. Kollman and Marta Carpenter, his wife, founded a business that harvested, processed, and sold *Aphanizomenon flos aquae* algae as a nutritional supplement. They began to harvest this blue-green algae from Upper Klamath Lake, the largest freshwater lake in Oregon and one of the largest in the United States. The business operated through two S corporations, The New Earth Co. and The New Algae Co., which were each half-owned by Kollman and Carpenter. For tax purposes, the corporations' income was attributed to Kollman and Carpenter. Together these two corporations sold the nutritional supplements under the trade name "Cell Tech". Kollman designed harvesting equipment and was the business's inspirational leader, while Carpenter ran day-to-day operations.

From 1990 through 1996, Cell Tech experienced phenomenal growth. In 1990, Cell Tech had sales of about $ 10 million, but by 1996, this small Oregon operation had reached sales exceeding $194,000,000.00. Cell Tech's products were sold across the United States and Canada through 350,000 individual distributors. Cell Tech expected sales to continue increasing the following year.

Given the rapid exponential growth of sales, Cell Tech was having serious supply issues. The algae only bloomed during the summer months, and harvesting of the raw material used in the products could only occur during a few months of the year. To meet the increasing demand for Cell Tech's products, in 1996 Kollman and Carpenter decided to build a state-of-the-art harvesting plant at one of the canal sites adjacent to Upper Lake Kamath, at a cost of about $ 20 million. The new harvesting facility required 900 gallons of fresh water per minute. Cell Tech drilled a well nearby, but it produced less than 50 gallons per minute and was abandoned. A second well produced about 200 gallons per minute. Cell Tech was forced to redesign the harvesting facility to incorporate a reserve water tank. The second well is still in use, but only to supply water for an employee break room.

At a cost of $ 450,000, Cell Tech also installed a reverse osmosis system in 1996 to extract water from harvested algae. The osmosis system was intended to reduce the cost of transporting and processing algae. On its first run, however, the osmosis system failed, ruined by water containing bentonite, a fine clay that had been used to seal the newly drilled well. The system's vendor told defendants that the clogged membranes could not be repaired and that the entire osmosis system would have to be replaced. As of late 1998, Cell Tech concluded that the system was worthless, even as scrap, and abandoned it in place.

In approximately that same period, Cell Tech learned that it had received incorrect state sales tax advice from its attorneys related to sales to its multi-level distributors. As a result, in the same time period that Cell Tech was frantically building its multimillion dollar expansion of harvesting operations, it had to come up with millions of dollars in state sales taxes.

Cell Tech used screens to harvest the blue-green algae *Aphanizomenon flos aquae* from irrigation canals fed by Upper Klamath Lake. After Cell Tech had cleaned and frozen the algae, a third-party contractor

freeze-dried it, converting it to powder. Cell Tech used the powdered algae in its finished products, which were mainly food supplements for human consumption. In addition to the *Aphanizomenon flos aquae* algae harvested by Cell Tech, a second algae occurs in Klamath Lake, *Microcystis aeruginosa*, which produces microcystin, a potent liver toxin. In 1996, the Oregon Department of Agriculture considered restricting microcystin content to one part per million in finished products for human consumption. Cell Tech opposed the regulation, citing its experts' opinion that a microcystin content of five parts per million was safe for human consumption. No other jurisdiction had imposed a similar restriction on microcystin content. Despite Cell Tech's objections, however, the regulation took effect on October 20, 1997.

The microcystin regulation was an immediate public relations disaster for Cell Tech. Sales fell as customers worried that Cell Tech's food supplements were unsafe. In 1997, Cell Tech's gross receipts were about $ 113 million, down more than $ 80 million from 1996. In 1998, gross receipts were about $ 69 million; in 1999, $ 52 million; and in 2000, $ 37 million. After Oregon's ruling regarding microcystins, the companies had significant inventories of unsalable raw material, and excess capacity costs which resulted from the decrease in demand. A $20,000,000 improvement to one of the harvest sites at a canal had to be abandoned in 1998, along with a significant amount of other assets, when management determined to start harvesting solely on the lake.

After the regulation took effect, Carpenter hoped that Cell Tech would discover a novel use for the frozen contaminated algae or find a method to extract microcystins. She testified, "Given here that [the algae] was frozen, once you have it and you throw it out and then you discover, oh, my goodness, you can make biofuel out of it, it's -gone." Cell Tech never found a use for the contaminated algae, however.

Although most of its products were food supplements, Cell Tech did sell shampoo and soil amendments. Because the shampoo contained less than a gram of algae per unit, it would have used only a tiny fraction of the contaminated algae. Cell Tech also considered using frozen contaminated algae as a soil amendment, but in bulk form the algae was difficult to transport and even more difficult to spread. Freeze-drying the algae for conversion to powder would have been prohibitively expensive. Cell Tech could not even give the contaminated algae away to local farmers. One person who did accept a free sample of the algae discovered that it thawed into a stinking, viscous mess, useless as a soil amendment.

Cell Tech eventually found itself with millions of dollars of worthless inventory, plummeting sales, harvesting capabilities that far exceeded the new lower demand, and state and federal tax liabilities that greatly exceeded the companies dwindling income or cash reserves. This perfect storm of events almost consumed the company, and left its two original sole shareholders with massive federal and state tax liabilities.

In an attempt to help pull themselves from the problems facing the companies, Kollman and Carpenter hired numerous "experts". Unfortunately, these "experts" provided advice, and solutions that were anything but expert. Ultimately Kollman agreed to a plan involving the reverse merger of The New Algae Company and The New Earth Company with a shell company called Humascan. The New Algae Company and The New Earth Company became wholly owned subsidiaries of Humascan in August of 1999, which then immediately changed its name to Cell Tech International Incorporated and became a publicly traded corporation. After the reverse merger in August of 1999, Kollman was removed from any position of authority or control over the business entities and Carpenter became president and CEO of Cell Tech International. In addition, after the reverse merger, the business entities all became C corporations, and they no longer would "flow through" losses or profits.

In October 1999, Cell Tech International entered into a financing agreement with a private investor. Kollman and Carpenter then each owned more than 40% of the shares of Cell Tech International. As the company continued its downward spiral, by late 2004 the terms of the financing agreement granted the

private investor ownership of more than 90% of the company. The ownership share of Kollman and Carpenter correspondingly dwindled to about 3% each. In the wake of this disaster, Kollman and Carpenter were divorced, and Carpenter was replaced in 2005 as CEO of Cell Tech International. The business now operates under the trade name Simplexity Health.

Denial of the Applicability of *Thor Power*

The primary tax accounting issue involved in the *Kollman* case was the deductibility of its write-down of contaminated inventory. The government challenged the write-down of inventory as a matter of both fact and law, but the court held otherwise. For this reason, the case allows for a careful reconsideration of the extent of the Commissioner's authority to dictate inventory accounting methods and, by extension, tax accounting methods generally.

At first glance, the *Kollman* case seems to have a lot in common with *Thor Power*, described above. Both cases involved the write-down of inventory that was no longer of any practical use or value. In both cases, the inventory write-down was consistent with generally accepted accounting principles, which require annual adjustments for the purpose of carrying of inventory assets at the lower of cost or market value. Both cases invite the application of §471 of the IRC, which calls for the taking of inventory values on such basis as the Commissioner of Internal Revenue "may prescribe as conforming as nearly as may be to the best accounting practice in the trade or business and as most clearly reflecting income" (26 U.S.C. §471).

As viewed in light of this section of the IRC, both cases also draw attention to the subtle conflict between the best accounting practice (which, for financial reporting purposes, requires write-downs of inventory as a proper application of the lower of cost or market protocol within the principle of accounting conservatism), and the preferred IRS method, which disallowed write-downs of obsolete or contaminated inventory and which was supported by the United States Supreme Court in the *Thor Power* decision. Indeed, Professor W. Eugene Seago, a prominent tax scholar and expert on the legal implications and applications of *Thor Power* (a scholarly authority who has already been cited in this paper in connection with that case), personally provided expert testimony in the *Kollman* trial and argued that *Thor Power* effectively precluded a tax deduction for a write-down of contaminated algae inventory.

In the *Kollman* decision, however, the U.S. District Court in Oregon brushed aside the similarities between the case at hand and the *Thor Power* case by determining that there is a significant difference between substandard inventory and excess inventory. The district court judge pointed out that in *Thor Power*, the inventory was not defective, just surplus, so it still had value. After making this distinction, the court concluded that despite the many similarities, the *Thor Power* case did not apply, and was not determinative, in the *Kollman* matter.

Application of Treasury Regulation

As noted above, §471 of the IRC, which calls for the taking of inventory values on such basis as the Commissioner of Internal Revenue may prescribe as conforming as nearly as may be to the best accounting practice in the trade or business and as most clearly reflecting income. As is often the case, the government "prescribes" accounting methods for inventory and other items by issuing regulations.

Regulations issued in interpretation of IRC §471 include Treasury regulation 1.471-2 (26 CFR 1.471-2, 210), which requires that for devaluation of substandard goods on a tax return, a bona fide selling price must be established by evidence of actual offering prices for the goods within 30 days of the inventory date. No further guidance, such as how the goods may be offered for sale, or what kind of evidence is required in order to prove that the substandard goods were offered for sale, is provided in the regulation.

To make matters worse for the taxpayer, the taxpayer generally has the burden of showing the subnormal nature of the goods and maintaining records verifying its disposition (*Altec. Corp. v. Commissioner*, T.C. Memo. 1977-438, 1977).

In the *Kollman* case, the IRS asserted that there was no evidence that there was an actual offering of the contaminated inventory for sale within 30 days of the inventory date, i.e. within the last 30 days of the 1997 tax year or the 1998 tax year. Even though cell Tech attempted to give the algae away to local farmers, the company did not provide evidence of when this attempt to give away the raw algae to local farmers occurred. The IRS also observed that there was no actual attempt to try to sell the raw inventory outside of Oregon

Not that it would have mattered if Kollman and Carpenter could have provided timely evidence of their attempts to sell or give away the contaminated algae inventory. That is because there is another set of hurdles: even if a taxpayer is able to show that substandard inventory has been offered for sale in accordance with the regulations, and is able to provide evidence to the satisfaction of the government in this regard, the taxpayer is not necessarily entitled to deduct the write-down of the substandard inventory. The taxpayer must first qualify for using the lower of cost or market method of accounting for inventory, and, according to Treasury Regulation 1.471-2, must obtain permission from the Commissioner of Internal Revenue. In the *Kollman* case, the government argued that the company's effort to reevaluate the algae from a cost basis to a lesser of cost or market basis required prior consent from the government for a change in accounting method. Since such consent had not been requested or consented to by the IRS, the government argued that the taxpayer was not entitled under any circumstances to such a write-down.

The *Kollman* court responded to these hurdles by offering its own technical reading of the treasury regulation. The court observed that the regulation indicated that for defective or damaged raw inventory, the determination of value is any reasonable basis, taking into consideration the usability and the condition of the goods. In other words, the court inferred that the regulations provide for the reasonable valuation of raw materials, regardless of the method of accounting utilized for valuing finished products. As a result, the court determined that no change in accounting method was occurring, and so no permission was needed. In so doing, the court disregarded the government's claim that its prior permission to write-down the inventory would have been required, and allowed the deduction by the taxpayer.

HIGHLIGHTING THE NEED FOR GREATER OBJECTIVITY

The Need to Avoid Second-Guessing Taxpayer Intentions for Obsolete Inventory

The IRS arguments for the denial of a write-down deduction, based on the *Thor Power* decision, reveal a somewhat less than objective approach to its application. First, the IRS assumed that Cell Tech was effectively hedging its bets by purposefully maintaining excess or worthless inventory in the hope that such inventory would increase in value at a later date. That way, the IRS claimed, the company could wait to find out whether it could eventually find a way to recover much of the value and, if not, retroactively claim a deduction in past years (that is, in those prior years during which the company had made the choice to maintain the inventory in the first place).

In the *Thor Power* case, it appears that this in fact was the Corporation's strategy, to minimize costs of production the taxpayer produced and maintained a large inventory of small tools and replacement parts. It wrote down over 44,000 items of inventory for book and tax purposes for the portion of inventory that management concluded was "excess" inventory that could not be immediately sold. The taxpayer retained the excess items and continued to sell them, although management believed that some of the inventory would eventually remain unsold. The Supreme Court ultimately concluded that the taxpayer in that case could not deduct its excess inventory because it had not suffered a loss at the time it claimed a deduction

for excess inventory. The taxpayer had intentionally manufactured excess spare parts, and maintained such spare parts "on hand, just in case," and the taxpayer could not claim a deduction without scrapping the goods that it contended that it could not sell instead of simply holding onto the inventory hoping it could use the inventory in the future.

In the *Kollman* case, even though the taxpayers held out hope that they would someday find a use for the contaminated inventory, the inventory was, nevertheless, just that: contaminated. As soon as the 1997 Oregon administrative ruling outlawed green algae with more than a trace amount of microcystin, the Cell Tech inventory became virtually worthless. In effect, the preliminary announcement of the forthcoming administrative ruling rendered the inventory worthless as early as 1996. There is nothing in the facts of the *Kollman* case that hints at the possibility of a management strategy of producing excess inventory in the hope of parlaying that inventory into some level of marginal profits. That may have been the strategy in *Thor Power*, but in the *Kollman* case the taxpayers were hit with a series of events, all of them completely out of the control of the taxpayers, that resulted in virtually worthless inventory. There was never a reliable indication of any kind that the contaminated algae would produce more than mere scrap value. From the perspective of management strategy and intent, then, there is no similarity between the *Kollman* case and *Thor Power*.

The Need for Greater Regulatory Coherence Regarding Inventory Accounting Methods

As described above, the Supreme Court in *Thor Power* observed that sections 446 and 471 of the IRC vests the Commissioner with wide discretion in determining whether a particular method of inventory accounting should be disallowed as not clearly reflecting income. The Court affirmed the lower court's decision, sustaining the Commissioner, that although the taxpayer's write-down of "excess" inventory did conform to the best accounting practice in the trade or business and thus satisfied one first test of the regulations, it nevertheless failed to clearly reflect the taxpayer's income. The Court stated that where a taxpayer, under the "lower of cost or market" method of accounting, values its inventory for tax purposes at "market" (replacement cost), the taxpayer is permitted to depart from replacement cost only in those specific specified situations set forth in the Treasury regulations. When such a departure to a lower inventory valuation is made, for example, the Treasury regulations require that it be substantiated by objective evidence of actual offerings, sales, or contract cancellations and further require that records of actual dispositions be kept. The Court concluded that because the taxpayer provided no objective evidence of the reduced market value of its excess inventory, its write-down was plainly inconsistent with the Treasury regulations and was properly disallowed by the Commissioner. The taxpayer could not have properly taken advantage of any permitted write-downs since it did not scrap its "excess" inventory nor sell or offer it for sale at prices below replacement cost (IRS Revenue Ruling 80-60, 1980).

The court in *Thor Power* did not analyze, critique, or offer any judicial review of the Treasury regulations under §471 of the IRC. It simply enforced them. Of course, the court could not have anticipated cases like the *Kollman* scenario where a taxpayer may not have elected (or perceived a need for) the lower of cost or market inventory accounting method prior to a catastrophic or unexpected situation that resulted in substandard inventory. Similarly, the Treasury Department could not have anticipated these kinds of circumstances when it drafted the regulation in the first place. But as a matter of principle, the Internal Revenue Service is not opposed to the lower of cost or market method of accounting for inventory; in fact, that method is a "permissible" method to which the IRS readily consents (IRS Rev. Proc. 2008-52, 2008).

As a consequence of the Treasury regulations under §471 of the IRC, as upheld by the US Supreme Court in the *Thor Power* decision, write-downs of substandard inventory are deemed to clearly reflect the taxpayer's income so long as the taxpayer has requested permission from the Internal Revenue Service to use the lower of cost or market method (to which the IRS readily consents if asked prior to its auditing the

income tax return of the taxpayer). In other words, if the taxpayer requests permission to change to the lower of cost or market method of accounting on a Tuesday, and is audited the next day (Wednesday), this inventory method "clearly reflects income." But if the taxpayer is audited on Wednesday, and, upon realizing the need to change to the lower of cost or market method of accounting, requests permission to do so the next day (Thursday), the IRS will respond in the same manner as it did in the *Kollman* case. That is, the IRS will refuse permission to do so, and will pursue and conclude the audit of the taxpayer accordingly.

Similarly, if the taxpayer wishes to write-down the inventory value of substandard inventory, irrespective of the method of accounting, the regulations provide for such write-downs so long as the inventory in question involves raw materials or partly finished goods held for use or consumption. In such case, the taking of a tax deduction for such write-downs is deemed to be a clear reflection of income. If the inventory consists of something other than raw materials (or something other than partly finished goods held for use or consumption), such as raw materials that have gone through an initial processing step (and are not held for use or consumption by the taxpayer itself), then that initial processing somehow converts the inventory to a different category. In such case, the write-downs of substandard, partially processed materials (not held for use or consumption by the taxpayer itself) do not constitute a clear reflection of income under the regulations.

CONCLUSION

This paper has revisited the clear reflection of income standard as presented in the IRC and related regulations, in an effort to ascertain whether there are outer limits as to the authority of the Commissioner of Internal Revenue to prescribe taxpayer accounting methods. As part of our consideration of this issue, we discuss the clear reflection of income doctrine as it has evolved over time and examine the impact of recent judicial decisions – especially *Thor Power* and *Kollman* – on this standard in our effort to determine whether or not there may be need for revision on the law in this area.

This analysis has shown that the *Kollman* case, and in particular, the IRS objections to the write-downs of the contaminated inventory in that case, serve to highlight the lack of coherence in the Treasury regulations. This analysis has also shown that the determination as to whether substandard inventory is, on the one hand, merely "excess" inventory produced and held as a hedge against possible future price fluctuations, or, on the other hand, has suddenly become substandard for reasons entirely unrelated to management strategies, is a determination that involves second guessing by the IRS. The IRS is a government agency that is not necessarily equipped with the skills and insights required for such a determination in regard to the management challenges and tactics of privately held or publicly held business entities. The court in the *Kollman* case effectively required that when determining whether a taxpayer's accounting methods result in a clear reflection of income, the IRS should apply an objective standard that takes into account the facts and circumstances of each case, rather than a subjective or arbitrary standard that does not. In addition, the *Kollman* case reveals a certain level of incoherence and irrationality within the Treasury regulations. The case did not overturn those regulations, but the case does serve notice to the Treasury Department that those regulations ought to be revisited, reconsidered, and possibly rewritten.

Finally, the taxpayer victory in the *Kollman* case demonstrates that when the IRS interprets its own regulations too universally, too literally, and too strictly, it will lose. In other words, there in fact are limits to the discretion afforded the IRS in its effort to assert whether or not an accounting method constitutes a clear reflection of income, despite the seeming empowerment and authorization of the IRS's discretion granted by the *Thor Power* case. We conclude here that the Commissioner's authority to arbitrarily require specific methods of accounting is limited, and that the *Kollman* case serves as a helpful marker of the outer limits of such authority.

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