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LETTER FROM THE EDITORS

Welcome to the *Academy of Accounting and Financial Studies Journal.* The editorial content of this journal is under the control of the Allied Academies, Inc., a non profit association of scholars whose purpose is to encourage and support the advancement and exchange of knowledge, understanding and teaching throughout the world. The mission of the *AAFSJ* is to publish theoretical and empirical research which can advance the literatures of accountancy and finance.

As has been the case with the previous issues of the *AAFSJ*, the articles contained in this volume have been double blind refereed. The acceptance rate for manuscripts in this issue, 25%, conforms to our editorial policies.

The Editors work to foster a supportive, mentoring effort on the part of the referees which will result in encouraging and supporting writers. They will continue to welcome different viewpoints because in differences we find learning; in differences we develop understanding; in differences we gain knowledge and in differences we develop the discipline into a more comprehensive, less esoteric, and dynamic metier.

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Mahmut Yardimcioglu, Karamanoglu Mehmetbey University

Denise Woodbury, Southern Utah University

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KID IRAS: ENSURING A SECURE FINANCIAL FUTURE FOR YOUR CHILDREN

Denise Woodbury, Southern Utah University
Lon Addams, Weber State University
Kyle Mattson (deceased), Weber State University

ABSTRACT

This study provides insights into the value of providing greater financial future at retirement for children by establishing IRAs as minors. Developing the habit of saving early in life can result in a more secure financial future for a youth all the way to retirement. This study surveyed 92 of the best "fund families," as identified in Barron's. Approximately three-fourths of these fund families offer IRAs for children. Of these 71 fund families, 51 funds require a custodian's or guardian's signature. This paper explores the feasibility of a "kid" IRA.

INTRODUCTION

The IRA playing field has expanded. Traditional IRAs for children have been rare since children seldom have sufficient income to benefit from a tax deduction. However, a Roth IRA for a child can be very attractive, as discussed in this study. Hebert (2008) notes that if a minor child has earnings from a job, the parent would be wise to open a Roth IRA on behalf of the child. He further emphasizes that, like adults, children can make a Roth contribution of up to $5,000 or 100 percent of their earned income, whichever is less.

Many IRA providers, in fact, will establish an account for a minor. A minimum age is not required to establish a traditional or Roth IRA. Rather, to open a "kid" IRA a child must have taxable compensation income and an IRA provider who will establish an account.

Several advantages become evident in opening a kid IRA. One advantage is the tax-free compounding of earnings on the investment inside the IRA, which has a powerful multiplying effect on the investment account. This accumulation becomes greater when the savings begin during childhood. When tax-free deposits or tax-free accumulations have more than 50 years to compound, a modest savings plan can produce substantial wealth. There is no minimum age to establish an IRA, and in the case of a Roth IRA, there is no maximum age to establish the account. Finding providers willing to establish a kid IRA takes some effort, however. Some providers will not establish a kid IRA or will establish one only under very restrictive conditions—due to liability concerns rather than tax restrictions.

Another positive aspect of a kid IRA is the flexibility provided for depositing funds in this type of IRA. When a child earns money, the physical dollars are not required to be deposited; a parent may provide the funds to establish the IRA, limited to the actual earnings of the minor in a particular year.

The money and control of asset selection in an IRA belongs to the individual; the child owns his or her IRA. The child may choose to withdraw the investment, although the minor may need to wait until the age of majority to do so.

FINANCIAL MOTIVATION

By teaching children to invest as soon as income is earned, parents can help their children see the financial implications as IRA deposits accumulate over time. Examples shown in Table 1, Panel A, should provide encouragement to start an investing program. Table 1, Panel A illustrates the outcome of investing a single investment of $4,000, given the 2007 limit (CUNA Mutual Group Service, 2008), while Table 1, Panel B, shows the financial effect of the initial $4,000 investment with $4,000 additional investment on each subsequent birthday.

Using Ibbotson's historical rates of return (Ibbotson, 2000) and an investment horizon of 50 years, this $4,000 is expected to grow to $1,510,008 (see "Small Company Stocks" in Table 1, Panel A). With additional yearly deposits of $4,000, the results are much more dramatic yielding $13,462,461 (see "Small Company Stocks" in Table 1, Panel B). If early investments of $4,000 are unrealistic for a young child or teenager, subsequent investments of $4,000 in later years will still have a great impact on the accumulated earnings. The goal should be to develop early habits of saving to secure financial independence.

A child typically pays little or no taxes so the tax deductibility of a deposit to a traditional IRA represents very little benefit. Yet, the impact of this deposit is even greater if the investment is sheltered in a Roth IRA, since the deposit is made after-tax but the distributions are received tax-free.

SURVEY DESIGN

Mutual fund families in this study were identified in the annual list of "The Best Fund Families" (Norton, 2000), compiled by Barron's/Lipper. To qualify for the Barron's/Lipper rankings, a fund family had to offer investors a full range of options. The term "full range" for this article meant (1) one or more money-market funds, (2) at least three U.S. stock funds, (3) at least one foreign-stock portfolio, and (4) one balanced or asset-allocation fund that invest in both bonds and stocks. Additionally, the fund families had to offer at least two taxable-bond funds and at least one municipal-bond fund.

This list of fund families represents an ideal population to survey due to the breadth and depth of management, experience, and fund offerings. Barron's provides national exposure for the

fund families, including high-profile free advertising for the fund family. In addition, Barron's facilitates easy access to fund families by potential investors.

In total, 92 mutual fund families were identified with Total Net Assets of $3.525 trillion under management. At the time of this study, fund families ranged in size from $612.0 million to $602,388.8 million. Accordingly, 92 fund families qualified for the one-year rankings—up from 89 companies in the prior year. These funds and their rankings are indicated below, in Table 2.

Table 1: Financial Implications of Investment

Panel A: Single $4000 Investment on Starting Age Birthday, with no additional investment.

Terminal value of Account at Age 65 (Traditional or ROTH IRA)

			Rate of Return for Investment Period				
Starting Age	Ending Age	Investment Period (in years	Inflation	US Treasury Bills	Long-term Corporate Bonds	Large Company Stocks	Small Company Stocks
			3.10%	3.80%	5.60%	11.30%	12.60%
15	65	50	$18,407	$25,818	$60,990	$844,925	$1,510,009
25	65	40	13,565	17,781	35,369	289,645	460,888
35	65	30	9,996	12,246	20,511	99,292	140,673
45	65	20	7,366	8,433	11,894	34,038	42,937
55	65	10	5,428	5,808	6,898	11,668	13,105

Panel B: Initial Investment of $4,000 on Starting Birthday Age with $4,000 additional investment on each birthday.

Terminal value of Account at Age 65 (Traditional or ROTH IRA)

			Rate of Return for Investment Period				
Starting Age	Ending Age	Investment Period (in years)	Inflation	US Treasury Bills	Long-term Corporate Bonds	Large Company Stocks	Small Company Stocks
			3.10%	3.80%	5.60%	11.30%	12.60%
15	65	50	$483,163	$599,984	$1,078,661	$8,286,740	$13,462,461
25	65	40	322,100	380,437	595,520	2,817,480	4,086,985
35	65	30	203,411	229,235	315,342	942,586	1,225,382
45	65	20	115,948	125,104	152,864	299,860	351,957
55	65	10	51,495	53,389	58,641	79,530	85,369

To obtain corporate policy information regarding children and IRAs, the researchers conducted a telephone survey. The questions asked were specifically about a 15-year-old minor, but the responses extended to a child under 18 or the age of majority in a particular state. Each mutual fund representative was asked the following three open-ended questions regarding the opening of new accounts:

- Do you offer IRA accounts?
- Can a 15-year-old open an IRA account?
- Does the IRA account require an adult guardian or custodian signature?

The researchers conducted a pilot test of the telephone survey with five of the larger fund families to better formulate questions for the entire list of fund families. These five fund families were included in the final population. The survey was conducted during November 2000, using telephone numbers obtained from the Barron's article. Licensed mutual fund representatives at call centers in the U.S. were queried in this study.

Some representatives in the study modified their initial responses to the survey questions after either asking a supervisor or referring to a policy manual. The respondents indicated that the issue of kid IRAs is infrequently raised and few fund representatives had a scripted response to the survey questions.

Table 2: The Best Fund Families

THE BEST FUND FAMILIES
Survey Results: IRAs for Children
1 = Yes; 0 = No

Fund Family	Total Net	IRA	IRA		Accept Child	Custodiam/ Guardian	Brokered Only
			Tra	Rot			
AAL Capital Mgmt	7,089.2	1	1	1	1	1	0
ABN AMRO	1,023.0	1	1	0	1	1	0
AIM Advisors (1)	102,733.8	1	1	1	0	0	0
Alliance Capital (13)	43,424.0	1	1	1	1	1	0
American Assoc of Retired Persons	16,465.3	1	1	1	1	1	0
American Century (6)	93,295.3	1	1	1	1	0	0
American Funds Dist	324,951.3	1	1	1	1	1	0
Atlas Advisers	1,069.2	1	1	1	1	1	0
Banc One investment	31,596.4	1	1	1	1	1	0
Bank of America Advisors	18,005,5	1	1	1	1	1	0
Bankers Trust	9,988.2	1	1	1	1	1	0
Calvert/Acacia	2,386.3	1	1	1	1	1	0
Charles Schwab	20,663.4	1	1	1	1	1	0
Chase Manhattan	11,310.6	1	1	1	1	0	0
Citibank	1,508.5	1	1	1	1	1	0
Colonial Mgmt	13,374.8	1	1	1	0	0	0

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Fund Family	Total Net	IRA	IRA		Accept Child	Custodiam/ Guardian	Brokered Only
			Tra	Rot			
Credit Suisse	8,589.6	1	1	1	1	1	0
Davis Selected Advisers	20,969.7	1	1	1	1	0	0
Delaware Mgmt	13,116.9	1	1	1	1	1	0
Dreyfus	38,493.6	1	1	1	0	0	0
Eaton Vance Mgmt	13,251.2	1	1	1	0	0	0
Enterprise Capital	4,111.7	1	1	1	1	1	0
Evergreen (11)	32,523.3	1	1	1	1	1	0
Federated Investors (17)	32,149.9	1	1	1	1	0	0
Fidelity (10)	602,838.8	1	1	1	0	0	0
Fifth Third Bank	2,662.7	1	1	1	1	1	0
First Investors	3,842.9	1	1	1	0	0	0
Firstar	5,989.3	1	1	1	0	0	0
Fleet Investment Advisers	8,075.3	1	1	1	1	1	0
Fortis Advisers	3,424.8	1	1	1	0	0	0
Frankfin/Templeton (20)	129,923.8	1	1	1	1	1	0
General ElecIGNA Capital	15,231.0	1	1	1	1	1	0
Goldman Sachs	15,573.2	1	1	1	1	1	0
Guardian	4,748.6	1	1	1	1	1	0
Harris Trust & Svgs Bank	3,265.9	1	1	1	1	0	0
IDS Mutual (3)	91,659.9	1	1	1	0	0	0
Invesco Funds (7)	18,755.1	1	1	1	1	0	
J Hancock	15,166.1	1	1	1	0	0	0
J.P. Morgan	9,588.8	1	1	0	1	0	0
Janus Capital	163,816.5	1	1	1	1	1	0
Jones & Babson	1,856.6	1	1	1	1	1	0
Kemper Funds	29,311.7	1	1	1	0	0	0
Key Asset Management	5,311.9	1	1	1	1	0	0
Legg Mason/West	20,543.9	1	1	1	1	0	0
Lord Abbett	21,030.0	1	1	1	1	1	0
Mainstay Funds	19,607.6	1	1	1	1	1	0
Manufacturers SEC	835.8	1	1	1	0	0	0

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Survey Results: IRAs for Children
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Fund Family	Total Net	IRA	IRA		Accept Child	Custodiam/ Guardian	Brokered Only
			Tra	Rot			
Mentor Investment	3,089.7	1	1	1	1	0	0
Merrill Lynch (16)	64,281.9	1	1	1	1	1	0
MFS Investment (9)	85,595.4	1	1	1	1	0	0
Mississippi Valley	1,950.4	1	1	1	1	0	0
Morg Stanley Dean Witter	9,791.2	1	1	1	1	0	0
Morgan Stanley Dean Witter Adv	62,176.6	1	1	1	1	1	0
Munder Capital	5,135.7	1	1	1	0	0	0
National Qty Bank	8,283.8	1	1	1	1	1	0
Nationwide Advisory	4,216.2	1	1	1	1	0	0
New England Securities	7,088.9	1	1	1	0	0	0
Northern Trust	10,099.3	1	1	1	1	1	0
Norwest Investment	12,766.8	1	1	1	0	0	0
Nuveen Advisory	6,281.0	1	1	1	1	1	0
OppenheimerfundslCentennial (8)	72,445.0	1	1	1	1	1	0
Paine Webber/Mitchell Hutchins	10,160.3	1	1	1	1	1	0
Payden & Rygel	1,865.4	1	1	1	1	1	0
Phoenix Investment Partners (2)	13,489.2	1	1	1	0	0	0
Pimco Advisors	53,032.9	1	1	1	0	0	0
Pioneering Mgmt	21,854.9	1	1	1	0	0	0
Principal Mgmt (22)	3,684.0	1	1	1	1	1	0
Prudential (15)	32,140.6	1	1	1	1	0	0
Putnam Investment (5)	225,813.8	1	1	1	0	0	0
Safeco Asset Mgmt	4,145.8	1	1	1	1	1	0
Salomon Bros	2,569.2	1	1	1	_1	0	0
Scudder Funds (14)	27,604,7	1	1	1	1	0	0
Security Management	1,678.0	1	1	1	1	1	0
SEIl Group	22,289.6	1	1	1	1	1	1
Seligman J& W	7,405.5	1	1	1	1	0	0
Sentinel Advisors	2,860.0	1	1	1	1	0	0
Sit Investment	1,780.2	1	1	1	1	1	0
SSBC Fund Mgmt (12)	50,352.9	1	1	1	1	1	0
State Street Research	8,984.4	1	1	1	1	1	0
Stein Roe & Famham	7,771.3	1	1	1	1	1	0
STI Capital Management	9,097.3	1	1	1	0	0	0

Table 2: The Best Fund Families

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Survey Results: IRAs for Children
1 = Yes; 0 = No

Fund Family	Total Net	IRA	IRA		Accept Child	Custodiam/ Guardian	Brokered Only
			Tra	Rot			
Strong Capital	23,202.9	1	1	1	1	1	0
Sunamerica	4,486.4	1	1	1	1	1	0
T. Rowe Price Associates (21)	92,849.7	1	1	1	1	1	0
US Bank	11,383.5	1	1	1	1	1	0
USAA Investment	20,833.6	1	1	1	1	1	0
Van Kampen	43,538.1	1	1	1	1	1	0
Vanguard (18)	460,103.8	1	1	1	1	1	0
Variable Annuity Life Ins	612.0	1	1	1	0	0	0
Waddell & Reed (4)	23,474.0	1	1	1	1	0	0
Washington Mutual	6,764.9	1	1	1	1	1	0
WeIls Fargo	4,213.8	1	1	1	1	1	0
DON'T OPEN IRAS FOR CHILD	-	21	21	21	21	NIA	NIA
DO Open IRAs for Children	2,338,581	71	71	69	71	51	1
TOTALS -		92	92	90	92	51	1

SUMMARY OF FINDINGS

The interaction of mutual fund families with minors can be categorized into three distinct categories:

- 21 of the 92 fund families have policies of not allowing investment by minors in IRA accounts;
- 51 of the 92 fund families allow minors to open IRA accounts with a custodian or guardian;
- 20 of the 92 fund families were willing to open IRA accounts without a custodian or guardian at the time of this study.

Table 3: Survey Results for a Sample of Barron's 92 Best Fund Families			
	Total Net Assets under Management as of 12/31/99 ($ millions)	Form of IRA	
		Traditional	Roth
Do NOT Open IRAs for Children (percent)	$1,269,814 (35.19%)	21	21
Do Open IRAs for Children WITH a Custodian or Guardian's Signature (percent)	$1,679,826 (46.55%)	51	50
Do Open IRAs for Children WITHOUT a Custodian or Guardian's Signature (percent)	$658,755 (18.26%)	20	19
TOTALS	$3,608,395	92	90

IRS REGULATION ON IRAS AND KID IRAS

Rulings relevant to IRS regulations of Roth IRAs are useful at this point. To make the rulings more understandable, Benefits Link explains these regulations in dialogue format, as shown below; the relevant sections of Treasury Decision 8816 (February 3, 1999) applicable to kid IRAs are indicated below.

Table 4. Section 1.408A-3 Contributions to Roth IRAs	
The section sets forth the following questions and answers that provide rules regarding contributions to Roth IRAs:	
Q-I.	What types of contributions are permitted to be made to a Roth IRA?
A-I.	There are two types of contributions that are permitted to be made to a Roth IRA: regular contributions and qualified rollover contributions (including conversion contributions). The term regular contributions means contributions other than qualified rollover contributions.
Q-3	.What is the maximum aggregate amount of regular contributions an individual is eligible to contribute to a Roth IRA for a taxable year?
A-3.(a).	The maximum aggregate amount that an individual is eligible to contribute to all his or her Roth IRAs as a regular contribution for a taxable year is the same as the maximum for traditional IRAs: $2,000 or, if less, that individual's compensation for the year
Q-4	How is compensation defined for purposes of the Roth IRA contribution limit?

Table 4. Section 1.408A-3 Contributions to Roth IRAs	
The section sets forth the following questions and answers that provide rules regarding contributions to Roth IRAs:	
A-4.	For purposes of the contribution limit described in A.3 of this section, an individual's compensation is the same as that used to determine the maximum contribution an individual can make to a traditional IRA. This amount is defined in section 219(0(1) to include wages, commissions, professional fees, tips, and other amounts received for personal services, as well as taxable alimony and separate maintenance payments received under a decree of' divorce or separate maintenance. Compensation also includes earned income as defined in section 401(c)(2), but does not include any amount received as a pension or annuity or as deferred compensation. In addition, under section 219(c), a married individual tiling a joint return is permitted to make an IRA contribution by treating his or her spouse's higher compensation as his or her own, but only to the extent that the spouse's compensation is not being used for purposes of the spouse making a contribution to a Roth IRA or a deductible contribution to a traditional IRA.
General Provisions and Establishment of Roth IRAs	
Commentators asked for clarification regarding whether a Roth IRA may be established for the benefit of a minor child or anyone else who lacks the legal capacity to act on his or her own behalf. On this point, the IRS and Treasury intend that the rules for traditional RAs also apply to Roth IRAs. Thus, for example, a parent or guardian of a minor child may establish a Roth IRA on behalf of the minor child. However, in the case of any contribution to a Roth IRA established for a minor child. the compensation of the child for the taxable year for which the contribution is made must satisfy the compensation requirements of section 408A(c) and section	

It is also important to note that the surveyed fund families utilize an IRA Adoption Agreement, requesting specific information from the person opening an account. The following block of information was taken from the Vanguard Group application at the time of this study.

- Type of IRA
  - Traditional IRA
  - Roth IRA
- IRA Registration
  - Social Security Number
  - Birth Date
  - Name, Address, Phone Numbers
- Traditional IRA/Roth IRA Instructions
  - By Asset Transfer from an Existing IRA
  - By Check
  - Investment Fund Specification
- Beneficiary Designation
  - Primary Beneficiaries
  - Secondary Beneficiaries

- Shareholder Signature
  - Signature of Applicant
  - If IRA owner is minor, a legal guardian or custodian must sign.
  - Date

INDIVIDUAL (FAMILY) ISSUES REGARDING KID IRAS

The major issue in establishing an IRA, after finding a fund family willing to establish an account for a minor, is the earned income requirement. According to the Tax Guide for Investors (Thomas, 2000), earned income has to be compensation income—as opposed to investment income. In addition, the earned income must be taxable compensation; income covered by the foreign earned income exclusion does not qualify. The minor is not required to pay taxes on the income if he or she earned less than the minimum taxable income required for the particular year.

Three categories of compensation income for a minor are

(1) Amounts earned as an employee (W-2 income)
(2) Income from a parent's business
(3) Income attributed to work performed for others or to household chores.

Income recorded on a W-2 is the most recognizable source of earned income and minimizes problems with documentation to support contributions to an IRA.

Bodnar (2008) emphasizes that, "a child can have a Roth IRA as long as he or she has earned income from a job. Birthday gifts from grandparents or interest on a savings account don't count, nor does an allowance for doing general household chores. But earnings from a job such as mowing lawns or baby-sitting qualify." Bodnar stresses that the best way to handle this type of income is to keep careful records of each job, including when it was done, for whom, and how much was paid.

The parent should file an income tax return for the minor to provide a record of the compensation; proof of the work should be stored with the tax return. If the IRS audits the return, the "proof" of the earned income will be required. Paying the child by using a check facilitates the recordkeeping process. A minor's IRA entails more recordkeeping and tax return filings by the parent or guardian, but the financial benefits are obvious and worth the recordkeeping time and effort.

CONCLUSIONS

Several conclusions can be drawn from this study. First, the results show that the majority of fund families (71 of the 92 fund families or 77 percent), representing 65 percent of the money under management, are willing to establish accounts for minors. Of these 71 families, 51 require

the signature of a custodian or guardian while 20 allow minors to open accounts without the signature of a custodian or guardian.

During the interviews, we noted that the reason for a fund family's refusal to open a kid IRA tended to be related to the policy problems associated with contracting with minors. Indirectly, the survey suggests that 71 fund families have resolved this issue—at the time of this study.

Responsible money management habits can be started early in a child's life under the supervision and with the encouragement of parents. By taking advantage of the kid IRA and attendant compounding investment results, a minor's habit of saving over long time periods can generate enormous financial impact.

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INFLUENCES OF SELECTED MACROECONOMIC VARIABLES ON U.S. STOCK MARKET RETURNS AND THEIR PREDICTABILITY OVER VARYING TIME HORIZONS

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ABSTRACT

This paper investigates the changing explanatory power of selected macroeconomic variables over aggregate stock returns as the timeframe changes from over-the-month to over-the -year. Using the same set of monthly observations from January 1970 to December 2004, we found that the explanatory power changes dramatically from less than 1 percent of variance in stock returns calculated on monthly basis to more than 84 percent of variance when point-to-point change is measured over one-year period. This finding is consistent with previous research [Fama (1981, 1990); Kaul (1957);Shah (1989); and Barro(1990)]. Further, the results from our study also provide an alternative to using high frequency data as in Flannery and Protopapadakis (2002) in order to improve explanatory power. Quite interestingly, it is also observed that lagged growth rate in industrial production (a proxy of overall economic activity) and rate of inflation contribute significantly to the explanatory power apart from own lagged value of stock returns, while the contributions of change in broad monetary aggregate and federal funds rate are negligible. An investigation of possible structural breaks or shifts during different time periods confirms that a significant shift in the slope seems to have occurred in 1992. Surprisingly, the oil shock period of 1979/80 and the tragedy of September 11, 2001 do not seem to have induced any significant structural changes in the relationships among the macroeconomic variables studied in this paper. Finally, the forecasting power of the model using only the lagged values of the regressors and the sample period of January 1970 to December 2003 to make unconditional out-of-sample forecast for the twelve months of 2004 has been tested. All tests show quite significant out-of-sample forecasting power of the model used.

INTRODUCTION

Numerous studies have been documented during last two decades in the empirical literature of financial economics that investigated the predictability of stock returns by lagged regressors. The regressors include financial, macroeconomic and demographic variables. The empirical knowledge regarding the predictability of stock returns has been subjected to continual updating over time mainly driven by new econometric methods. But little consensus regarding the set of appropriate regressors has emerged [e.g., Mankiw and Shapiro (1986), Nelson and Kim (1993), Goetzman and Jorion (1993), Cavanagh, Elliot & Stock, (1995), Stambaugh (1999), Lanne(2002), Lewellen (2003), Campbell and Yogo (2003), Janson and Moreira (2004), and Polk et al. (2004)]. The recent studies that examined the effects of demographic changes on stock market return include, e.g., Donaldson and Maddaloni (2002), Campbell et al. (2001), Goyal (2004), and Ang and Maddaloni (2005).

Efficient Market Hypothesis (EMH) rooted in the pioneering work of Gibson (1889) made academicians believe for many years that stock prices follow random walk. According to the EMH, the best prediction of the next period's stock price is today's price plus a drift term implying that stock returns are not predictable. Attempts to verify the validity of this assertion sparked enormous interest in studying stock market returns predictability. There is growing evidence that stock market returns are predictable to some degree. The literature documents predictability of stock index returns from lagged returns, lagged financial and macroeconomic variables, and calender or event dummies. However, stock return predictability does not necessarily mean that markets are not reasonably efficient since time-varying expected returns due to changing business conditions and risks can be partly predictable even when the EMH holds. Evidence of stock index returns predictability implies that markets can be beaten by using the above variables. According to Cutler, Poterba, and Summers (1990), "The Efficient Market Hypothesis was probably the right place for serious research on asset valuation to begin, but it may be the wrong place for it to end".

Sudden increases or decreases in wealth result in large stock price movements. Traditional financial theory suggests that such movements are caused by macroeconomic fundamentals. But empirical attempts to link large stock movements to macroeconomic news have been only marginally successful. Chen, Roll, and Ross (1986) consider the weak link a "rather embarrassing gap".

The familiar Gordon (1962) growth model is extensively applied to determine expected stock price that used future dividend stream discount rate and dividend growth rate as explanatory variables. These variables, in turn, are influenced by macroeconomic performance and policy-induced changes in market environment. In general, expected changes in economic environment influence future cash flows and the rate of discount that determine the present value of a firm. Intuitively, macroeconomic variables or state -of-the economy variables are presumed to influence stock returns. At the same time, there is no consensus on the appropriate set of macroeconomic variables that would largely and more precisely explain and predict stock market returns. The theory

is silent in this regard leaving the selection of appropriate macroeconomic variables to researchers' judgment and experimentations.

Numerous prior empirical studies investigated the causal linkages between stock market returns and a host of macroeconomic variables that included GDP growth, industrial production rate, short-term interest rate, inflation rate, interest rate spread, changes in monetary aggregates, among others. Stock market returns are usually directly tied with the business cycle, while financial variables (e.g., dividend growth, discount rate, and cash flows) produce perverse effects on stock prices.

In addition to the stock market and macroeconomy linkage empirics, there is a growing amount of empirical literature on time series return predictability which can be divided into three categories: i) return predictability using historical prices or returns investigates whether today's return is related to historical returns at various frequencies; ii) return predictability using lagged financial and macroeconomic variables, and iii) return predictability using calendar dummies for seasonality.

The studies in category (i) include [e.g., Fama and French (1988), Petorba and Summers (1988), Lo and MacKinlay (1997), Lo, Mamaysky and Wang (2000)]. The studies in category (ii) include [e.g., Fama and French (1988), Breen, Glosten and Jagannathan (1989), Harvey (1991), Solnik (1993), Pesaran and Timmermann (1995, 2000)]. The studies in category (iii) include [e.g., Keim (1989), Hawanini and Keim (1995), French (1980), Keim and Stambaugh (1984), Chang, Pinegar and Ravichandran (1998), Ariel (1990)].

Notwithstanding the large number of empirical studies on stock returns, it appears that the studies that focus on the explanatory power of macroeconomic variables with regard to U.S. stock market returns and their predictability on varying time horizons are scant. This paper seeks to fill in this void by investigating the above using monthly data from January 1970 to December 2003 within the VAR (Vector Autoregressive) framework.

LITERATURE REVIEW

Fama (1981) and Kaul (1987) found a puzzling result that real activity explains larger fractions of return variation for longer return horizons. Fama (1990) explains this by arguing that regressions of shorter-horizon returns on production growth rates understate explanatory power because information about the production of a given period spreads over preceding periods. But the number of observations in Fama (1990) varies from 420 in monthly regressions to only 140 in quarterly and 137 in annual. This is equivalent to using two sets of data. In the present study, we examine such impact using the same set of data and number of observations (except for a very small change due to end point adjustments). Similarly, Gesky and Roll (1983), Barro (1990), and Shah (1989) find that larger fractions (often exceeding 50 %) of annual stock-return variables can be traced to forecasts of variables such as real GNP, industrial production, and investment. Apart from these studies, the other studies cited below explore various other aspects of the relationship between

stock returns and macroeconomic variables. Chen et al. (1986) examined equity returns relative to a set of macroeconomic variables and found that the set of macroeconomic variables which can significantly explain sock returns includes growth in industrial production, changes in the risk premium, twists in the yield curve, measures of unanticipated inflation and changes in expected inflation during periods of volatile inflation. More recent examples of studies involving a number of macroeconomic variables include Chen (1991), Peseran and Timmermann (1995), and Flanery and Protopapadakis (2002).

The empirical literature in which aggregate output is related to stock returns includes Cutler, et al. (1989), Balvers, et al. (1990), Marathe and Shanky(1994). Examples of studies relating inflation to stock returns are Bodis (1976), Jaff and Mandelker (1976), Nelson (1976), Fama and Schwert (1977), Geske and Roll (1983), DeFine (1991), Boudoukh and Richardson (1993), Bealduzzi (1995), Grahman (1996), Siklos and Kwok (1991), and Adams , et al. (2004). Studies relating money supply to stock returns include Hamburger and Kochin (1972), Pesando (1974), Ragalski and Vinso (1977). Examples of studies relating stock returns to interest rate /term spread variables include Campbell (1987), Fama and French (1989), Hodrick (1992), Jensen and Johnson (1995) and Ang and Bekaert (2001). Examples of studies done outside US are Darrat and Mukherjee (1987), Darrat (1990), Poon and Taylor (1991), Mukherjee and Naka (1995), Brown and Otsuki (1990), Gjerde and Saettem (1999), Naka, et al. (1999), Pethe and Karnik (2000), Mayasami and Koh (2000), and Panda and Kamaiah (2001). Examples of studies involving many countries are Gultekin (1983), Solnick (1984), Mandelker and Tandon (1985), Mookerjee (1989), Wasserfallen (1989), Jeng , et al. (1990), Ferson andHarvey (1993), Lin (1993), Kaneko and Lee (1995), Ely and Robinson (1997), Conover, et al. (1990), and Durham (2001).

In contrast, there have been numerous studies showing reverse causality running from stock returns towards macroeconomic variables. Nevertheless, as remarked by Chen, et al., (1986),"… Stock prices are usually considered as responding to external forces (even though they may have a feedback on the other variables)". The present study too assumes unidirectional causality from macroeconomics variables towards stock returns because most theoretical models involving macroeconomic variables rarely include stock prices (or stock returns) in their argument as a significant determinant. Therefore, this literature survey excludes the studies investigating the reverse causality. It should be noted, however, that some of the studies mentioned above treat all variables as endogenous in their application of estimating techniques such as VAR models.

Some studies also find that the predictive ability of certain macroeconomic variables with respect to stock returns is quite uneven over time, e.g., Durham (2001). On the other hand, there is no dearth of studies, which fail to support the ability of macro variables to predict stock returns. Chen , et al. (1998) concludes, " The macroeconomic factors generally make a poor showing. Put more bluntly, in most cases, they are as useful as a randomly generated series of numbers in picking up return covariation. We are at loss to explain this poor performance." Flannery and Protopapadakis (2002) argue that tests based on monthly data may have lower power because the impact of macroeconomic variables on monthly stock returns may be obscured by other events occurring

during the month. Therefore, they apply high frequency data (daily returns) to minimize such impacts of other omitted variables. Moreover, they evaluate the impact on stock price volatility instead of realized returns with respect to real variables.

SELECTION OF MACROECONOMIC VARIABLES IN THE PRESENT STUDY

Stock market is assumed endogenous relative to other markets in line with Chen, et al. (1986). The S & P 500 Index is selected as a proxy for the aggregate stock market and percentage changes are used to represent stock market returns. Four macroeconomic variables are selected as likely explanatory variables following the simple and intuitive financial theory as suggested by Chen, et al. (1986). As a proxy for overall economic activity, Total Industrial Production (IP) Index (seasonally adjusted) with base year 1997 instead of GNP or GDP is selected because of availability of monthly data. As argued by Chen, et al. (1986), "Insofar as the risk premium measure does not capture industrial production uncertainty; innovations in the rate of productive activity should have an influence on stock returns through their impact on cash flows." Many empirical studies, cited above, have found positive relation between contemporaneous stock returns and industrial activity, while some other studies have found positive contribution of lagged changes in industrial production.

The Consumer Price Index (CPI) and percentage change therein is used to measure inflation. The rate of inflation is a likely determinant of stock returns due to the systematic effect of unanticipated price-level changes as well as impact on asset valuation caused by relative price change associated with inflation as argued by Chen, et al. (1986). Actual inflation can be expected to be positively related to unanticipated inflation and thus have negative impact on asset prices and returns. On the other hand, inflation may have positive impact on cash flows to dampen some or all of this negative impact. Some authors argue, however, that such impact on revenues and cost will not be large , because of pre-existing contracts (for example, DeFina; 1991). Similarly, money supply growth may have important direct effects through portfolio changes and indirect effects through their effect on real economic activity as well as on rate of inflation. While the positive correlation of money supply growth with inflation might suggest negative influence on stock returns, the stimulus provided to overall economic activity might lead to positive impact. The net effect is thus an empirical question.

Finally, rate of interest is supposed to influence stock prices mainly through its impact on the expected rate of discount for future cash flows. Strong positive correlation of interest rate with the discount rate suggests that surges in interest rate will have negative effect on stock returns. Federal Funds Rate (FF) has been selected in this paper to proxy short term interest rate. However, selection of these four macroeconomic variables is not exhaustive by any means.

EMPIRICAL METHODOLOGY

The theoretical model in general functional form is as follows:

$$Y = f(\underset{+}{X}, \underset{-}{Z}, \underset{-}{V}, \underset{?}{L}) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(1)$$

where, Y = rate of return on S& P 500, X = percentage change in U.S. industrial production index, Z = inflation rate (percentage change in consumer price index), V = federal funds rate and L = Percentage change in U.S. broad money supply. The expected sign on the top of each explanatory variable is already mentioned in the preceding section. Causality is investigated using Granger's procedure. Causality in the Granger sense implied that for a variable x to cause another variable Y, X must precede Y. The Granger-causality equation can thus be formulated in levels as follows:

$$Y_t = \beta_0 + \sum_{i=1}^{M} \beta_i Y_{t-i} + \sum_{j=1}^{K} \beta_j X_{t-j} + \varepsilon_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(2)$$

Akaike's information criterion (AIC) is used to obtain the appropriate lag length for all variables. This paper follows the method outlined by Hsio (1981). The Granger causality test uses an F-test to determine whether lagged information on variable X gives statistically significant information about a variable Y in the presence of lagged values of Y. If the F-test fails to provide such evidence, it is then concluded that the variable X does not cause the variable Y. The null hypothesis that X does not causes Y is rejected when the test statistic F is greater than the critical value at the most commonly used 5 percent level of significance.

Contemporaneous values of regressors have not been used considering the reporting delays or lags in the release of information and the lags in the incorporation of information about them into prices. In addition to the consideration of lags in information and the lags in the incorporation of information about them into prices, the lagged value of the endogenous variable indicates autoregressive process. An additional benefit of using only lagged values of explanatory variables is that it enables us to make unconditional or ex post forecasts for stock returns (Pindyck and Rubindeld, 1990). Three versions of the basic regression model have been used. First, all monthly rates of change are measured relative to the value in the previous month. Second, quarterly rates of change are measured relative to the value in the preceding quarter. Third, annual rates of change are measured relative to the value in the same month of the preceding year. Thus, the three versions differ only in the methods of calculations of rates of change but use the same set of monthly data for 35 years spanning from January 1970 through December 2004. [The relevant data are available from www. economagic.com]

To examine the time series property of each variable, the well-known augmented Dickey-Fuller (ADF) test for unit root (nonstationaity) against its alternative of stationarity around a fixed time trend is applied. The ADF statistics are generated by estimating the following equation:

$$\Delta X_t = \rho_0 + \rho_1 X_{t-1} + \rho_2 T + \sum_{i=1}^{n} \Phi_i \Delta X_{t-i} + U_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3)$$

where, T is a time trend.

The ADF test is implemented to avoid the so-called" spurious regression" problem (Granger and Newbold, 1974, Dickey and Fuller, 1979 and 1981).

To forecast out-of-sample for the next 12 months of 2004, the estimates of equation (2) with data for January 1970 through December 2003 are used. The forecasting accuracy is tested by Theil's inequality coefficient and the decomposition into bias, variance and covariance proportions (Maddala, 1977). The plots of actual and predicted values of stock returns are also graphically presented to display out-of-sample prediction accuracy. All estimations are done by EVIEWS.

EMPIRICAL RESULTS AND ANALYSES

To study the nature of the distributions of each variable for monthly, quarterly and annual data, the numeric of mean, median, standard deviation, skewness and kurtosis are reported in Appendix -I panels A, B, and C, respectively. A cursory inspection of the results shows that the respective means and medians are within close proximity. The standard deviation of S& P 500 returns is consistently much higher than that of any other variable and the data distribution of this variable is uniformly skewed to the left. The distributions of X are also skewed to the left excepting monthly data. The distribution of V (federal funds rate) is skewed to the left only for monthly data. Distributions of Z (inflation rate) and L (growth in board money supply) are consistently skewed to the right for monthly, quarterly and annual data. In most cases, there is evidence of excess kurtosis.

Next, the simple correlation coefficients are reported in Appendix-II using monthly, quarterly and annual data ordered in panels A, B and C, respectively to determine the presence and the extent of multicollinearity between explanatory variables. The general conclusion emerges that the pair-wise correlation coefficients are mild to moderate (above 0.5) posing no serious multicollinearity problems to generate inefficient parametric estimates. Moreover, the presence of mild to moderate multicollinearity is not necessarily bad since another important objective of this paper is out-of-sample forecasting.

To ascertain the time series property of each variable, the ADF unit root test results are reported in Table1.

Table 1 depicts stationarity of each variable for monthly and quarterly data uniformly at 5 percent and higher levels of significance. The same also applies to annual data for each variable with

the exception of the growth in U.S. broad money supply. However, this variable has not been retained in the final analysis because of its low statistical significance.

Table 1: ADF Statistic for Unit Root

Variables	ADF-Statistic[1] (Monthly data)	ADF-Statistic[2] (Quarterly data)	ADF-Statistic[3] (Yearly data)
Y	-20.20626	-4.920376	-3.859466
X	-9.497868	-5.273363	-3.417938
Z	-3.712944	-3.437696	-3.134817
V	-13.60964	-4.288197	-3.794280
L	-10.63056	-3.560017	-1.510097

Where, 1 for ADF critical values of monthly data are -3.445814, -2.868252 and -2.570410 at 1,5 and 10 percent levels of significance, respectively; 2 for ADF critical values of quarterly data are -3.446122, -2.868387 and -2.570483 at 1,5 and 10 percent levels of significance, respectively and 3 for ADF critical values of annual data are -3.446692, -2.868638 and -2.570617 at 1,5, and 10 percent levels of significance, respectively.

Equation (1) is estimated with lagged -values of all four explanatory variables with monthly, quarterly and annual data. The comparative results are reported in Table 2.

Table 2: Regression Results* (All variables included)

Variables	Coefficients (Monthly data)	Coefficient (Quarterly data)	Coefficients (Yearly data)
Intercept	1.2294	1.4197	2.0801
	(2.5402)	(1.9752)	(2.0402)
Y(-1)	-0.0155	0.6486	0.9164
	(-0.3085)	(17.1507)	(44.3036)
X(-1)	0.0049	-0.1339	-0.1761
	(0.0153)	(-0.6732)	(-1.5529)
Z(-1)	-1.0621	-0.1984	-0.0608
	(-1.4920)	(-0.5354)	(-0.3999)
V(-1)	-0.5867	-0.0413	-0.2175
	(-1.5999)	(-1.9068)	(-1.0371)
L(-1)	-0.1663	-0.1769	-0.0795
	(-0.2860)	(-0.6000)	(-0.7141)
	$\overline{R}^2$=0.0012	$\overline{R}^2$=0.4520	$\overline{R}^2$=0.8429
	DW=2.0085	DW=1.6756	DW=2.0014
	F=1.1029	F=69.4655	F=436.5051
	AIC=5.8429	AIC=6.3454	AIC= 6.6055

* The associated t-value is reported in parenthesis underneath each coefficient.

Table 2 shows dramatic improvements in the explanatory power and the overall statistical significance of the model in terms of $\overline{R}^2$'s and the F-statistics as the frequency of data switches from monthly to quarterly and then from quarterly to annual. The appropriate lag length is 1 (one) as determined by the AIC criterion. Other higher order lagged values do not have statistically significant coefficients. As a result, they have not been reported here.

The coefficients of V(-1) and L (-1) are statistically highly insignificant, although they have the expected negative sign. The redundancy test also shows that these two variables have no discernible influences on stock returns and they do not contribute to the explanatory power of the model in terms of $\overline{R}^2$ and its overall statistical significance in terns of F-statistic. The F-statistic for redundancy test is 0.5823 with p-value of 0.5591 and the log-likelihood ratio is 1.1803 with p-value of 0.5543. Consequently, the model has been re-estimated only with annual data with exclusions of the lagged redundant variables (V and L). The estimates are presented in Table 3.

Table 3. Regression Results (Yearly Data) (Excluding V and L)

Variables	Coefficients	t-statistic
Intercept	2.3160	3.0412
Y(-1)	0.9178	44.8254
X(-1)	-0.2659	-3.5473
Z(-1)	-0.1712	-1.5239
$\overline{R}^2$ = 0.8432, DW = 1.9963, F=728.6307, AIC = 6.5986		

As observed in Table 3, virtually there are no changes in the numerics of $\overline{R}^2$ and DW statistic, but the F-statistic improves significantly from 436.5051 to 728.6307. All the coefficients have the expected sign excepting industrial production rate. Again, the appropriate lag length is determined by the AIC criterion.

The sign of the coefficient of Y (-1) in Table 3 shows positive autoregressive process and its value is significantly below unity showing dynamic stability. The estimated equation shows negative impact of inflation as expected and found in several empirical studies cited earlier. The associated t-statistic, however, shows significance only at 12.83% level. This may be the result of conflicting negative influence of inflation and positive influence through its impact on cash flows. This is also the result of structural changes in the economy. On the other hand, although highly significant, the sign of the coefficient of lagged growth rate in industrial production is negative, contrary to *apriori* expectation and findings of several empirical studies cited earlier. The examination of structural change helps in explaining this unexpected result.

ANALYSES OF STRUCTURAL CHANGE AND OUT-OF-SAMPLE FORECASTING

The possible structural changes during the post-oil-shock period of 1980's, the stock-market-boom (or Clinton-era) period after 1992 and the period following the tragedy of September 11 of 2001 have been examined. The calculated Chow test statistic for structural breaks at January 1980, January 1992 and October 2001 are calculated as 0.2393, 4.1104 and 0.8434 with corresponding p-values of 0.9160, 0.0028 and 0.4983, respectively. Thus, only the period after 1992 seems to exhibit significant structural break. Following this lead, a slope dummy has been introduced with value 0 before 1992 and 1 thereafter. The resulting equation seems to fit the data well with the slope dummies for annual data as in Table 4.

Table 4: Regression Results with Slope Dummies

Variables	Coefficients	t-statistic
Intercept	4.2235	4.0814
Y(-1)	0.8769	38.8035
X(-1)	-0.4052	-4.9554
Z(-1)	-0.3444	-2.6120
D.X (-1)	0.7767	3.8325
D.Z (-1)	-1.3112	-3.3751
$\overline{R}^2$ = 0.8484, DW = 1.9873, F =455.36, AIC = 6.5697		

Table 4 shows that the slope of lagged industrial growth is negative before 1992 and positive after 1992. In other words, the growth in industrial production before 1992 unleashed negative influences on S &P 500, while after 1992 industrial production growth appears to boost stock market returns. The negative impact of inflation seems to have increased further after 1992. Moreover; all coefficients are now more significant as compared to the associated t-values in Table 3.

The model is re-estimated further with slope dummies using 12-month, 18-month and 24-month moving averages. The comparative results are reported in Table 5.

Table 5 unveils gradual significant improvements in $\overline{R}^2$'s and F -statistics. As observed, the estimates with 24-month moving averages produce the best overall results, although some of the associated t-values decline as compared to those relating to 12-month and 18-month averages.

Since the model with slope dummy variables appears to be highly successful, it is used in the forecasting exercise. To implement the out-of-sample forecasting, the entire sample period is divided into January 1970 to December 2003 and January 2004 to December 2004.

Table 5: Regression Results With Moving Averages of Monthly Returns			
Variables	Coefficients (12-Month moving average)	Coefficient (18-Month moving average)	Coefficients (24-Month moving average)
Intercept	0.3045	0.1825	0.1222
	(3.7382)	(2.8114)	(2.2744)
Y(-1)	0.8840	0.9204	0.9394
	(39.0786)	(44.8463)	(50.1202)
X(-1)	-0.3766	-0.2573	-0.1991
	(-4.9581)	(-3.9196)	(-3.9382)
Z(-1)	-0.3018	-0.1584	-0.0873
	(-2.3252)	(-1.5816)	(-1.0942)
D. X(-1)	-0.8476	0.5750	0.4430
	(4.3549)	(3.6399)	(3.5430)
D.Z(-1)	-1.3997	-0.8315	-0.5589
	(-3.7395)	(-2.9141)	(-2.7507)
	$\overline{R}^2$ =0.8574	$\overline{R}^2$ =0.8964	$\overline{R}^2$ = 0.9215
	DW=2.0070	DW=2.0875	DW=1.9890
	F=460.3684	F= 652.0145	F= 869.9209
	AIC=1.4256	AIC= 0.7400	AIC= 0.1352

The sub-sample for the period of January 1970 to December 2003 is used for estimation of the regression equation with slope dummy variables. The estimated equation is used to forecast stock market returns for out-of-sample period of January 2004 to December 2004. Since the estimated coefficients are very close to those in Table (4), they are no more reported here. The calculated test statistics for out-of-sample error are as follows:

Root Mean Squared Error = 4.8728;
Mean Absolute Error =4.0790;
Mean Absolute Percent Error = 26.8455;
Theil's Inequality Coefficient = 0.1188;
Bias Proportion = 0.0225;
Variance Proportion = 0.0325; and
Covariance Proportion = 0.9449.

These statistics show that the out- of -sample forecasting power of the model is quite high. In particular, Covariance Proportion is quite high while Bias and Variance proportions are low and the Theil's Inequality Coefficient is small. Appendixes III and IV show the graphs of actual and predicted stock returns that closely correlate with each other.

CONCLUSIONS AND REMARKS

This study arrives at an interesting conclusion that the time horizon for calculating stock market returns makes a very large impact on the explanatory power of macroeconomic variables using the same set of monthly data. When stock market returns are calculated over a month, the model fails to capture even 1 percent of variance. In contrast, the model captures more than 84 percent of variance when stock market returns are calculated over the year using the same set of monthly data. As such, there is no need to search for higher frequency data only to improve the explanatory power of the model. The more important step is to calculate stock market returns in line with investors' general attitude which seems to be much longer than a month.

Out of the four macroeconomic variables with presumptive linkages to stock market returns, the rate of growth in industrial production and the rate of inflation seem to be highly significant, while the rate of change in broad money supply and the change in federal funds rate seem to contribute insignificantly. The investigation of structural change shows that the stock-market-boom period after 1992 exhibits significant shift in the slope of the explanatory variables while the post-oil-shock period after 1980 and the period after September 11, 2001tregedy show little change.

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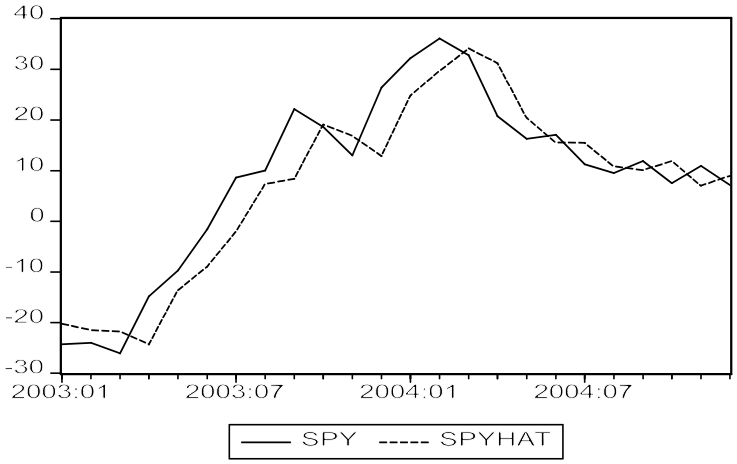
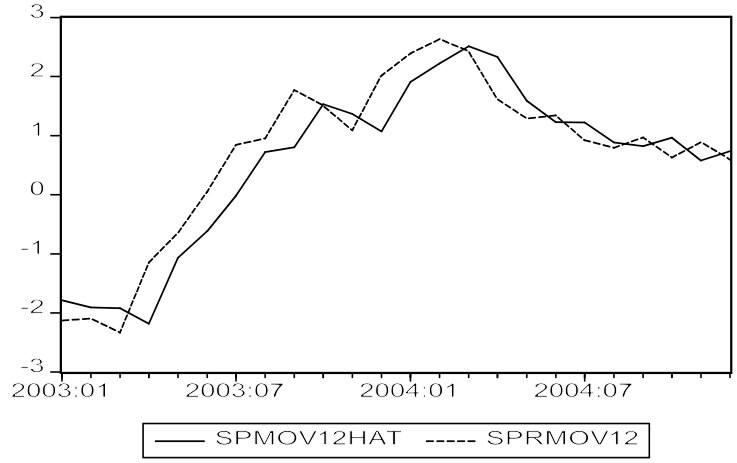
Appendix -I : Descriptive Statistics					
Panel A: Monthly Data					
(January 1970-December 2004)					
Descriptors	Y	X	Z	V	L
Mean	0.732257	0.220566	0.387357	-0.016277	0.571366
Median	0.907647	0.267195	0.317797	0.010000	0.571366
Std. Dev.	4.463956	0.722525	0.314443	0.647478	0.379067
Skewness	-0.369232	0.769313	0.929301	-1.969196	0.654680
Kurtosis	4.826096	6.609577	4.477363	34.24561	5.790072
Panel B : Quarterly Data					
Descriptors	Y	X	Z	V	L
Mean	2.177878	0.668009	1.170113	0.161825	1.734501
Median	2.209438	0.852499	0.945068	-0.181159	1.696773
Std. Dev.	7.744188	1.636548	0.826333	15.63967	0.980526
Skewness	-0.420173	-1.247963	1.103310	0.478690	0.421388
Kurtosis	4.113378	7.444116	4.090962	5.364808	3.883736
Panel C: Annual Data					
Descriptors	Y	X	Z	V	L
Mean	9.279876	2.797704	4.806700	-0.171520	7.187903
Median	10.57650	3.260724	3.667071	-0.255000	7.324172
Std. Dev.	16.45477	4.514919	3.099999	2.539753	3.317056
Skewness	-0.244591	-0.654629	1.332394	0.257376	0.012370
Kurtosis	2.752072	3.599568	3.944062	4.614925	2.463416

Appendix -II : Correlation Matrices					
Panel A: Monthly Data					
Descriptors	Y	X	Z	V	L
Y	1.000000	-0.055669	-0.163406	-0.167707	0.026964
X	-0.055669	1.000000	-0.082640	0.338491	-0.005502
Z	-0.163406	-0.082640	1.000000	0.072045	0.053184
V	-0.167707	0.338491	0.072045	1.000000	-0.114016
L	0.026964	-0.005502	0.053184	-0.114016	1.000000
Panel B : Quarterly Data					
Descriptors	Y	X	Z	V	L
Y	1.000000	-0.051101	-0.220252	-0.193841	0.077390
X	-0.051101	1.000000	-0.144781	0.432143	-0.002386
Z	-0.220252	-0.144781	1.000000	0.204371	0.065618
V	-0.193841	0.432143	0.204371	1.000000	-0.165035
L	0.077390	-0.002386	0.065618	-0.165035	1.000000
Panel C: Annual Data					
Descriptors	Y	X	Z	V	L
Y	1.000000	0.142713	-0.271819	-0.125554	0.046661
X	0.142713	1.000000	-0.287419	0.537450	0.029809
Z	-0.271891	-0.287419	1.000000	0.323948	0.199346
V	-0.125554	0.537450	0.323948	1.000000	-0.164699
L	0.046661	0.029809	0.199346	-0.164699	1.000000

Appendix-III : Forecasting With Annual Data



Appendix-IV : Forecasting With 12 Month Moving Average



E-DISCLOSURE OF FINANCIAL INFORMATION AND THE CAPACITY TO BORROW

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ABSTRACT

A content analysis of 141 Web sites of small and large US companies across four different industries was conducted to investigate the patterns of information disclosure. An instrument was specially designed to quantify the level of information disclosure. Using regression analysis and discounted cash flow model, a strong negative association was found between the level of e-disclosure and the cost of capital. The results remained significant even after controlling for risk characteristics and size of firm. Findings show that Internet disclosure is useful in attracting investors and lowering the cost of capital by as much as 4.7%.

INTRODUCTION

From time to time, businesses irrespective of their size, have to raise capital from financial markets to start new ventures as well as expand their operations. To do so, they need to assure investors that their money is safe and will generate good returns. Relevant and timely information disclosure along with good public relations has been traditionally used by firms in attracting investment. However, companies, especially small businesses and entrepreneurs, are reluctant to share information. They are also uncertain about what information and how much of it should be disclosed.

When relevant information is withheld, it leads to an information gap between insiders and outsiders of the firm known as information asymmetry (Welker, 1995; Healy, Hutton and Palepu, 1999; Leuz and Verrecchia, 2000). According to Myers and Majluf (1984), equity and debt offerings become more expensive if the firms do not reduce the information asymmetry problem. Realizing this, today an increasing number of firms are providing information to the public sometimes beyond their legal obligations. Further, the Internet is becoming the medium of choice for such information dissemination. It is especially appealing to small business due to its cost-effectiveness and instantaneous global reach. For entrepreneurs with no store-fronts, Internet may be the only tool to handle transactions, project an image and conduct public relations. But many businesses wonder if Internet disclosure brings more harm than benefit to their interests.

The objective of this study is to evaluate if information disclosed in corporate Web sites has an effect of reducing the cost of raising capital. The topic is relevant for two reasons: i) the Internet has evolved technologically, in functionality, global reach and cost-effectiveness, ii) the Internet communication with investors is gaining more importance particularly after the passage of Regulation Fair Disclosure (RFD) 2000, whereby SEC requires firms to provide all material information to all investors simultaneously. The Internet is the only medium that meets this requirement. The Sarbanes-Oxley Act had also a similar impact. The goal of the Sarbanes-Oxley Act is to protect investors by improving the accuracy and reliability of corporate disclosures (U.S. House, 2002). While there have been several studies in the past investigating the effect of traditional methods of information delivery on cost of capital, research is still continuing in assessing how Internet-based delivery mechanisms might modify our pre-Internet era conclusions (Easley & O'hara, 2004; Strom, 2005).

Theoretical evidence suggests a negative relationship between disclosure level and the cost of equity capital in legacy (ie. pre-Internet) settings (Diamond and Verrecchia, 1991, SEC 2007). Empirical research in the Internet setting, however, is confronted with major methodological difficulties in developing a measure for the disclosure level. In this study, a specially designed instrument is used to measure Internet disclosure based on the content analysis of current corporate Web sites. The implied cost of capital is estimated from market prices and analyst earnings forecasts using a comprehensive discounted cash flow model. The implied cost of equity capital is then regressed against the disclosure level, making the necessary corrections for other potentially influential variables such as firm size and different risk factors.

The remainder of this paper is organized in the following sequence. First, prior research on the topic is reviewed. Second, the hypothesis being tested, research design, instrument validation and sample selection are presented. In the final section, data collection and analysis are described followed by the elaboration of results and implications.

PRIOR RESEARCH

Prior research is discussed under two subsections: i) Studies that involved the use of Internet for information disclosure, and ii) Studies that focused on the relationship between legacy disclosure methods and cost of capital.

Studies on Internet-based Disclosure

Internet reporting is a phenomenon tied to the development of this medium in the mid 1990s. The early studies on Internet reporting from 1996 until 1998 mostly focused on the existence or non-existence of Web sites and whether they carried any financial information. Prominent among these studies were Petravick and Gillett (1996), Louwers, Pasewark and Typpo (1996), Gray and Debreceny (1997), and Deller, Stubenrath and Weber (1998), and Lymer (1999). Unfortunately,

these findings have diminished currency in today's world due to the rapid development of the Internet in recent years. To illustrate this point, take Deller, Stubenrath and Weber (1998). They analyzed the Web sites of 100 US, 100 UK and 100 German firms representing each country's stock market. Their study showed that 95% of the US, 85% of the UK and 76% of the German companies had Web sites. Further, 91% of US companies, 72% of UK and 71% of German companies used their Web sites for investment related disclosures. Balance sheet data was supplied by 86% of the US, 53% of the UK and 46% of the German corporations.

The IASC (1999) report examined 660 corporations in 22 countries around the world. The results showed that 86% of the corporations had presence on the Internet and 62% of companies made some form of financial reporting on their Web sites. The FASB study (2000) surveyed the Fortune 100 companies. They found that 99 companies had Web sites of which 93 had some form of investor relation section. Within this section, more than 80% of the companies provided general corporate information and 73% provided financial summaries. Still fewer provided detailed financial reports such as an income statement (65%), depreciation & amortization (57%) or segmental reporting (28%). They found that 34 of the 292 possible items appeared on more than 50 percent of the Web sites. The most popular financial and business reporting attribute was the chairman's message, which appeared on 74% of the 99 Web sites.

There were also a number of studies that examined the firm's characteristics that seemed to encourage disclosure through the Internet medium. Marston and Leow (1998) as well as Ashbaugh, Johnstone, and Warfield (1999) found that large and profitable firms were more likely to disclose their financial information on the Internet than others. The latter study further found that firm size was the only significant variable explaining the dissemination of either a comprehensive set of financial statements, a link to the annual report elsewhere on the Internet, or a link to the SEC's EDGAR site. Ettredge, Richardson, and Scholz (1999) concluded that the amount of financial disclosure on corporate Web sites was positively related to firm size, the need for new external equity capital and the quality of the firm's traditional corporate reporting practices. They also noted that higher level of analyst-following was associated with objective and extensive financial information. Similarly, a higher level of retail ownership was associated with more subjective and abbreviated financial data.

In a later study Ettredge, Richardson, and Scholz (2002) distinguished between voluntary and required information items. They examined the dissemination of information for investors on corporate Web sites based on a list of 4 required items under law and 12 voluntary information items. Required items included quarterly reports (57%), annual reports (53%) and links to SEC-EDGAR (51%). The most common voluntary item on a company's Web site was the financial news releases found on 81% of the sites. Other voluntary items were transfer agent information (56%) and stock price links to other Web sites (50%). The authors determined that 3 out of 4 required items were found on more than half of the sites, compared to only 3 out of 12 voluntary items.

The above researchers also found that the presence of required items was significantly associated only with size and information asymmetry, while voluntary information item disclosure

was associated with size, information asymmetry, demand for external capital, and firms' traditional disclosures. They concluded that Web site disclosure was not associated with firm performance, measured as returns for the preceding year, and that Web site disclosure was negatively associated with the correlation of earnings and returns. Their findings were consistent with the traditional disclosure study by Lang and Lundholm (1993).

Studies on Legacy-based Disclosure

Legacy-based disclosures refer to non-Internet channels for information dissemination. In the pre-Internet era, many researchers were interested in the relationship between disclosure and the cost of raising capital in financial markets. Botosan (1997) was one of the pioneers in the field. She used a complex version of the residual income model to estimate the cost of capital and built her own measure of disclosure level based on the amount of voluntary information provided in the annual reports. She found a significant negative relationship between the disclosure level and the cost of equity capital. Her results, however, were more geared toward firms with analyst following. Analyst following refers to the occurrence when financial market analysts begin following a company's stock that they are optimistic about.

Richardson and Welker (2001) examined the relationship between financial and social disclosure in Canada. Social disclosure pertains to revealing information about the potential impact of a company's operation on the society in general. Company's impact on environment is an example. They found that financial disclosure was negatively correlated to the cost of equity capital for firms with low analyst following. Contrary to expectations, the cost of equity capital was positively related to social disclosures.

Hail (2002) examined the relationship between the cost of capital estimated with the residual income model proposed by Gebhardt, Lee and Swaminathan (2001) and the quality of voluntary disclosure provided in the annual report. For a cross-sectional sample of 73 non-financial Swiss companies, he found a negative and highly significant association between the cost of equity capital and annual report disclosure. The magnitude was such that the most forthcoming firms benefited about a 1.8% to 2.4% cost advantage over the least forthcoming firms. The findings persisted even after controlling for other potentially influential variables like risk characteristics and firm size. Hail concluded that one reason for the stronger relationship in Switzerland compared to the US might be the lower overall disclosure level in Switzerland.

Chen, Chen and Wei (2003) also examined the relationship between disclosure level and the cost of equity capital in a relatively lower disclosure environment compared to the US. They examined 545 firm-year observations across Asia's nine emerging markets. They also found that higher disclosure scores reduced the cost of equity capital by 1.26% after controlling for risk and size factors.

There were also studies that provided contrary results. Botosan and Plumlee (2000) investigated the relationship between the cost of capital and three different types of disclosure

provided by the Association for Investment Management & Research (AIMR). The three types of disclosure were: i) annual report, ii) quarterly and other published reports, and iii) investor relation disclosure. For the estimation of the cost of equity capital, they used four alternative methods: i) the classical dividend discount model, ii) the residual income valuation model used in Botosan (1997), iii) a finite horizon specification of the Gordon growth model (Gordon, 1997), and iv) the residual income model described in Gebhardt, Lee and Swaminathan (2001).

The results of the study were, however, mixed. The authors found that the cost of capital decreased when information was disclosed using annual reports. The magnitude of the difference in cost of capital between the most and least forthcoming firms was approximately 0.5-1%. Surprisingly, they found a positive association between the cost of capital and the level of more timely disclosures such as in the quarterly report. They explained the contrary result with the opinion of managers' claiming that more timely disclosure increase cost of capital, possibly through increased stock price volatility. Finally, they found no association between the cost of equity capital and the level of investor relations activities. They concluded additionally that aggregating across different disclosure types to a measure of total disclosure leads to no association with the cost of capital because the relationship depended on the type of disclosure.

Kothari and Short (2003) examined the impact of disclosure on the cost of equity capital estimated with the Fama and French 3-Factor model in two ways: i) separating favorable and unfavorable disclosure, and ii) segregating disclosure by sources (corporate, analysts and business press disclosure). They found that positive corporate press news did not materially affect cost of capital while negative news did. The impact of both positive and negative news by analysts on the cost of capital was less significant than for the other disclosure sources. Intuitively the results suggested that analysts have a credibility problem or are responding to market changes after they have taken place.

Recently, Seow and Shangguan (2005) examined voluntary disclosures of information on intangibles in firm's annual reports and its effect on the incremental cost of capital. They found the impact to be relatively low. They attribute their contradictory finding to the proprietary and non-verifable nature of information being disseminated.

From the above discussion of the legacy studies, despite some inconclusiveness, researchers today seem to accept a general consensus that disclosure do tend to reduce cost of capital. However, no single study has yet specifically devoted itself to verify if the same consensus is extensible to Internet-based disclosure as well. This is because Internet grew from humble beginnings, had been in flux as it developed technologically in speed, functionalities and geographic diffusion. Past investigators could not foresee its powerful roles that we have realized today. Further, they never visualized firms that had Web sites with information to offer about themselves where the motivation was to build and maintain a relationship with the public. Also, they did not perceive information that was being provided objectively beyond legal requirements as being able to deliver a business image that was open, honest and sincere at the Internet site that can have impact of the cost of raising capital in the long run. This study is a step in that direction.

RESEARCH DESIGN

Hypothesis

As discussed in the earlier section, previous research suggest that a higher level of disclosure involving legacy-based physical distribution channels is accompanied by a lower cost of equity capital. In this study, we examine this relationship in a disclosure setting that uses Internet as the virtual dissemination medium. This modern type of disclosure needs careful examination because the Web sites have today become a major tool in communication between the company and its investors. One would expect that the earlier findings will continue to prevail for the new medium as well. A higher investor relation Internet disclosure level should, therefore, lower the cost of equity capital. Consequently, the following hypotheses were tested:

H_0: *The cost of capital is inversely proportional to the level of disclosure in the investor relation section of a company's Web site.*

H_A: *The cost of capital is not inversely proportional to the level of disclosure in the investor relation section of a company's Web site.*

Methodology

There were two challenges in empirically testing the above hypothesis. The first difficulty was the measurement of the level of disclosure on the companies' Web sites. This was solved in this study by developing a specially desgined instrument that relies on a comprehensive site-content analysis. The second hurdle was estimating cost of equity capital. To overcome this, the Discounted Cash Flow (DCF) model developed by Froidevaux (2004) was used. Both of these along with their validation are further explained in the following sections. Finally, regression modeling was used to examine the relationship between the disclosure level and the cost of capital. To isolate the potential impact of risk and firm size, we repeated the analysis using multiple regression by including them as independent variables along with the Internet-disclosure level variable.

Sample

The study covered four industries: Healthcare, Industrial goods and services, Consumer discretionary, and Information technology (Table I). The companies in each industry were divided into two subgroups and classified as small or large based on their market values and sales volume (Table II). It proved, however, difficult to find a large number of companies for each of these eight subgroups, comparable in both of these size measures in each industry. Data obtained from Research Insight of the Standard & Poor's financial data services helped identify about 20

companies in three of the eight least populated subgroups. In order to keep the number of companies in each subgroup about the same for ensuring validity of our results, a decision was made to use a sample size of 20 for each of the eight subgroups. This led to a total sample size of 160 (20x8) for the study. Nineteen of these companies had to be later excluded due to bankruptcies, lack of analysts following, and technological problems in the process of saving their Web sites. This resulted in a final sample size of 141 companies.

Table I: Number of Firms by Industry and Size

	Large	Small	Total
Healthcare	20	19	39
Industrial Goods and Services	20	18	38
Consumers	18	15	33
Information Technology	16	15	31
All Companies	74	67	141

Table II: Size Criteria

Companies	Large (in billion USD)	Small (in million USD)
Healthcare Industry		
MVAL	>$4	$500-$1700
SALES	>$3	$400-$1700
Consumer Discretionary Industry		
MVAL	>$4.8	$500-$1000
SALES	>$5	$500-$1500
Industrial Goods and Services Industry		
MVAL	>$6	$500-$1000
SALES	>$6	$500-$1750
Information Technology Industry		
MVAL	>$5	$500-$1500
SALES	>$4.3	$460-$1700

Measurement of Internet Disclosure Level

Over a chosen 3-days holiday weekend, the Web sites of the sampled companies were accessed and archived to get a snapshot in time. They were later analyzed for their contents. A superset of 102 distinct atomic information items were identified from the contents of all the Web

sites. These items lent themselves to be grouped into four categories: i) Corporate Information, ii) Financial and Stock, iii) Management and Board of Directors, and iv) General Items. Each of these was further subdivided into logical groupings. For example, the Corporate Information category was divided into Company overview, Products & Services, Operations, News, and Sustainability information. To give an idea of these atomic items to the reader, Table III shows the 28 individual items in the Corporate Information category.

While measuring the disclosure level of a given Web site, a score of '1' was given for each of the superset of 102 items detected and a '0' otherwise. The sum of '1's, was assigned as the Internet Disclosure score (INTDISC) for that site. It would be a measure of how forthright was the firm in its disclosure of information to the public. A company could score a maximum of 102 if all information was provided and a minimum of zero if no items were provided. The score for each company in each of the four item categories was created by adding the scores of the individual items within that category. This methodology facilitated comparison among companies within different information categories or even information items at the atomic level. In fact, one could use it to compare disclosure patterns among various industries as well.

Table III

INFORMATION ITEMS
Corporate Information Category
Company Overview
General description of the companys' business
Company's history
Company's strategy
Company's broad goal or objectives
List of business units or organizationalal chart
Description of business units
Industry specific information
Products & Services
List of principle products and services
Description of principle products and services
Discription of the users of the products
List of principle brands, registered trademarks
Principle markets
New products
List of suppliers
Operations
Description of property, plants and equipment
Technology and innovation, (R&D)
Partners
Distribution channels
Manufacturing or service production
News
News
Archived news
Earnings releases
Historical earnings releases
Frequently Asked Questions (FAQ)
Sustainability Information
Economic sustainability information (wages, job creation,etc)
Environmental information
Social information (health and safety, contributions)
Commitment to stakeholders, mission

Validity of the INTDISC Measure

The validity of our Internet disclosure level (INTDISC) was assessed in the following manner. Since reporting strategies would typically be based on management decision and coordinated within the company, the components of the different three disclosure categories should exhibit a positive relationship with one another (Lang and Lundholm, 1993). Accordingly, the relationship between the overall company disclosure score INTDISC and its three sub components INTDISC1, INTDISC2 and INTDISC3, were examined. INTDISC1 referred to the score on the Corporate Information category, INTDISC2 to the Financial and Stock category and INTDISC3 to the Management and Board of Directors. Table IV shows that the categories were not only positively related to each other but the relationship was also highly significant at 1% level of statistical significance (p=0.0). This test confirmed the validity of the disclosure score methodology.

Table IV: Internal consistency of the disclosure score: Pearson correlation coefficients and *p*-values

Variable	INTDISC	INTDISC1	INTDISC2	INTDISC3
INTDISC	1	0.673	0.851	0.782
p-value	*0*	*0.000* ***	*0.000* ***	*0.000* ***
INDISC1		*1*	*0.342*	*0.453*
p-value		*0*	*0.000* ***	*0.000* ***
INDISC2			*1*	*0.437*
p-value			*0*	*0.000* ***
INDISC3				*1*
p-value				*0*

*** indicates 1% statistical significance in the direction predicted.

Estimation of Cost of Equity Capital

Discounted Cash Flow (DCF) model had been used in estimating the cost of equity capital in prior research. DCF models define the intrinsic value of common stock as the present value of its expected future cash flows. The value of common stock is, therefore, determined by the stream of expected cash flows in the numerator and the required rate of return or discount rate in the denominator of the DCF model. The DCF model is expressed mathematically as follows:

$$V_0 = \sum_{t=1}^{n} \frac{CF_t}{(1+k)^t}$$

V_0= Value of the stock in t=0
CF = cash flow generated by the asset for the owner of the asset in period t,
k = discount rate or cost of equity capital
n = number of years over which the asset will generate cash flows to investors

The implied cost of capital can be calculated by substituting cash flow forecasts and the current stock price into the above equation and then by solving for the discount rate. This discount rate is also known as the Implied Discount Rate (IDR). IDR is an estimate for the cost of equity capital implied in current market prices.

A variation of DCF is the Discounted Free Cash Flow (DFCF) model. Free cash flow (FCF) is the cash flow available to the company's owners after all operating expenses, taxes, interest, and principal payments have been paid and the necessary investments in working capital and fixed capital have been made (Damodaran, 2001). Froidevaux (2004) showed that a DFCF model can explain stock prices within a 10% range of market values. Lee, Ng and Swaminathan (2003) also found DFCF model to be a valid method to estimate the ex ante cost of capital. Hence, the DFCF model was used in this study.

Validity of the Cost of Capital Estimates

To test the validity of this measure obtained from the DFCF model, its relationship with the different firm characteristics of i) market capitalization (MVAL), ii) book value of debt to market value of equity (BVDMVE), iii) the current ratio (CR), and iv) the price-to-earnings ratio (PER), which are generally considered as related to cost of capital were examined. Market capitalization (MVAL) is a measure of size and size has been shown to be one of the strongest determinants of the cost of equity capital (Gebhardt, Lee and Swaminathan, 2001). Book value of debt to market value of equity (BVDMVE) is a measure of financial leverage. The higher the leverage, the higher is the risk and thus the higher the discount rate (Modigliani and Miller, 1958). Bhandari (1988) and Fama and French (1992) documented empirically a positive relationship between leverage and stock returns. Similarly, the current ratio (CR) is a measure for short-term solvency. The higher the ratio, the higher is the financial risk of the company and the higher the discount rate should be. The price-to-earnings ratio (PER) has been shown for many years to be related to stock market returns. Lakonishok, Shleifer and Vishny (1994), and Dreman (1998) showed that low P/E stocks earn positive abnormal returns relative to the market and high P/E stocks negative abnormal returns.

Hence, many authors (e.g. Fama and French, 1992) hypothesized that PER is a risk proxy; the lower the ratio the higher the returns and therefore theoretically the higher the risk.

Keeping the above findings from the past research in mind, a regression was run between the cost of capital estimate derived from DFCF model and the firm characteristics just described, namely, market capitalization value (MVAL), book value of debt to market value of equity (BVDMVE), the current ratio (CR) and the price-to-earnings ratio (PER). The results are shown in Table V. It can be seen that the directions of the regression coefficients are as expected. The *p*-values also indicate that they are statistically significant. This provided validation to our cost of capital measure.

Table V Cost of capital and firm characteristics

		Intercept	MVAL (-)	BVDMVE (+)	CR (-)	PER (-)	Adj. RSQ
Panel A:	*Simple Regression (OLS)*						
Coefficient		0.1074	-0.0076				0.0628
P-Value		*0.0000*	*0.0016* ***				
Coefficient		0.0774		0.0065			0.0231
P-Value		*0.0000*		*0.0397* **			
Coefficient		0.0860			-0.0041		0.0230
P-Value		*0.0000*			*0.0399* **		
Coefficient		0.0910				-0.0006	0.0599
P-Value		*0.0000*				*0.0020* ***	
Panel B:	*Multiple Regression (OLS)*						
Coefficient		0.1235	-0.0088	0.0046	-0.0041	-0.0004	0.1472
P-Value		*0.0000*	*0.0004* ***	*0.1310*	*0.0642* *	*0.0710* *	

***, **,*, indicates 1%, 5%, and 10% significance in the direction predicted.

RESULTS

Descriptive Statistics

Descriptive statistics for the Internet disclosure scores (INTDISC) of the 141 firms studied are shown in Table VI. It may be recalled that the scores can vary between 0-102. In our sample, the scores observed for the full sample was between 6 and 56, thus giving rise to a spread of 50 points.

Table VI: Descriptive Statistics for Disclosure Scores

			Percentile					Standard
Variable	n	Mean	Min	25%	50%	75%	Max	Deviation
Full Sample								
INTDISC	141	27.29	6	20	28	34	56	10.39
INTDISC1	141	4.76	0	3	4	6	19	3.08
INTDISC2	141	17.51	4	13	17	22	30	5.99
INTDISC3	141	5.02	0	1	4	8	15	4.11
Large Companies								
INTDISC	74	30.30	10	24	30	36	56	10.49
Small Companies								
INTDISC	67	23.97	6	17	24	32	45	9.27

Additional descriptive analysis involving the firm characteristics of size and risk is provided in Table VII. Data for the full sample and the two sub-samples of small and large companies are presented separately. The descriptive statistics showed that the two size measures, market value (MVAL) and sales (SALES), indicated a substantial cross-sectional variation in firm size between the large and small companies. Market value of equity for the full sample ranges from $513 million at the first percentile to $223 billion at the 99th percentile of the distribution. Mean market value of equity for full sample was $20 billion. Sales for the full sample ranged from $458 million at the first percentile compared to $149.8 billion at the 99th percentile of the distribution. Mean sales was $12.5 billion. Further, consistent with our research design were the two size measures comparable within the small and large companies sub-samples. Large companies had all a market value range of $5.1-$274 billion and small companies between $503 million and $1.68 billion. The mean value for market capitalization (sales) was $37.5 billion ($23 billion) for large and $856 million ($925 million) for small companies.

Table VII Descriptive statistics for sample firms (in $ Millions)

Panel A: Full Sample

			Percentile					Standard
Variable	n	Mean	1%	25%	50%	75%	99%	Deviation
Size:								
MVAL	141	20077	513	810	5565	19786	223154	42559
SALES	141	12489	458	873	4356	13829	149826	25636
Risk:								
BETA	141	0.828	-0.121	0.450	0.712	1.104	2.313	0.544
BVDMVE	141	0.339	0.000	0.062	0.181	0.400	3.530	0.605
CR	141	1.549	0.000	0.900	1.410	2.120	3.380	0.898
PER	141	19.719	8.784	13.815	16.754	21.896	51.345	10.019
Disclosure:								
ANALYSTS	141	14	2	7	12	18	35	8
INTDISC	141	27	7	20	28	34	50	10
INTDISC1	141	5	0	3	4	6	16	3
INTDISC2	141	18	5	13	17	22	29	6
INTDISC3	141	5	0	1	4	8	14	4
Implied cost of capital:								
IDR	141	12.48%	8.42%	10.82%	12.31%	13.82%	17.95%	6.77%

Panel B: Sample of Large Companies

			Percentile					Standard
Variable	n	Mean	1%	25%	50%	75%	99%	Deviation
Size:								
MVAL	74	37,480	5095	9418	18953	30854	274197	53174
SALES	74	22,958	3178	7814	12673	22602	168426	32038
Risk:								
BETA	74	0.831	-0.042	0.465	0.767	1.079	2.245	0.503
BVDMVE	74	0.456	0.001	0.083	0.211	0.403	6.362	1.060
CR	74	1.261	0.000	0.775	1.205	1.548	3.445	0.808
PER	74	20.064	8.784	14.178	17.467	22.053	51.345	9.980
Disclosure:								
ANALYSTS	74	19	6	14	18	25	37	7
INTDISC	74	30	10	24	30	36	53	10
Implied cost of capital:								
IDR	74	12.06%	8.00%	10.44%	12.05%	13.15%	17.32%	2.27%

Panel C: Sample of Small Companies

			Percentile					Standard
Variable	n	Mean	1%	25%	50%	75%	99%	Deviation
Size:								
MVAL	67	856	503	651	802	921	1683	300
SALES	67	925	450	606	830	1185	1683	358
Risk:								
BETA	67	0.832	-0.100	0.455	0.681	1.207	2.471	0.584
BVDMVE	67	0.266	0.000	0.020	0.168	0.351	1.564	0.330
CR	67	1.921	0.000	1.150	1.820	2.525	4.965	1.046
PER	67	19.338	8.784	13.392	15.771	21.750	51.345	10.124
Disclosure:								
ANALYSTS	67	7	2	4	7	10	18	4
INTDISC	67	24	7	17	24	32	40	9
Implied cost of capital:								
IDR	67	12.93%	9.05%	11.39%	12.75%	14.15%	18.42%	2.16%

Risk Factor for Large vs. Small Companies

Four different risk measures were used: beta, financial leverage, the current ratio and the price-to-earnings ratio. Market beta of the stock is a measure for systematic risk (Botosan, 1997; Chen, Chen and Wei, 2003). As for financial leverage, higher a company's relative debt position, the riskier the stock is. The lower the current ratio, the higher is a company's short-term debt position compared to its short-term assets and therefore the higher is the probability of bankruptcy. The price-to-earnings ratio shows how much investors are willing to pay for one dollar of expected future earnings. Many studies have shown that PER is an important risk measure as stocks with low P/E ratios had historically higher average returns. The lower the ratio, the higher is therefore the risk. The descriptive statistics for these measures are provided in Table VII. For the large companies, the mean BETA was 0.831 and for the small companies 0.832. The PERs were 20.06 and 19.34 respectively. The normally higher business risk of small companies was thus not reflected in beta. This was because small companies seem to compensate their higher business risk with lower financial risk than large companies as reflected by their BVDMVE ratios. The large companies had a BVDMVE of 0.456 as compared to 0.266 for the smaller companies. Overall, this made the large and small sub-samples comparable in terms of risk.

Hypothesis Testing

A regression was run with the Internet Disclosure Score (INTDISC) as the independent variable and the cost of capital (measured by the Implied Discount Rate/IDR) as the dependent variable. The result is shown in Table VIII. There was a negative relationship which was significant at 0.01 level. The *p*-value close to zero further corroborated this. Hence, we did not reject the null hypothesis that higher level of disclosure at Internet sites would reduce the cost of capital. This was not only in agreement with the prior research but the very small *p*-value brought out the fact that the Internet was probably even a better medium for reducing information asymmetry than the traditional methods used before the Internet era.

Table VIII: Simple Lineaar Regression Results

$$IDR = \gamma_0 + \gamma_1 INTDISC + \varepsilon$$

	Intercept	INTDISC (-)	MVAL (-)	BETA (+)
Coefficient	0.094433431	-0.000545295		
P-Value	1.67233E-38	0.002657664***		

Additional analysis was done to determine if the relationship remained strong when we corrected for the firm's characteristics of (i) risk and (ii) size. We performed a multiple regression with BETA and MVAL alongside INTDISC as independent variables. The result is shown in Table IX. The relationship between INTDSC and cost of capital still remained significant at 0.05 level (p=0.016). This result led to the conclusion that irrespective of the firms' risk and size, Internet-based disclosure continued to be negatively and strongly correlated to the cost of capital. In other words, all companies irrespective of risk or size stood to benefit by providing useful disclosures to the investing public. This is an important finding of this study.

Table IX: Multiple Regression Results

$$IDR = \gamma_0 + \gamma_1 INTDISC + \gamma_2 MVAL + \gamma_3 BETA + \varepsilon$$

	Intercept	INTDISC (-)	MVAL (-)	BETA (+)
Coefficient	0.093902928	-0.000464253	-5.87155E-08	-0.000604
P-Value	9.28979E-34	0.015549485**	0.204494944	0.861026

The negative coefficient for MVAL was consistent with prior literature. Although not significant, it should be noted that the *p*-value at 0.20 lay closer to the significance region than otherwise. The negative coefficient of beta was as expected but it was not significant in the regression equation (p=0.86). This need not be an unacceptable result considering that in prior research there had been occasions when the validity of beta as a risk measure raised some doubts (Gebhardt et al., 2001). When substituted beta with leverage (BVDMVE) and the price-to-earnings ratios (PER) and repeated the multiple regression to control for risk, we did find these variables to be significant (Table X).

Table X Regression of Cost of Capital on Market Value, Leverage, Price-to-Earnings ratio and Disclosure Score

	Intercept	MVAL (-)	BVDMVE (+)	PER (-)	INTDISC (-)
Multiple Regression (OLS)					
Coefficient	0.09139	-5.31798E-08	0.00618		**-0.00047**
P-Value	*0.00000*	*0.24395*	*0.04310* **		***0.01235*** *
Multiple Regression (OLS)					
Coefficient	0.10381	-5.49742E-08		-0.00055	**-0.00045**
P-Value	*0.00000*	*0.21933*		*0.00249* ***	***0.01506*** *

During the discussion of descriptive statistics, it was seen that Internet disclosure scores among the 141 companies had a 50 points spread (Table VI). Further, from the multiple regression analysis, it was concluded that for every point increase on the Internet disclosure score, the cost of capital decreases by -0.000464 (Coefficient of INTDISC in Table IX). The 50 disclosure point difference between the most and the least forthcoming firms thus translated into a difference in the cost of capital of 2.32% (50*0.000464=0.0232). These findings were not only statistically significant but also economically relevant. According to Bushee and Leuz (2003), disclosures reduce the firm's cost of capital only if it is useful and not self-serving. Our results thus implicitly show that the information in the investor relation section is useful and thus reliable and relevant for investors.

Results of Regression for the Large and Small Companies

There were 74 firms in the sub-sample of large companies with the remainder 67 in sub-sample of small companies (Tables I & VII). Regression analysis was performed independently on each sub-sample. The results are shown below (Table XI).

For the large company sub-sample, the simple regression indicated a negative relationship between disclosure level and the cost of capital being significant at the 5% level (p=0.04). (Table XI, Panel A). In the multiple regression that adjusted for firm size (MVAL) and risk (BETA), the results were negative as one would expect but significance level dropped to p=0.076.

The results of the sub-sample of small companies were still negative but not significant for either the simple (p=0.19)or multiple regression (p=0.39). The INTDISC coefficient calculated based on the multiple regression was somewhat smaller as well at -0.00025 (Table XI, Panel B). The weaker results might explain why small companies provided less information; for them the benefit in terms of lower cost of capital might not outweigh the tangible and intangible costs of disclosure. The cost of capital of such firms might be determined more by other factors such as business or financial risk or the quality of management rather than their level of Internet disclosure. It could also be that for small companies a similar relationship between the disclosure level and the cost of capital existed as for large companies but that our cost of capital measure used in this study is less valid for small companies. In fact, there were some challenges in estimating the cost of capital for small and volatile companies in our sample. This may well be a topic for future researchers.

Table XI: Multiple regression of cost of capital on market value, beta and disclosure score for the large and small company sub-samples

Panel A: Sub-sample of large companies

	Intercept	INTDISC (-)	MVAL (-)	BETA (+)	Adj. RSQ
Simple Regression (OLS)					
Coefficient	0.091093543	-0.000517231			0.043831
P-Value	*6.79617E-18*	*0.04063629* **			
Multiple Regression (OLS)					
Coefficient	0.088936282	-0.000471727	-3.61504E-08	0.002566	0.026604
P-Value	*4.26158E-15*	*0.07636725* *	*0.486293543*	*0.625562*	

Panel B: Sub-sample of small companies

	Intercept	INTDISC (-)	MVAL (-)	BETA (+)	Adj. RSQ
Simple Regression (OLS)					
Coefficient	0.093205778	-0.000379364			0.011521
P-Value	*2.57909E-19*	*0.188119576*			
Multiple Regression (OLS)					
Coefficient	0.106851271	-0.0002514	-1.58551E-05	-0.003767	0.038437
P-Value	*1.06512E-15*	*0.387925823*	*0.077683707* *	*0.406833*	

CONCLUSION

This study set out to ascertain if the level of information disclosure provided over the corporate Web sites has an effect on the cost of borrowing for a firm. Our analysis of the 141 company Web sites corroborate that disclosure and cost of capital are inversely and significantly related, even more so for the Internet medium compared to traditional methods of information

distribution. Further, the results persist even after controlling for variables such as risk and firm size. This is an important finding considering that US companies already operate in a rich disclosure environment. The effort of companies in developing and maintaining Web sites as a means of information disclosure appears to be paying off handsomely. Our study concludes that firms willing to be forthright in disclosing information have the potential to enjoy as much as 2.32% cost advantage while raising capital.

Another contribution of this work is the Web site content analysis that was developed to measure level of information disclosure. The taxonomy we offered in categorizing the information content in terms of corporate information, financial & stock, management & board of directors, and general items can be very useful for future designers of business Internet sites. It can also be used for information disclosure level comparisons by various firms in future research studies.

The message herein for all entrepreneurs is that they need to cast off market suspicions and be more forthright with financial markets. Honesty, openness and ethics in disclosure have its benefits. With regard to disclosure over the Internet, there is a broad spectrum of technology tools available today for creating of Web sites. There is no reason for those businesses that have not joined the Internet disclosure movement so far to wait any longer. Disclosure through Internet Web sites is here to stay and business must adapt as quickly as possible. It is another cog in the wheel that helps build a prosperous and flourishing financial market for all participants in the new global economic order.

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AN EMPIRICAL STUDY OF THE ATTRIBUTES IMPACTING THE DECISIONS OF ACCOUNTANTS TO ACCEPT A PAY CUT IN EXCHANGE FOR REDUCED WORK HOURS

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ABSTRACT

The issue of work loads, employee turnover, and flexible work schedules are very important issues facing the accounting profession. Past research suggests that accountants have high turnover and employers have a difficult time keeping female accountants.

The purpose of this paper is to determine the attributes that explain which employees desire flexible work schedules (a willingness to take a pay cut for a reduced work schedule). Although the idea of flexible work schedules has been around for some time, little empirical research exists attempting to determine the variables that determine which employees are willing to accept flexible schedules. The paper specifically looks at how gender and certification impact flexible work opinions.

The results of this study suggest that gender and certification status of the accountant impacts his/her desire for a flexible schedule. Female accountants are significantly more likely to desire a flexible schedule than males. Also, certified accountants are more likely to desire pay cuts for reduced work loads than noncertified accountants.

INTRODUCTION

Accounting is considered a well-respected and highly beneficial career choice for most college graduates. If a new graduate puts in his/her time to gain experience and knowledge, he/she can expect a good income and benefits and the prestige that goes with the "accountant" title. However, do the benefits exceed the costs of working in accounting? A career in accounting typically involves much more than a forty-hour a week job. Many accountants work sixty or more hours per week during tax season, and the workload does not always lessen during non-peak times (Solnik, 2005).

These increased workloads and extended hours can lead to increased levels of stress. A common term used to describe a situation where someone reaches his/her stress limit at work is job burnout. One answer to the problems of job burnout and work-family conflict is for CPA firms to

offer flexible work arrangements. The idea of flexible work schedules has been around for some time and has been documented in the work place as a major incentive in recruiting by Almer and Kaplan (2002). Almer and Kaplan documented higher job satisfaction and lower turnover among firms offering flexible hours.

However, little empirical research has attempted to identify the variables that determine which employees are willing to accept or desire flexible schedules. Not all employees desire flexible schedules and some employers may not have the resources to implement flexible schedules. Being able to identify, at the time of recruitment, employees that may desire flexible schedules later in their careers would be very useful to employers.

The purpose of this paper is to identify the attributes associated with employee desires for flexible work schedules. We specifically look at how gender and certification impact attitudes regarding flexible work schedules.

PRIOR RESEARCH

Gaertner and Ruhe (1981) mailed out a questionnaire similar to the one used for this study. It was sent out to 398 professionals at regional and national CPA firms in the Midwestern USA, and garnered 193 usable responses. According to Gaertner and Ruhe, many accountants reported heavy smoking and alcohol consumption, ulcers, chronic back pain and headaches as responses to stress (Gaertner & Ruhe, 1981, p. 68). Their results suggest that senior and junior staff accountants exhibit the highest levels of work-related stress. Senior accountants' stress was caused by uncertainty about future employment prospects, compensation inequity, unwanted overtime, and boredom. Junior staff accountants' stress resulted mostly from not being involved in decisions affecting their work assignments (Gaertner & Ruhe, 1981). Results did not differ greatly between regional and national firms.

Greenhaus and Beutell (1985) extended Gaetner and Ruhe's research by looking at work-family conflict. Greenhaus and Beutell found that conflict at work impacted behavior at home. Greenhaus and Beutell determined that work conflict is associated with the number of hours worked per week, the time spend commuting, the amount of overtime, and an inflexible work schedule. Family conflict comes about from specific family role characteristics that require time spent in family activities. When the job requirements are incompatible with family requirements, it creates a time-based conflict. Conflict-based pressures occur when the stressors of one role affects the performance in another role. Thus, time-based conflict consists of both work and family related conflicts, with job stress affecting how employees behave at home. Similarly, family related conflict that results when there is excessive strain at home and can affect how employees perform at work.

Subsequent research across various areas of accounting seems to validate the findings of Gaertner and Ruhe (1981) and Grennhaus and Beutell (1985); stress and the work environment in accounting often create situations that lead to employee dissatisfaction and turnover (e.g., Choo, 1986; Collins and Killough, 1992; Dalton et al., 1997; Fisher, 2001; Fogarty et al., 2000; Kelly and

Margheim, 1990; Rebele et al., 1996; Sanders et al., 1995; Snead and Harrell, 1991; Viator, 2001; Weick, 1983). It appears that the phenomenon known as "job burnout" may be at the core of such employee dissatisfaction and turnover

Sweeney and Summers (2002) distinguish job burnout by three components: emotional exhaustion, depersonalization and reduced personal accomplishment. Sweeney and Summers (2002) conducted a study based on this three-component model to measure role stressors and job burnout. In their study, they explain that emotional exhaustion is the first sign of job burnout, and is created by higher levels of work demand. Emotional exhaustion is followed by depersonalization, which occurs when the employee starts becoming emotional detached from clients and co-workers. The last of the components is a reduced sense of personal accomplishment, caused by a negative attitude about the job.

Sweeney and Summers (2002) results showed no direct relationship between burnout and the workload prior to an accountants' busy season when hours were just beginning to increase. The average workload during that time was forty-nine hours per week. They did, however, show a direct increase in burnout among public accountants during the busy season when the workload increased to approximately sixty-three hours per week. Sweeney and Summers also discovered a high level of emotional exhaustion at the end of the busy season, which is considered a key component in job burnout.

One answer to the problems of job burnout and work-family conflict is for CPA firms to offer flexible work arrangements. Flexible schedules are already becoming a major incentive in recruiting. Studies show a higher job satisfaction and lower turnover among those firms offering flexible hours (Almer & Kaplan, 2002). Flexible work hours may also help alleviate work-family conflicts. Padgett et al. (2005) found in a survey of 118 professionals who had worked in public accounting that a flexible schedule may be more important than the number of hours worked. They found that flexible schedules reduced stress by allowing employees to manage their own schedules, thus improving job satisfaction (Padgett et al., 2005).

HYPOTHESES

Stress, job burnout, and work-family conflict in accounting likely impacts female accountants differently than male accountants. Scheuermann et al. (1998) found that women often leave public accounting because of work stress and burnout. Scheuermann et al. conclude in their analysis, "It appears that many of these problems are gender specific and are the cause of these women's stress" (p. 38). They based this conclusion on written comments from the respondents. Similar studies also suggested that women leave public accounting sooner than men (Padgett et al., 2005).

The works of Meyers-Levy (1988) and Meyers-Levy and Sternthal (1991) on gender differences suggest that gender roles impact employee satisfaction. Their research suggests that males are more *agentic* (masterful) and forcefully follow goals having immediate personal

consequences. Females, however, are more communal and focus on harmonious relationships. Females are also more likely to consider family harmony as the most important goal while males are more sensitive to self-relevant information.

Thus, based on prior gender research, we hypothesize that:

H1: Female accountants are more likely than males to have considered accepting compensation reductions in exchange for reduced work hours.

Stress also plays an important role in employee satisfaction. Prior research indicates that higher stress levels result in higher employee dissatisfaction and turnover (e.g., Choo, 1986; Collins and Killough, 1992; Fisher, 2001; Fogarty et al., 2000; Viator, 2001). Although these studies often looked at hours worked, salary levels, and job environments, they did not consider how certification can impact desires for flexible programs. Certified accountants are normally assigned greater responsibilities in their work environments and are thus more likely to encounter stressful situations than noncertified accountants. To investigate this certification-satisfaction association, we hypothesize that:

H2: Certified accountants are more likely than noncertified accountants to have considered accepting compensation reductions in exchange for reduced work hours.

SUBJECTS

Members of the Nashville, Tennessee chapter of the Institute of Management Accountants and employees of the Nashville branch of a major CPA firm agreed to participate in our study. Two hundred questionnaires were sent to potential subjects, and of those, 114 were returned (a response rate of fifty-seven percent). Four surveys were removed from the sample because the subjects were either retired or not in the accounting profession. One additional response was deleted because of missing data. These deletions left 109 usable survey responses.

Our survey was similar to that of Gaertner & Ruhe (1981) and contained thirteen questions. The survey asked basic demographic and job information such as: (1) job title, gender, years experience, salary level, education level, average hours subject works per week, marital status, number of children, age, and spouse's occupation. In addition to the above information, the survey also asked if the subjects had ever considered taking a pay cut in order to decrease the number of hours worked per week, and if they had considered taking a pay cut, what percentage reduction would they accept?

Table 1: Demographics					
Position:	Owner/Partner	7%	Certification:	CPA	48%
	CFO	7%		CMA	14%
	Manager	32%		No certification	38%
	Controller	18%		Both CPA and CMA	7%
	Senior	10%			
	Staff	13%			
	Finance	5%			
	Misc.	8%			
Experience:	1-5 years	21%	Salary Level:	$30,000-$45,000	11%
	6-10 years	14%		$45,000-$60,000	21%
	11-15 years	9%		$60,000-$75,000	17%
	over 15 years	56%		$75,000-$90,000	18%
				$90,000+	32%
				No response	1%
Gender:	Female	36%	Highest Level of Education	PhD	1%
	Male	64%		Masters	36%
				Bachelors	59%
				Associates	3%
				High School Diploma	1%

Table 1 provides demographic information on the respondents. It shows that there is a good representation among the various demographics. Most of the respondents were certified, with forty-eight percent possessing a CPA license, fourteen percent possessing a CMA license, and seven percent possessing both. Most of the respondents had over fifteen years of experience, while the salary levels were somewhat concentrated in the higher levels (fifty percent of the subjects had incomes of $70,000 or higher). The respondents were a highly education group of professional, with ninety-six percent possessing a Bachelors degree or higher. The gender demographics of the sample were as expected, with sixty-four percent of the sample being male. These gender numbers should be sufficient for running the models to test the hypotheses in this study.

METHODOLOGY

Dependent (Response) and Independent Variables

We developed three log-linear models to test our hypotheses. The dependent variable in this study was a dichotomous indicator variable coded as:

CUT = 0, if the subject has not considered accepting a reduction in compensation in order to decrease the number of hours worked per week, or
1, if the subject has considered accepting a reduction in compensation in order to decrease the number of hours worked per week.

Seven control variables and two variables of interest made up the independent variables. The main two independent variables of interest are subject gender and certification coded as:

GENDER = 0, if subject was male, or
1, if subject was female;
CERTI = 0, if subject was not certified, or
1, if subject was certified as either a CMA or CPA.

These two variables were the main variables of interest used to test the hypotheses. We also looked at three partitions of CERTI: not certified, CMA certified, CPA certified, or both CMA and CPA certified. The results (not reported) were similar to that of the dichotomous measure.

Additional independent variables were included in our model to control for work experience, education, average hours worked per week, marital status, number of children in the household, age, and salary. These variables were important to control for information that may explain why an employee would accept a reduction in compensation in order to decrease the number of hours worked per week. The control variables are:

EXPER = years of work experience;
ED = 0 , if subject has less than a four year college degree,
1, if subject has a four year college degree, or
2, if subject also has a Masters or higher degree;
HOURS = average number of hours the subject works per week;
MARITAL = 0, if subject is not married, or
1, if subject is married;
NO_CHILD = number of children the subject has in his/her household;
AGE = age;
SALARY = 0, if subject's current annual salary is less than $45,000,

1. if subject's current annual salary is between $45,000 and $60,000,
2, if subject's current annual salary is between $60,000 and $75,000,
3, if subject's current annual salary is between $75,000 and $90,000, and
4, if subject's current annual salary is over $90,000;

Log-linear Modeling Using Nominal Logistic Regression

The log-linear models were constructed using logistic regression. This study employed proportional odds to generate the models (see, for example, Agresti, 1984 for a discussion of various logistic regression models.). This procedure fits a parallel lines regression model based on transformed cumulative logits and has been used extensively in the past, especially in research regarding financial distress (e.g., Casey and Bartczak, 1985; Gentry et al., 1985; 1987; Aziz et al., 1988; Aziz and Lawson, 1989; Kennedy, 1992; Ward, 1992; 1994; 1999; 2006**)**. Hosmer and Lemeshow (1989) provide a thorough discussion of binary logit regression.

In prior distress studies, the independent variables were normally either continuous or dichotomous variables. For this study, two of the independent control variables (ED and SALARY) have more than two categories or levels. For these variables, nominal logistic regression will create multiple parameter estimates and test statistics to determine the differences between each two levels of the independent variable across the dependent variable. For example, ED will have two parameter estimates and SALARY will have four.

RESULTS

Incremental Value of GENDER and CERTI

We first ran the following base model: CUT = EXPER + ED + HOURS + MARITAL + NO_CHILD + AGE + SALARY. Then, each of the two variables of interest, GENDER and CERTI, were added separately to the base model to determine whether either variable has incremental value beyond that of the control variables. Results of these regressions are reported in Table 2.

Table 2: Multiple Models: Base Model of Control Variables with Each Variable of Interest Added Separately

	Base Model Parameter		Base Model with GENDER Variable Parameter		Base Model with CERTI Variable Parameter	
Variables	Estimates	Wald χ^2	Estimates	Wald χ^2	Estimates	Wald χ^2
Intercept	-2.615	2.248	-2.599	0.875	-2.477	1.200

Table 2: Multiple Models: Base Model of Control Variables with Each Variable of Interest Added Separately

	Base Model Parameter		Base Model with GENDER Variable Parameter		Base Model with CERTI Variable Parameter	
Variables	Estimates	Wald χ^2	Estimates	Wald χ^2	Estimates	Wald χ^2
EXPER	-0.119	0.167	-0.019	0.004	-0.079	0.068
ED 0 vs. 2	0.670	0.710	1.206	1.844	0.485	0.303
ED 1 vs. 2	-0.113	0.058	-0.422	0.736	-0.149	0.095
HOURS	0.086	4.142**	0.083	3.289*	0.080	3.636**
MARITAL	-0.359	0.345	-0.575	0.801	-0.256	0.169
NO_CHILD	-0.056	0.066	-0.168	0.535	-0.066	0.086
AGE	0.383	0.882	0.329	0.618	0.370	0.804
SALARY 0 vs. 4	1.414	2.232	1.691	2.640	1.141	1.321
SALARY 1 vs. 4	-0.023	0.002	0.079	0.020	-0.199	0.130
SALARY 2 vs. 4	-0.539	0.270	-0.412	0.627	-0.433	0.743
SALARY 3 vs. 4	-0.904	3.301*	-1.117	4.312**	-0.802	2.455
GENDER			0.757	7.963***		
CERTI					0.466	2.813*
Model -2Log Likelihood	15.624 (11df)		24.255** (12df)		18.567* (12df)	
Δ in -2Log Likelihood	N/A		8.631*** (1df)		2.943** (1df)	

The base model includes the control variables EXPER, ED, HOURS, MARITAL, NO_CHILD, AGE, and SALARY regressed on CUT. CUT = whether a subject considered a pay cut for reduced work hours, coded 0 if subject did not consider taking a pay cut and 1 if subject considered taking a pay cut. EXPER = years of experience for subject. ED = level of education with three levels; coded 0 if subject did not have a college degree, coded 1 if subject had a Bachelors degree, and coded 2 if subject had a Masters or higher degree. HOURS = number of hours, on average, that subject worked each week. MARITAL = whether subject was married with two levels, coded 0 if subject was not married and coded 1 if subject was married. NO_CHILD = number of children subject had. AGE = age of subject. SALARY = annual salary of subject with five levels; coded 0 for incomes between $30,000 to $45,000, coded 1 for incomes between $45,000 and $60,000, coded 2 for incomes between $60,000 and $75,000, coded 3 for incomes between $75,000 and $90,000, and coded 4 for incomes over $90,000.

Each variable of interest, GENDER and CERTI, was added individually to the Base Model to determine whether each variable has incremental usefulness over the base control variables. GENDER = gender of subject with two levels, coded 0 for males and 1 for females. CERTI = whether subject is certified with two levels, coded 0 if subject is not certified and 1 if subject has certification (CPA or CMA).

The Wald χ^2 (two degrees of freedom for ED, four degrees of freedom for SALARY, and one degree of freedom for each of the remaining independent variables) tests the significance of each individual variable, while the -2Log Likelihood tests the predictive significance of the overall model.

Change in -2Log Likelihood = the change in the -2Log Likelihood statistic from the Base Model to the Added Model with GENDER, CERTI, or SALARY added to the Base Model. A significant Change in -2Log Likelihood chi-square indicates that the added variable has incremental usefulness over the accounting information measured by the control variables. Since the hypotheses are based on directional tests, the tests are a one-tailed test for the two variables of interest using the Change in -2Log Likelihood Statistic.

*** Significant at p-value $\leq$ .01. ** Significant at p-value $\leq$ .05. * Significant at p-value $\leq$ .10.

The results for the Base Model indicate that only the number of hours worked (HOURS) is a strong predictor of subjects having considered a pay cut in exchange for reduced work hours (at

p-value < .05). As expected, the sign of the parameter estimate for HOURS is positive, indicating that the more hours the accountant worked per week, the more likely he/she would consider a pay cut in exchange for reduced hours. The signs of the coefficients on the four comparisons across levels of SALARY reveal an interesting result. The signs on the parameter estimates for SALARY switch from positive to negative across the various levels, indicating that after the accountant earns a certain minimum salary per year ($45,000 for this study), the more money the accountant makes the less likely he/she is willing to take a pay cut for reduced work hours. The parameter estimate for SALARY for the comparisons between the third and fourth categories (between incomes of $75,000 to $90,000 and over $90,000) indicates a limited negative significant difference (at p-value < .10). Thus, this negative relationship becomes significant for incomes over $90,000.

The most likely explanation for this income relationship is a function of necessity and a lessening of stress (or more control over stressful situations) at more senior levels of employment. The authors looked at correlations and frequency totals between pay cut, job rank, and experience. As expected, job rank and experience were highly correlated (p-value < .001). The frequency totals (not reported) showed that employees with less experience making lower salaries did not consider a pay cut. Accountants in the middle ranks, salaries, and experience often considered taking a pay cut for reduced work hours. Thus, once a desired minimum salary is obtained by the accountant, he/she appears to more willing to take a pay cut for less stress.

However, the trend reverses at the highest rank, pay level, and experience. Accountants at the highest ranks seldom considered a pay cut for reduced work loads. Apparently, accountants at the highest ranks either have less stress than those at lower ranks or have greater control over stressful situations. This result is not surprising since high level employees have more input into their work schedules and would tend to have greater abilities to control stressful situations.

Our two variables of interest, GENDER and CERTI, were added separately to the base model to test whether gender and certification significantly impact an employee's decision to accept a pay cut for reduced work hours. The Change in -2Log Likelihood statistic was calculated to measure the incremental contribution of each variable to the log-linear models. The test is a one-tailed test since we anticipate a directional effect; specifically, a positive relationship between the two variables and CUT.

The second model in Table 2 includes GENDER as an independent variable. When GENDER is included in the model, the Change in -2Log Likelihood statistic of 8.631 is highly significant (p-value < .01). The sign of the parameter estimate indicates that females are significantly more likely to have considered accepting a pay cut for reduced work hours (flexible work plan) than are males. This result is consistent with prior research suggesting females are more likely to consider family harmony, while males are more sensitive to self-relevant information. This result also may help explain why females tend to leave the accounting profession at a higher rate than males. Flexible work schedules are likely more appealing to female accountants than to male accountants.

Thus, we fail to reject H1. After controlling for experience, education hours worked, marital status, number of children, age, and level of salary, female accountants are more likely than males to accept pay cuts for reduced work hours (flexible work plan).

The final model in Table 2 contains CERTI added to the base model. Although the results for certification are not as strong as the results for GENDER, the Change in -2Log Likelihood statistic of 2.943 is still significant at conventional levels (p-value < .05). The sign of the parameter estimate is, as expected, positive.

This result may appear counterintuitive, but it is consistent with prior stress research. Certified accountants have greater responsibilities and stress related duties than noncertified accountants. Thus, working long hours in stressful situations would likely lead to a greater desire for more flexible work schedules. After controlling for other basic variables, certified accountants are more likely than noncertified accountants to have considered pay cuts in exchange for reduced work hours. Thus, we fail to reject H2.

Full Model

GENDER and CERTI could be surrogate variables measuring the same construct. Thus, a full model including all variables was tested. The results for the full model are reported in Table 3.

Table 3: Full Model with all Independent Variables Together

Variables	Parameter Estimates	Standard Error	Wald χ^2
Intercept	-2.094	2.466	0.721
EXPER	0.087	0.323	0.072
ED 0 vs. 2	0.971	0.926	1.100
ED 1 vs. 2	-0.352	0.507	0.481
HOURS	0.077	0.047	2.733*
MARITAL	-0.457	0.657	0.483
NO_CHILD	-0.192	0.231	0.688
AGE	0.314	0.429	0.535
SALARY 0 vs. 4	1.481	1.143	1.677
SALARY 1 vs. 4	-0.191	0.591	0.104
SALARY 2 vs. 4	-0.280	0.544	0.266
SALARY 3 vs. 4	-1.034	0.559	3.412*
GENDER	0.810	0.277	8.552***
CERTI	0.572	0.306	3.481*
Model -2Log Likelihood			27.995 (13df) ***

All variables and statistics are as described in Table 2.
*** Significant at p-value ≤ .01. ** Significant at p-value ≤ .05. * Significant at p-value ≤ .10.

Although one would expect the results for the full model to be somewhat weaker than those for the incremental models (the results for the full model are likely to be impacted by collinearity), the results for the Wald Chi-Square statistics should be similar to those for the Change in -2Log Likelihood reported earlier.

The results for the full model are consistent with the incremental models. Both GENDER and CERTI are significant, but GENDER is the stronger predictor variable. The signs for both are positive as expected, indicating that GENDER and CERTI are positively related with CUT.

Contingency Tables

Two-way Contingency Tables were developed to investigate the relationship between the two variables of interest and CUT. Panel 1 of Table 4 contains the GENDER by CUT contingency table results, while Panel 2 of Table 4 contains the CERTI by CUT contingency table results. The first number in each cell (y_{ii}) represents the observed number of observations for that cell, while the second in each cell (m_{ii}) represents the number of observations one would expect by chance.

Table 4: Two-Way Contingency Tables

Panel 1, GENDER by CUT Contingency Table

		GENDER				Totals
		Male		Female		
CUT	No pay cut	y_{11}	55	y_{12}	16	71 y_{1+}
		m_{11}	48.20	m_{12}	22.79	
	Pay cut	y_{21}	19	y_{22}	19	38 y_{2+}
		m_{21}	25.79	m_{22}	12.20	
	Totals	y_{+1}	74	y_{+2}	35	109 n
Pearson χ^2 = 8.564 (p-value = .00, with 1df)						

Panel 2, GENDER by CERTI Contingency Table

		CERTI				
		Not		Yes		Totals
CUT	No Pay Cut	y_{11}	34	y_{12}	40	74 y_{1+}
		m_{11}	28.51	m_{12}	45.48	
	Pay Cut	y_{21}	8	y_{22}	27	35 y_{2+}
		m_{21}	13.48	m_{22}	21.51	
	Totals	y_{+1}	42	y_{+2}	67	109 n
Pearson χ^2 = 5.648 (p-value = .02, with 1df)						

CUT	= whether a subject considered a pay cut for reduced work hours, coded 0 if subject did not consider taking a pay cut and 1 if subject considered taking a pay cut.
GENDER	= gender of subject with two levels, coded 0 for males and 1 for females.
CERTI	= whether subject is certified with two levels, coded 0 if subject is not certified and 1 if subject has certification (CPA or CMA).

$$\text{Pearson } \chi^2 = \sum_{i=1}^{4} [(y_{ii} - m_{ii})^2/m_{ii}] ,$$

where y_{ii} is the observed count and m_{ii} is the expected or estimated count, calculated as $m_{ii} = [(y_{+i}) (y_{i+})] \div n$.

The GENDER by CUT contingency table results show that, as expected, a strong relationship exists between GENDER and CUT (the Pearson χ^2 is significant at a p-value < .01). The cells show that nineteen out of the thirty-five females (over 54%) had considered a pay cut in exchange for reduced work hours, while only nineteen of the seventy-four males (less than 26%) had done so.

The results for the CERTI by CUT contingency table are similar (Pearson χ^2 significant at p-value < .02). In this case, twenty-seven out of sixty seven certified accountants (40%) had considered a pay cut in exchange for reduced work hours, while only eight out of forty-two (19%) of the noncertified accountants had done so.

Thus, the results for the contingency tables are consistent with the hypotheses and agree with the log-linear models. Females and certified accountants are significantly more likely to have considered a pay cut for reduced work loads (flexible work schedule) than males and noncertified accountants. These results are consistent after controlling for various demographic attributes (log-linear models) and when looking at one-way relationships (contingency tables).

CONCLUSIONS

The issue of work loads, employee turnover, and flexible work schedules are very important issues facing the accounting profession. Past research suggests that accountants have high turnover and employers have a difficult time keeping female accountants. The results of this study provide empirical evidence concerning the attributes that may help explain which employees would desire flexible work schedules (a willingness to take a pay cut for a reduced work schedule).

The results of this study suggest that gender and certification status of the accountant impacts his/her desire for a flexible schedule. Female accountants are significantly more likely to desire a flexible schedule than males. Employers need to consider that the goals and ambitions of female accountants may be more inherent in nature than those of male accountants.

This study's results also suggest that certified accountants are more likely to desire pay cuts for reduced work loads than noncertified accountants. The authors are unaware of prior research suggesting this relationship. This result suggests that employers should be careful concerning work loads and expectations of its certified accountants. Failure of a company to create an equitable work

environment for certified accountants will more likely result in an increased probability of losing its most qualified accountants. Apparently, income is not the only thing important to certified accountants.

The subjects used in this study are from the Middle Tennessee area (Nashville and surrounding counties). The results for this study may be geographic specific and not applicable to other areas of the country. Thus, the external validity of this research may be limited.

There has been much research concerning the working conditions in the accounting profession but little to address how individual and family attributes can impact work variables such as efficiency, satisfaction, etc. Further empirical research may be warranted concerning the family structures of accountants and how they impact work related issues such as flexible scheduling.

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THE WAL-MART EFFECT ON THE SECURITIES MARKET

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ABSTRACT

In the history of retail sales, no corporation has had as profound an impact on consumer spending across the United States as has Wal-Mart. In 2006, Charles Fishman wrote the eye-opening book, 'The Wal-Mart Effect.' This book describes how Wal-Mart has changed the landscape in retail trade along with both good and bad effects brought about by its rise to the powerful position it now commands. Mr. Fishman's book stops short in analyzing the impact Wal-Mart has had in the securities market. This research tests whether or not there is a "Wal-Mart Effect" in the securities market. Research from the most recent four decades among firms in retail trade indicates that Wal-Mart does have a distinct advantage over its competitors when it comes to wealth generation and its link to security prices. This finding has practical implications on patterns of future investment among current and future security investors.

INTRODUCTION

As far back as the original Ball and Brown (1968) study, there have been a multitude of studies that empirically link unexpected earnings with security prices. What makes it difficult to apply this standard to Wal-Mart is the fact that since 1972, the firm has had eleven 100% stock splits, more than any U.S. firm in history. To assess unexpected earnings accurately to Wal-Mart stock prices, one would have to control for the effect of earnings and associated stock splits throughout its history. For instance, Wal-Mart stock price has ranged from less than $30 to greater than $80 per share, many of the swings, stock split induced. To date, no practical attempt has been made to control for this factor.

Recent research on equity valuation has focused on ratios. Nissim and Penman (2001) find cross-sectional correlation between financial ratios and equity prices. Penman and Zhang (2005) find that Price/Earnings and Book Value ratios provide greater persistence than earnings when correlating to equity prices, while Nissim and Penman (2005) indicate that financial ratios may be viewed as a building block to analyze future equity payoffs. As a result, this study will attempt to proxy "wealth" for unexpected earnings and then link that measure to security prices in attempt to ascertain if there is any correlation between a wealth measure and security prices, and if Wal-Mart has any advantage when this measure is assessed. While unexpected earnings are time specific (i.e., quarterly or annual), they are less adaptable to such things as stock splits. Ratios are more elastic and are better adapted to measuring such swings. Therefore, the wealth measure that will be used

in this study is Book Value Per Share (defined as total common equity divided by number of common shares outstanding).

RESEARCH DESIGN

This study will focus on comparing Wal-Mart to firms in the retail trade industry, specifically, those that fall into SIC code 5311. Because Wal-Mart has undergone transitional phases since it began trading on the New York Stock Exchange in August of 1972, an attempt will be made to associate Wal-Mart's comparison to its competitors by decade. For instance, the following phases can be identified with Wal-Mart's growth:

1970s- Introduction into retail trade
1980s- Regional growth
1990s- Nation-wide growth
2000s- Global growth and market maturity

During the 1970s Wal-Mart's growth was somewhat slow and confined to areas in and around its home base of Rogers, Arkansas. The 1980s saw tremendous growth of Wal-Mart in the Southeast region of the United States, while the 1990s was typified by unprecedented coast to coast expansion of Wal-Mart stores with greater expansion into food and drugs. The 2000s have thus far seen Wal-Mart slow in growth of new stores while expanding into the International market. Because of the changing nature of Wal-Mart over these four decades, they become four distinct time frames in which to assess the firm in comparison to its competition.

A cross-sectional sample of firms was derived for each decade. For this sample, quarterly book values per share were derived from Compustat (i.e., proxy for wealth). Security price data was obtained from the Center for Research on Security Prices (CRSP). Information content of the cross-sectional sample of firms' wealth to security prices was then assessed against that of Wal-Mart for the respective decades. Table 1 provides a summary of firms in the cross-sectional analysis by decade.

Table 1: Study Sample Summary

Study Periods	Avg. No. of Firms	Avg. No. of Firm Qtrs.
1973-1979	85	340
1980-1989	92	368
1990-1999	98	392
2000-2006	109	436

HYPOTHESIS DEVELOPMENT

If book value per share, the proxy for wealth, is not perceived to have greater influence on Wal-Mart stock prices than the same wealth proxy would have on stock prices for the rest of the firms in the retail trade industry, then there should be no significant difference between the two groups. If, on the other hand, there is significant difference, it may inferred that Wal-Mart's wealth measure is more/less influential in determining future stock prices. These alternative notions suggest the following null hypothesis:

Ho: The information content of book value per share (wealth measure) for Wal-Mart is equal to the book value per share (wealth measure) for all other retail trade firms for the past four decades.

TEST OF HYPOTHESIS

The purpose of this test is to assess the relative information content of the firm's book value (wealth) to security prices of the firm. Quarterly financial data, which would also contain information for determining book value, is typically released by each publicly held firm within two weeks following the close of the quarter. Based on this information, stock traders respond along with the stock price itself. Heretofore, the prime belief was that earnings, more specifically, "unexpected earnings" was causing the stock price to move. But what if there are influences that go beyond unexpected earnings, such as a firm with a history of unprecedented number of stock splits? Might a wealth measure, such as book value per share, be able to capture any correlation with future stock price? The Dow Jones News Retrieval Service (DJNRS) was used to identify the date that each firm released quarterly financial data for the study periods. This date of data release is known as the event date. The following model is established for determining information content:

$$CAR_{it} = a + b_1W_{it} + b_2UE_{it} + b_3B_{it} + b_4MV_{it} + e_{it}$$

Where:

CAR_{it} = Cumulative abnormal return firm i, time t
a = Intercept term
W_{it} = Wealth measure proxied by book value per share for firm i, time t
UE_{it} = Unexpected earnings for firm i, time t
B_{it} = Market model slope coefficient as proxy for systematic risk
MV_{it} = Market value of equity as proxy for firm size
e_{it} = error term for firm i, time t

The coefficient "a" measures the intercept. The coefficient b_1 is the response coefficient for measuring the effect of book value (wealth) on security prices. The coefficient b_2 is the traditional earnings response coefficient (ERC), found to have correlation with security prices in traditional market based studies. The coefficients b_3 and b_4 are contributions to the ERC . To investigate the effect of information content on security prices, there must be some control for variables found in prior studies to be determinants of information content. For this reason, variables b_3, representing systematic risk, and b_4, representing firm size are included as controls in the study.

Unexpected earnings (UE_i) is measured as the difference between the management earnings forecast (MF_i) and security market participants' expectations for earnings proxied by consensus analyst following as per Investment Brokers Estimate Service (IBES) (EX_i). The unexpected earnings are scaled by the firm's stock price (P_i) 180 days prior to the forecast:

$$UE_i = \frac{(MF_i) - (_{Exi})}{P_i}$$

For each firm sample, an abnormal return (AR_{it}) is generated around the event dates of -1, 0, +1 (day 0 representing the day that the firm's financials were available per DJNRS). The market model is utilized along with the CRSP equally-weighted market index and regression parameters are established between -290 and -91. Abnormal returns are then summed to calculate a cross-sectional cumulative abnormal return (CAR_{it}). Two regressions, similar to the one above, are run for each decade under review. One for only Wal-Mart data, and one for all other firms in the same retail trade industry.

RESULTS

As indicated in Table 2, the coefficient representing the proxy for wealth, b_1, is significant for Wal-Mart in each represented decade. During the decade of the 1970s, this variable has a value of .14 with a p-value of .10, during the 1980s it has a value of .18 and a p-value of .01, in the 1990s the value is .16 with a p-value of .05, and lastly in the 2000s it has a value of .17 with a p-value of .10. This variable possesses its greatest significance during the decade of the 1980s. This coincides with the time frame in which Wal-Mart had the greatest number of stock splits. When the rest of the firms in the retail trade industry were analyzed, this wealth variable was not significant for these firms in any given decade. Table 2 also shows that the unexpected earnings variable, b_2, is significant with a p-value of .05 for both Wal-Mart and the rest of the retail trade industry in each decade studied. This result supports most past studies that link unexpected earnings to security prices. No other variables in the model were found to contain significance for either Wal-Mart or the other firms in the industry.

CONCLUSION

Recent Penman et al studies have shown ratios to have increasing importance in relation to security prices. This study has singled out one firm in retail trade, Wal-Mart, as being exceptional among all other firms with respect to the number of stock splits that it has had during its corporate life. Because of this, it was determined that perhaps, with respect to Wal-Mart, there might exist informational content relative to security prices, measured by other than unexpected earnings. Relying on past Penman studies, book value was used as a proxy for wealth. When book value was analyzed in regression form for Wal-Mart and other firms in the retail trade industry in a stratified sample by decade, this variable was found to be significant for Wal-Mart but not for the rest of the industry. These results have tremendous implications. For one, investors interested in firms that have a history of stock splits now may have another tool to assess when making stock purchase decisions. Also, in light of this and recent other studies relative to ratios and stock prices, researchers will want to explore this avenue for further application. And lastly, perhaps there is an unique Wal-Mart effect taking place due to its financial history, that may not be seen or replicated in other firms, only future research can substantiate or dismiss this.

Table 2: Test of Hypothesis

Model: $CAR_{it} = a + b_1W_{it} + b_2UE_{it} + b_3B_{it} + b_4MV_{it} + e_{it}$

Sample	a	b_1	b_2	b_3	b_4	Adj. R^2
1970s						
Wal-Mart	.22	.14	.10	.06	.02	.083
	(.89)	(1.66)[a]	(2.11)[b]	(.33)	(.49)	
All Other Firms	.30	.11	.09	.03	.01	.091
	(.67)	(.88)	(2.20)[b]	(.28)	(.37)	
1980s						
Wal-Mart	.15	.18	.14	.05	.01	.094
	(.77)	(2.68)[c]	(2.38)[b]	(.27)	(.41)	
All Other Firms	.19	.10	.12	.04	.02	.084
	(.46)	(.79)	(2.26)[b]	(.31)	(.26)	
1990s						
Wal-Mart	.23	.16	.15	.04	.02	.088
	(.81)	(2.30)[b]	(2.29)[b]	(.30)	(.44)	
All Other Firms	.20	.11	.17	.03	.02	.085
	(.52)	(.82)	(2.21)[b]	(.36)	(.29)	

Table 2: Test of Hypothesis

Model: $CAR_{it} = a + b_1W_{it} + b_2UE_{it} + b_3B_{it} + b_4MV_{it} + e_{it}$

Sample	a	b_1	b_2	b_3	b_4	Adj. R^2
2000s						
Wal-Mart	.19	.17	.12	.03	.01	.084
	(.76)	(1.80)[a]	(2.16)[b]	(.31)	(.45)	
All Other Firms	.24	.09	.14	.03	.02	.085
	(.48)	(.77)	(2.24)[b]	(.39)	(.31)	

[a] Significant at the .10 level
[b] Significant at the .05 level
[c] Significant at the .01 level

CAR_{it} = Cumulative abnormal return firm i, time t
a = Intercept term
W_{it} = Wealth measure proxied by book value per share for firm i, time t
UE_{it} = Unexpected earnings for firm i, time t
B_{it} = Market model slope coefficient as proxy for systematic risk
MV_{it} = Market value of equity as proxy for firm size
e_{it} = error term for firm i, time t

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ANALYZING CREDITWORHTINESS FROM FINANCIAL STATEMENTS IN THE PRESENCE OF OPERATING LEASES

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ABSTRACT

In 1976 the *Financial Accounting Standards Board (FASB) issued its now infamous Statement of Financial Accounting Standard No. 13 "Accounting for Leases", which provided new guidance for the accounting of various types of leasing arrangements. A significant component of this statement was the distinction made between "capital" leases and "operating" leases. A cottage industry soon arose that would design and structure leasing arrangements to meet the more favorable "operating" lease requirements. The success of these efforts was documented in a 2005 SEC staff study that showed some 96 percent ($1.25 trillion) of all future cash flow payments committed by U.S. corporations under leasing contracts is associated with operating leases. In present value terms this means that some $1 trillion in lease obligations is currently being unreported on the balance sheets of U.S. companies. The "success" (some would say abuse) of operating leases has led the SEC to recommend that the Financial Accounting Standards Board (FASB), in conjunction with the International Accounting Standards Board (IASB), to reconsider its accounting guidance for leases, a process that the FASB and IASB began undertaking in earnest in July 2006.*

It has become obvious that irregularities within lease accounting have become a critical issue when evaluating corporate financial statements, particularly those with large amounts of operating leases. Prior researchers, most notably Imhoff, Lipe, & Wright (1991, 1997), have examined different aspects of the impact that capitalizing operating leases would have on corporate financial statements. This paper examines how the current accounting treatment for operating leases, as well as the proposed changes, affects financial analysis, particularly with regards to the calculation of key financial ratios. A special focus is placed on various measures of a company's creditworthiness, particularly Altman's discriminant analysis model, or Z-score. Alternative methods for valuing operating leases are also examined.

INTRODUCTION

The leasing market in the U.S. is very large. Some estimates show that more than half of all public and private investment in equipment and software in the U.S. is currently being acquired

under leases (Equipment Finance and Leasing Foundation, 2007) with comparable results found in the acquisition and use of real estate assets, automobiles and airplanes, and many other tangible assets.

Leases are contractual obligations that allow assets owned by one party to be used by another party, for specified periods of time, in return for a payment or series of payments. Companies choose to lease assets for a variety of reasons, including economies of scale or scope, increased flexibility, tax advantages, improved access to capital, reduced costs of upgrading equipment, and improved risk sharing (SEC, 2005).

The accounting guidelines that pertain to leases are primarily dictated by Statement of Financial Accounting Standard 13 (SFAS 13) *Accounting for Leases*, which was issued in 1976. This statement provided a two-pronged approach to accounting for leases. Leases that transferred most of the benefits and responsibilities of ownership to the party using the asset would be treated as economically similar to sales with attached financing agreements, and generally referred to as "capital" leases. The user of the asset (the lessee) would record the asset and a related liability on its balance sheet in an amount estimated as the present value of the required lease payments with periodic write-offs incorporating the depreciation (amortization) of the asset, associated operating expenses such as property taxes, and the implicit financing charges.

Leases not considered capital leases were labeled "operating" leases and accounted for as rental contracts. The company using the asset would not record the asset or the related liability for future contractual rental payments on its balance sheet, but would instead record a periodic rental expense. SFAS 13 specified that a lease would be deemed a capital lease if 1) the lease transferred ownership to the lessee using the asset by the end of the lease term or through a bargain purchase option; 2) the term of the lease was at least 75 percent of the estimated economic life of the leased property; or 3) the present value of the minimum lease payments to be made by the lessee was at least 90 percent of the fair value of the leased asset. Leasing agreements that did not involve any of these requirements could be accounted for as operating leases.

Although the distinction made between capital leases and operating leases is usually straightforward, there are many issues such as contingent and variable payment requirements, optional term extensions, and other clauses that complicate the analysis. Nonetheless, such a distinction must be made to properly account for the transactions. Whether considered capital or operating leases, each still has extensive disclosure requirements. For example, companies must provide the following information: a description of the nature of leasing arrangements; the nature, timing and amount of cash flows associated with the leases; the amount of lease revenues and expenses reported in the income statement each period; and any additional information pertinent to the balance sheet classification of the various components of the leasing arrangements.

Unfortunately, the accounting guidance for leases has produced a situation in which similar transactions can receive different accounting treatment depending on very artificial distinctions. For example, a lease requiring payments equaling 89 percent of an asset's fair value would be treated as an operating lease while one with payments equaling 90 percent would be a capital lease, despite

the two arrangements being very similar from an economic perspective. Likewise, there are significant economic differences between a one-month lease and a 10-year lease for the use of a building, yet they would likely each have similar accounting requirements as both would likely qualify as operating leases.

Accordingly, companies have been able to take advantage of these artificial distinctions and structure leases that achieve a specific accounting treatment, whether as a capital or an operating lease. These companies have been aided in these endeavors by a large number of attorneys, accountants, lenders, etc., to the point where lease structuring to meet various accounting or tax goals has become an industry unto itself (SEC, 2005).

In partial response to this, the SEC conducted a study of the issue and found that some 63 percent of the total population of issuers of financial statements reported operating leases, and 22 percent reported capital leases. Their sample showed that the undiscounted sum of the future committed cash flows related to non-cancelable operating leases was approximately $206 billion, which, if extrapolated to the entire population of U.S. issuers, suggested that the total amount of cash flows committed to operating leases approached $1.25 trillion. Assuming these leases were instead capitalized, discounting the cash flows would likely reduce this amount to some 60 to 80 percent of the total. Thus, perhaps some $1 trillion dollars of lease obligations is currently being unreported on the balance sheets of U.S. companies.

The "success" (some would say abuse) of operating leases has led the SEC to recommend that the Financial Accounting Standards Board (FASB), in conjunction with the International Accounting Standards Board (IASB), to reconsider its accounting guidance for leases, a process that the FASB and IASB began undertaking in earnest in July 2006. Given the complexity of the issues surrounding lease accounting, this process is expected to take a considerable amount of time (a check of the websites for either organization can be made to see the current status of the project). Nonetheless, it is expected that many of the so-called operating leases of today will need to be accounted for more like capital leases in the future.

Of course, the level of importance placed on this underreporting of lease obligations is a matter for each individual user of financial information to determine. One particular area in which the issue may be especially critical is in assessing the credit standing of individual companies.

There is a plethora of approaches to assessing credit standing. Many of these are based to varying degrees on using a cross-section of financial and accounting ratios. For example, there are ratios (e.g., interest coverage and fixed charge coverage ratios) that look at a company's ability to generate income and/or cash flows to meet debt obligations. There are other ratios (e.g., debt and debt-equity ratios) that focus on the relative amount of outside (creditor) funding of a company's operations. In addition, there have been more sophisticated metrics and models developed that attempt to incorporate a wide array of data to provide insights into a company's creditworthiness and likelihood for it to experience financial distress.

The best known of these more sophisticated models is the Altman Z-score (Altman, 1968). Using multiple discriminant analysis on a variety of financial ratios, the model breaks down to a

simple weighted average of five specific accounting ratios (working capital, retained earnings, earnings before interest and taxes, and sales, each in relation to total assets, plus the ratio of market value of equity to book value of liabilities). The result is compared to arbitrary cutoff points indicating either a high or low probability of financial distress (i.e., bankruptcy).

Altman's model remains the standard against which most others are compared and tends to be the one most embraced by practitioners (IOMA, 2003), even though it is some 40 years old and has faced a constant barrage of criticism. Surprisingly, it continues to offer several advantages over more sophisticated models in both its simplicity and its effectiveness. Bellovary, Giacomino, & Akers (2006) discuss how broader and arguably more rigorous models generally do not improve upon simpler models like Altman's, which have stood the test of time. For the purposes of this study, we focus on the Altman model, and examine the impact that capitalizing operating leases (a likely outcome of the current revisions being discussed by the FASB and IASB) would have on that assessment.

Prior evaluations of the effects of capitalizing operating leases on a company's financial statements have generally been based on the seminal papers by Imhoff, Lipe, and Wright (1991, 1997). These typically involve reconstructing a company's financial statements in a manner in which the operating lease obligations reported as footnotes in the annual reports are capitalized following the methods employed for capital leases. This has potential implications for the reported values of both balance sheet and income statement items, and has been extensively examined in a variety of ways (Beattie, Edwards, & Goodacre, 1998; Hodge & Ahmen, 2003; Bennett & Bradbury, 2003; Fülbier, Silva & Pferdehirt, 2006; Noland, 2006). However, none of these papers focuses on the critical area of how credit analysis might be affected by changes brought about by capitalizing operating leases. Furthermore, none of these explicitly examines alternative methods that might be used to value the operating leases, a particularly crucial item in any assessment of the significance of said leases. This paper offers an examination of both topics.

DATA AND METHODOLOGY

Data for this study was gathered from Compustat (Research Insight). The primary sample, the one used to examine the impact of capitalizing operating leases on the Altman model and similar credit-focused metrics, includes all U.S. nonfinancial companies that reported in their most recent annual report some amount of operating lease obligations for each future lease period as required by SFAS 13. For purposes of comparability over time, such leasing data was also required for each of the four previous reporting periods. To eliminate some severely nonsensical ratio results, the companies included in the sample were also required to report positive amounts of both current liabilities and total equity. As a result, 595 companies were included in the primary sample.

In selecting and constructing variables for the study, several variables were found with extremely high or low values. For example, while the median value of the interest coverage ratio for the most recent year's results was 8.09, the maximum value was 24,247.5 and minimum value was

-2,430.0. Eliminating the influence of these extreme values provides us with an increase in statistical significance and explanatory power, an issue that is especially critical when evaluating financial ratios (Frecka & Hopwood, 1983). Therefore, in order to reduce the effect of outliers on our results, all dependent and independent variables were winsorized at the 5th and 95th percentiles. This resulted in much less extreme maximum and minimum values. For example, the resulting range of interest coverage ratios was reduced to a maximum value of 301.0 and a minimum value of -2.94. Although winsorizing also reduced the mean of the ratio from 101.46 to 35.65 and the standard deviation from 1047.6 to 75.5, the overall results of our study do not appear to be especially sensitive to winsorizing as the results proved to be similar in both qualitative and quantitative ways.

We examined a broad array of variables that are frequently used to assess the credit standing of individual companies, with a specific focus on the Altman model. These included:

Altman's Z-score, which itself is made up of five distinct ratios, and calculated as follows: $Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 0.999X_5$, *where* X_1 *is the ratio of net working capital to total assets,* X_2 *is the ratio of retained earnings to total assets,* X_3 *is the ratio of earnings before interest and taxes to total assets,* X_4 *is the ratio of the market value of total equity to the book value of total liabilities, and* X_5 *is the ratio of total sales to total assets. Generally speaking, the higher the Z-score, the lower the probability that the company would be expected to experience financial difficulties (e.g., bankruptcy), with 3.0 essentially being the threshold for considering companies to be of low risk, 1.8 considered the cut-off for high risk candidates, and with results between 1.8 and 3.0 representing a range of uncertainty.*

The current ratio, calculated as total current assets divided by total current liabilities.

The quick ratio, calculated as the total of cash, marketable securities, and receivables divided by total current liabilities.

The debt ratio, calculated as total liabilities divided by total assets.
The interest coverage ratio, calculated as total earnings before interest and tax expense (EBIT) divided by total interest expense. When expanding the definition to include other types of financing activities, the ratio is often adjusted and reformulated as a fixed charge coverage ratio. Unfortunately, this ratio is defined and measured in a wide variety of ways in practice. Here it is assumed to be a simple extension of the interest coverage ratio, incorporating (adding back) the assumed amount of financing incorporated in the current and future operating lease payments to both the numerator and denominator.

The assumed amount of financing embedded in operating lease payments was determined based on an estimate of the present value of all current and future operating lease payment obligations of the company. The present value of these lease payments was calculated using a discount rate of six percent. (Other discount rates up to 10 percent were examined with little impact on the final results). The resulting "present value of operating leases" (PVOL) was assumed to represent the additional amount of lease assets and liabilities that would be reported on the balance sheet IF the operating leases were valued and reported similar to the methods used for capital leases. Note: Because operating lease commitments beyond five years into the future are presented in a lump-sum, a method of valuing these payments had to be developed. This was accomplished by converting the "after five year" amount to an annuity with a duration equal to the number of periods needed to equate that amount given payment amounts equal to the fifth year's obligation, or 10 years, whichever was shorter. The resulting PVOL figure was multiplied by six percent to arrive at the current amount of financing (interest expense) assumed to be incorporated in the operating lease payments.

Other researchers include different items in their definitions of additional fixed charges to be included in the ratio. Two common techniques involve either assuming that all of the current lease payments (not only the financing component) were "fixed charges" or a "rule-of-thumb" approach of considering one-third of the current payment to be a proxy for the total financing inherent in all current and future operating lease obligations. These two alternative formulations are also examined.

*EBITDA (*earnings before interest, taxes, depreciation, and amortization) coverage ratio, calculated like the interest coverage ratio, but adding back the amount of depreciation and amortization expense to the numerator. EBITDA is often used as a "quick and dirty" cash flow proxy.

ROIC (return on invested capital), defined as earnings before interest and taxes (EBIT) valued on an after-tax basis divided by the sum of total debt and total equity, with debt referring to external financial commitments of the company rather than total liabilities. Return ratios such as ROIC are not necessarily evaluated as credit assessment variables on their own but ROIC is included here to try to capture the

impact that capitalizing operating leases would have on both the income statement (EBIT) and the balance sheet (total debt).

Capitalizing operating leases as if they were capital leases can have very profound effects on the analysis of financial statements and their associated ratios. To begin with, it impacts both sides of the balance sheet. The present value of the operating lease obligations (PVOL) can be regarded as additional liabilities to be reported on the balance sheet. Given the accounting identity, the total increase in liabilities would then need to be offset by an equal amount of assets, if one assumes the PVOL equaled the economic value of using those assets over time. However, this association is rarely one-to-one given the exponential features of present value calculations vis-à-vis the linear features of straight-line depreciation often assumed for long-term assets. This results in an asset valuation that is on average less than the corresponding liability valuation. This difference, although varying across time and discount rate assumptions, is often assumed to average around 75 percent; that is, the average value of the capitalized assets is 75 percent of the value of the capitalized liabilities (Imhoff, Lipe, & Wright, 1991).

Reducing the value of the left-hand side of the balance sheet by 25 percent, we need corresponding adjustments to the right-hand side. Following Imhoff, Lipe & Wright (1997) the 25 percent valuation reduction can be allocated into two components. The remaining value not considered as a liability could be accounted for as a reduction in equity. However, given the tax consequences of deductible lease expenses, it would be logical to assign the difference between the tax effect (a separate liability from the lease obligations themselves) and the residual impact on equity (retained earnings). To demonstrate, assume the present value of lease obligations was $100 million for a firm with a tax rate of 40 percent. If $75 million is the assumed value of the assets, the $25 million reduction on the right-hand of the balance sheet could be assigned as a reduction in equity of $15 million ($25 x (1 - 0.40) and a reduction in tax liabilities of $10 million ($25 x 0.40). Refinements might also be necessary to separate the current and noncurrent nature of the operating lease obligations and concomitant tax implications. This adjustment was made as follows: the additional current liabilities (operating lease payment and taxes) would be equal to the total lease obligation due in the subsequent year, less the amount of taxes deferred beyond the first year based on the proportion of lease obligations in the first year to the overall PVOL. Any remaining amounts could then be considered as noncurrent lease and tax obligations.

These adjustments result in numerous changes to variables used in calculating various ratios used in the analysis of financial statements. For example, any ratio involving current liabilities would need to be adjusted as the amount of current liabilities would now also include assumptions about the short-term lease payments and associated tax liabilities. Similarly, ratios incorporating *total* liabilities or total equity would face similar adjustments. And on the asset side, ratios involving *total* assets would need to be adjusted to take into account the value of the leased assets. Current assets would typically not be adjusted since leased assets would likely be classified as capital assets

and fall under a noncurrent time horizon. A case might be made about the prepaid rental value of lease agreements being considered as current assets but we have made no such assumption here.

Similar adjustments from capitalizing operating leases would be necessary for various income statement items. This would primarily result in reclassifying lease rental expenses into depreciation and interest expense components. Although net profit numbers and their respective ratios would be relatively stable (some minor shifting may occur from period to period), financial ratios involving other profit figures like EBIT or EBITDA used in various financial coverage ratios, may face significant adjustments.

For relatively complex variable such as Altman's Z-score, we see that capitalizing operating leases could have a dramatic and complex impact. For example, four of the variables include total assets in their denominators, which would result in lower ratio figures, given the assumed increased amount of assets. In addition, the first variable, net working capital to total assets, would also be affected as the numerator (and hence the overall value) would be further reduced by the assumed increase in current liabilities. The second variable, retained earnings to total assets, would face a similar fate due to the assumed reduction of retained earnings. The third variable, EBIT to total assets, would be affected as operating expenses are shifted to financing expenses, likely increasing the value of the numerator. The fourth variable, market value of equity to book value of liabilities, would likely decrease given the increased amount of liabilities and the assumption that a company's stock price would be unaffected by the capitalization of operating leases. However, this may not be the case if the company's stock value would be affected by the increased amount of leverage apparent from capitalizing the operating leases.

We tested several aspects of the potential impact that capitalizing operating leases would have on various financial ratios often used to evaluate a company's credit standing. We began by examining the individual ratios, both as calculated from the original financial statement data and then after making the necessary adjustments associated with capitalizing operating leases. Given its prominence in credit analysis, we specifically focused on Altman's Z-score to determine how it might be affected by capitalizing operating leases, particularly among companies with significant amounts of those types of leases reported in its financial statements.

RESULTS

Our sample consisted of 595 companies that: 1) reported operating lease obligations for each future period as required by SFAS 13, and reported such items for each of the five most recent reporting periods; and 2) reported positive amounts of current liabilities and total equity for each of the five period. The sample included companies from a wide variety of industries and covered a wide spectrum of sizes from large multinationals such as ExxonMobil ($219 billion in assets) to small local companies such as Good Time Restaurants ($11 million).

An initial look at the sample from the most recent reporting period provides glimpses of the magnitude of the impact that capitalizing operating leases could have on individual companies. The

average size (total assets) of each company was $5.3 billion, with a median of $1.1 billion. The average amount each company was undervalued (as measured by the present value of leases) was $471 million with a median of $117 million. Total assets were understated by an average of some 10 percent, with an even higher proportion of underreported liabilities.

Likewise, the average interest expense reported by these companies was $48 million (median $7 million). Capitalizing the operating leases and reclassifying a portion of the annual rental expense from an operating to an interest expense would increase reported interest expenses by an average of $35 million, with a median of $9 million). Thus, reported interest expenses could on average more than double.

Such changes would have a dramatic impact on the calculation of a multitude of financial ratios. For example, based on the financial statement data as reported, the mean current ratio was 2.26 (median 2.03). Based on figures adjusted to take into account the presence of operating leases, this amount falls to 2.04 (1.77), a reduction of greater than 10 percent. Even more striking is the 20 percent drop in value for Altman's Z-score, from a mean of 5.05 (median 4.40) using as-reported data to 3.68 (3.37) with the adjusted figures. A summary of results can be found below in Table 1. Note that in all cases the changes in mean and median are significant beyond the 99th percentile. Although not reported here, such significant results have remained fairly consistent over the past five years of financial data.

Another key result in examining the impact that capitalizing operating leases might have on credit analysis comes from examining the changes in the Z-scores for individual companies. A basic interpretation of the Z-score is that a company with a score above 3.00 is unlikely to suffer from financial distress, while one with a score below 1.80 is very likely to experience such difficulties. From our sample of 595 companies, 463 companies initially had Z-scores above 3.00, yet only 359 continued to have such scores after making the adjustments for the operating leases. Thus, nearly one-quarter (22.5%) of the companies considered relatively free of credit risk would not be so considered if their operating leases were taken into account. Similarly, 549 of the 595 companies initially had scores above 1.8, yet 44 of those companies would fall below the all-important 1.80 threshold when considering the impact of their operating leases.

Because of its significance as a tool used in credit analysis, we expanded the analysis to examine how operating leases might affect Altman Z-scores. We conducted a series of regressions in which we examined the relationship between changes in the Z-score with changes in the individual components of the model. We also looked at how both size, defined as the natural logarithm of total assets, and the relative amount of operating leases, measured as a ratio of current operating lease expense and present value of future obligations to total assets, might impact the Z-score. The results of the various regression models are shown in Table 2 below.

As seen in Table 2, changes in any of the five variables comprising the Altman Z-score had a significant relationship with changes in the Z-score itself. This relationship is especially strong with the Altman X_2, X_3, and X_4 variables, with evidence that the X_1 and X_5 variables (level of sales and working capital) offset each other with several models producing significant X_1 estimates and

insignificant X_5 estimates and vice versa. The effect of company size is also consistent across different models, alone or in conjunction with various combinations of the Altman variables, but in a negative sense. That is, Z-scores for larger companies are less affected by capitalizing operating leases, even if the relative amount of leasing was high.

This is especially evident in the simplest model (Model 2) that examines only the relationship of size and extent of leasing on changes in individual Z-scores. The expected positive impact of relative amount of operating leases is offset by the negative influence of company size. Further research will be needed to determine reasons for this. For example, are the larger firms in the sample less prone to be heavy users of operating leases, is it an industry-level phenomenon that has not been captured, or is it something else? More sophisticated tests will be needed to cull out more specific conclusions given the relatively high amounts of correlation among all of the variables.

Table 1: Key Financial Ratios Using As-Reported and Adjusted Financial Statement Figures

Ratio	As Reported Mean	Adjusted Mean	As Reported Median	Adjusted Median
Current Ratio	2.25	1.94	2.03	1.77
Quick Ratio	1.48	1.30	1.22	1.07
Altman X_1 (WC ÷ TA)	0.2580	0.1973	0.2644	0.1830
Altman X_2 (RetEarn ÷ TA)	0.1787	0.1129	0.2800	0.2035
Altman X_3 (EBIT ÷ TA)	0.0991	0.0710	0.0982	0.0719
Altman X_4 (MVEq ÷ TL)	4.6111	3.1446	3.2230	2.2784
Altman X_5 Sales ÷ TA)	1.3796	1.1620	1.2612	1.0790
(Altman Z-score	5.02	3.70	4.40	3.37
Interest coverage (EBIT ÷ Int)	35.58	7.66	8.09	4.04
Using Total Lease Payments		3.73		2.61
Using 1/3 of Lease Payments		6.39		4.12
EBITDA Coverage	49.36	11.38	12.41	6.67
Debt Ratio	89.56	154.70	80.32	123.20
Return on Invested Capital	8.81	6.29	8.74	6.23

Table 2: Relative Impact of Variables on Changes in Z-Scores

	Adj R^2		Intercept	PVOL pct	Size	X_1	X_2	X_3	X_4	X_5
1	0.9220	Estimate	0.22	-0.16	-0.02	0.45	2.11	6.60	0.53	0.84
		t-value	**2.22	*-1.74	*-1.84	0.99	***8.34	***5.37	***52.30	***6.72
2	0.3403	Estimate	1.63	1.80	-0.12					
		t-value	***6.48	***14.47	***-3.65					
3	0.9162	Estimate	0.26	0.18	-0.03	0.87	2.26	8.42	0.53	
		t-value	***2.60	**2.36	**-2.08	*1.84	***8.66	***6.77	***50.02	
4	0.5594	Estimate	1.52	-0.40	-0.15	3.10	2.78	24.62		-0.06
		t-value	***6.78	*-1.85	***-5.45	***2.85	***4.63	***8.77		-0.20
5	0.9183	Estimate	0.20	0.00	-0.02	0.86	2.82		0.55	0.98
		t-value	**2.01	0.03	-1.46	*1.86	***12.84		***54.76	***7.91
6	0.9129	Estimate	0.04	-0.26	0.00	0.56		12.01	0.54	0.93
		t-value	0.45	***-2.73	-0.07	1.15		***10.88	***49.96	***7.10
7	0.9220	Estimate	0.24	-0.14	-0.03		2.12	6.80	0.54	0.74
		t-value	***2.63	-1.57	**-2.16		***8.37	***5.61	***52.73	***6.92
8	0.9215	Estimate	0.05			0.51	2.07	5.84	0.54	0.74
		t-value	**2.01			1.17	***8.47	***5.02	***53.73	***7.21
9	0.9148	Estimate	0.05			1.63	2.05	10.19	0.53	
		t-value	**2.18			***3.89	***8.04	***9.81	***51.14	
10	0.5377	Estimate	0.35			4.46	2.23	23.31		-0.24
		t-value	***6.37			***4.31	***3.76	***8.59		-0.99
11	0.9183	Estimate	0.06			1.06	2.73		0.55	1.01
		t-value	**2.50			**2.47	***12.99		***56.27	***11.23
12	0.9121	Estimate	0.05			0.24		11.15	0.54	0.73
		t-value	*1.90			0.54		***10.73	***50.87	***6.70
13	0.9215	Estimate	0.05				2.05	6.19	0.54	0.78
		t-value	**2.25				***8.41	***5.49	***54.71	***8.18

***denotes significance at 99%, **significance at 95%, and *significance at 90%

Note: PVOLpct = ratio of total operating lease expense and present value of future lease obligations as a percentage of total assets; Size = natural logarithm of total assets; X_1 = net working capital as a percentage of total assets; X_2 = retained earnings as a percentage of total assets; X_3 = earnings before interest and taxes as a percentage of total assets; Altman X_4 = market value of equity as a percentage of total liabilities; and X_5 = sales as a percentage of total assets

ALTERNATIVE VALUATION MODELS

Having explored the impact that capitalizing operating leases has on the calculation and interpretation of Altman Z-scores, we next briefly examine alternative methods for valuing the operating leases. Most research in this area is based on the Imhoff, Lipe & Wright methodology, using present value calculations to determine pro forma debt and interest payment amounts associated with capitalizing operating leases. However, at least three other heuristic approaches are also found in various academic and practitioner publications.

Alternatives to the present value methodology include multiplying the current year's operating lease expense by a factor of 8 (Imhoff, Lipe & Wright, 1993), multiplying the next year's lease obligations by a factor of 6 (Ely, 1995), or multiplying *all* current and future lease obligations by two-thirds, with one-third of each year's payment representing the financing cost of the leases (Gibson, 2007) for that year. The one-third, two-third approach is noteworthy given its simplicity and its legitimacy. Securities filings typically include the one-third figure as a representation of the interest factor of the company's leasing expenses when calculating its "earnings to fixed charges" ratio as required by SEC Regulation S-K, Paragraph 503d.

Given the broader focus of examining alternative methods of valuing operating leases, the four methods (present value and three heuristic models) were evaluated using a broader sample. In this case all firms found in the Compustat database (excluding financial, non-US, and zero or negative equity firms) were included in the sample.

The 4,390 companies in the sample were then classified based on each company's use of operating leases, identified as either "non-leasers" (524), "minimal" leasers (2,632), "moderate" leasers (1,021) and "heavy" leasers (213). The designation was based on the total value of lease obligations (in present value terms) as a percentage of total assets with 0.01% to 5% deemed to be "minimal" leasers, 5.01% to 50% "moderate" leasers, and above 50%, "heavy" leasers.

Table 3: Value of Operating Leases by Different Valuation Methods

Minimal Leasers (n = 2632)	Mean	Std Dev	Median
PVOLpct	0.0258	0.0213	0.0213
PVOL13pct	0.0214	0.0194	0.0170
PVOLx8pct	0.0865	0.0765	0.0687
PVOLx6pct	0.0535	0.0473	0.0435
Moderate Leasers (n = 1021)			
PVOLpct	0.1581	0.0866	0.1314
PVOL13pct	0.1373	0.0846	0.1098
PVOLx8pct	0.3518	0.2740	0.2879
PVOLx6pct	0.2480	0.1597	0.2051

Table 3: Value of Operating Leases by Different Valuation Methods			
Heavy Leasers (n = 213)			
PVOLpct	0.8052	0.5343	0.6615
PVOL13pct	0.7342	0.5371	0.5998
PVOLx8pct	1.2258	0.8947	1.0089
PVOLx6pct	0.8319	0.4679	0.7313

Note: PVOL pct is the present value of leases as a percentage of total assets using the present value approach (and a 6% discount rate)
PVOL13pct is the value based on the one-third, two-third approach
PVOLx8pct is the value using the 8 times current lease expense approach, and
PVOLx6pct is the value based on the 6 times next year lease expense approach.

Table 3 shows the differences in means and medians of leases as a percentage of total assets using each of the four methods. It is clear that no matter what level of leasing activity a company employs, the one-third, two-thirds approach consistently understates the value of leases relative to the present value methodology, while the two multiplier approaches consistently overstate the value of leases, and by a considerable margin

Each valuation method was then evaluated in terms of their correlations. As seen in Tables 4 and 5, whether evaluated using a parametric (Pearson) or nonparametric (Kendall Tau-b) approach, the correlation of the simple one-third, two-thirds method clearly dominates the other two heuristic methods in terms of how well it tracks the results of the more *sophisticated* present value approach. Note that using a higher (e.g., 10% discount) rate does not significant affect the results, although the levels of correlation are marginally lower across the board.

Table 4: Pearson Correlations of Lease Valuation Methods By Level of Leasing				
Minimal Leasers	PVOLpct	PVOL13pct	PVOLx8pct	PVOLx6pct
PVOLpct	1.0000			
PVOL13pct	0.9314	1.0000		
PVOLx8pct	0.4452	0.3674	1.0000	
PVOLx6pct	0.7656	0.6460	0.6133	1.0000
Moderate Leasers	PVOLpct	PVOL13pct	PVOLx8pct	PVOLx6pct
PVOLpct	1.0000			
PVOL13pct	0.9514	1.0000		
PVOLx8pct	0.1380	*0.0691	1.0000	
PVOLx6pct	0.4972	0.3683	0.4199	1.0000
Heavy Leasers	PVOLpct	PVOL13pct	PVOLx8pct	PVOLx6pct

Table 4: Pearson Correlations of Lease Valuation Methods By Level of Leasing				
Minimal Leasers	PVOLpct	PVOL13pct	PVOLx8pct	PVOLx6pct
PVOLpct	1.0000			
PVOL13pct	0.9775	1.0000		
PVOLx8pct	0.4952	0.4134	1.0000	
PVOLx6pct	0.7739	0.6672	0.6927	1.0000
All correlations significant at the 99% level, except for *, significant at the 95% level.				

One conclusion that may be reached in evaluating these results is that, assuming absolute precision in the valuation of operating leases is not paramount, the one-third, two-thirds approach gives a very good approximation of the more complex present value method. And this is true over a wide range of discount rates that may be appropriate for the present value calculation. Thus, given its relative ease of calculation and seemingly high level of accuracy, the one-third, two-thirds approach may be an appropriate tool to use when incorporating operating lease obligations into one's analysis of a company's overall financial, and especially credit, situation.

Table 5: Kendall Tau-b Correlations of Lease Valuation Methods By Level of Leasing				
Minimal Leasers	PVOLpct	PVOL13pct	PVOLx8pct	PVOLx6pct
PVOLpct	1.0000			
PVOL13pct	0.9420	1.0000		
PVOLx8pct	0.4608	0.4339	1.0000	
PVOLx6pct	0.7164	0.6759	0.5979	1.0000
Moderate Leasers	PVOLpct	PVOL13pct	PVOLx8pct	PVOLx6pct
PVOLpct	1.0000			
PVOL13pct	0.8781	1.0000		
PVOLx8pct	0.1763	0.1182	1.0000	
PVOLx6pct	0.3739	0.2953	0.5328	1.0000
Heavy Leasers	PVOLpct	PVOL13pct	PVOLx8pct	PVOLx6pct
PVOLpct	1.0000			
PVOL13pct	0.8730	1.0000		
PVOLx8pct	0.2505	0.1531	1.0000	
PVOLx6pct	0.3674	0.2587	0.7091	1.0000
All correlations significant at the 99% level.				

CONCLUSIONS

In light of the current activities of the FASB and the IASB regarding the proper accounting for "operating" leases, we have initiated a review of some of the potential impacts that capitalizing those leases would have on various financial ratios, particularly those used to assess the credit standing of companies. Given the crucial nature that credit analysis plays in the credit-providing functions of the economy, changes caused by the retooling of this accounting standard could have a dramatic impact on the credit process.

The issue of trying to assess a company's financial situation when it engages in a significant amount of operating leases is not a new one. It has been examined in academia and the professional literature since FASB 13 was first issued over thirty years ago, and even earlier. However, many of these approaches have been inconsistent or insufficient at best. We believe we have provided a new beginning to assessments of the effects operating leases have on various company's operations, and the financial reporting of those operations. This is likely a fruitful area of research, given the practical nature of the results, as well as the current economic situation in which the credit-providing industry has come under such increased scrutiny.

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USING FINANCIAL STATEMENT ANALYSIS TO EXPLAIN THE VARIATION IN FIRMS' EARNINGS-PRICE RATIOS

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ABSTRACT

The earnings-price (E/P) ratio represents a market-based ranking of a firm's value relative to its earnings. Entities of like size operating in the same industry and enjoying similar current earnings, however, may experience significantly different E/P ratios. This occurs because share price reflects the market's perceptions of the future earnings (and cash flow) potential of a company rather than its present earnings. If the market is optimistic about a firm's future earnings prospects, current share price increases resulting in a lower E/P ratio. A question largely ignored in the literature is what factors are useful in explaining the variation among firms' E/P ratios (i.e., other than current earnings, what influences investors' expectations concerning future earnings)?

Ou and Penman (1989) demonstrate that several traditional financial statement variables can be used to predict whether a company will experience an increase or decrease in one-year-ahead earnings. In addition, Anderson and Brooks (2006) note that four primary factors influence E/P ratios (i.e., year, industry, size, and idiosyncratic effects). Idiosyncratic effects represent those factors unique to individual entities. Controlling for year, industry, and size, the current study develops ordinary least squares regression models to explain the variation in firms' E/P ratios using financial statement variables to capture the idiosyncratic effects. An R^2 of .62 in the final model reveals that traditional financial statement analysis explains a large portion of the variation in E/P ratios among firms.

INTRODUCTION

The price-earnings (P/E) ratio and its inverse, the E/P ratio, represent commonly used measures of the value of a company's stock relative to its earnings potential. Typically computed as the latest closing price divided by the most recent annual basic earnings per share (EPS), the P/E ratio allows for the comparison of firms within a given industry. Two companies with relatively similar current earnings figures might possess markedly different P/E ratios. For example, ExxonMobil and Marathon Oil are both large oil and gas companies that enjoyed strong earnings

in 2006 (i.e., EPS of $6.68 and $6.93, respectively). Yet, their P/E ratios calculated at the end of 2006 (i.e., 11.60 and 6.40, respectively) reflected different market perceptions of the two firms. Pratt (2001) notes that such discrepancies exist among firms in their P/E ratios because of investors' expectations concerning future earnings. "The greater the optimism that investors are attaching to [a firm's] future income stream," the higher is its P/E ratio (Pratt, 2001, 44).

Ball and Brown (1968) find that accounting earnings are valued positively by investors. Higher earnings imply higher stock values, while lower earnings suggest lower stock prices. However, Keim (1990) notes that share price variability among firms arises because of different expectations concerning cash flows (i.e., the ability to pay dividends). In reality, share prices are determined by both earnings and cash flows (i.e., dividend payments) because, as Ou and Penman (1989) indicate, future dividends are paid out of earnings.

In the example above, even though ExxonMobil and Marathon Oil experienced similar earnings in 2006, the market (i.e., investors) obviously felt that ExxonMobil's future earnings potential appeared more favorable than Marathon's. ExxonMobil's stock traded at 11.6 times current earnings, while Marthon's stock sold at only 6.4 times current earnings. With two companies of similar size operating in the same industry at the same time period and enjoying almost identical current earnings, why does the market view one's future earnings and cash flow potential with more optimism than the other? The current study examines numerous financial statement variables to ascertain whether these measures provide useful information in explaining the variation in firms' stock values relative to their current earnings. The results suggest that profit margin, percentage change in return on investment, and percentage change in log of total assets jointly explain a significant portion of this variation.

LITERATURE REVIEW

Nicholson (1960), McWilliams (1966), Latane et al. (1969), Dowen and Bauman (1986), Keim (1990), and Fama and French (1992) provide evidence that stock returns are linked to P/E ratios. Generally, in the long run, portfolios comprised of firms with low P/E ratios outperform portfolios containing companies with high P/E ratios. It is speculated that this phenomenon occurs because with high P/E ratio stocks investors have bid the prices up too sharply in relation to the growth potential in earnings. When the expected growth in earnings does not materialize, share price suffers.

Penman (1996), however, notes that the P/E ratio (or alternatively the E/P ratio) acts not as a predictor of share price or returns but of future earnings levels. Allen et al. (1998) conclude similarly as their results indicate that firms with high E/P stocks have relatively low earnings growth while companies with low E/P shares experience high earnings growth. Furthermore, Fuller et al. (1992) conclude that accounting earnings changes are not randomly distributed; their findings indicate that stocks sell at widely diverging P/E ratios because these ratios reflect consensus earnings growth forecasts. They show that low P/E ratio stocks generate low future earnings growth while

high P/E ratio shares result in high earnings growth. Likewise, Ou and Penman (1989) note that P/E ratios are good predictors of future earnings while changes in share price are poor predictors of future earnings.

Thus, significant research exists supporting the notion that P/E ratios represent good indicators of future earnings levels. Another line of research (e.g., Beaver, 1989; Mande, 1994) provides strong evidence that earnings aids investors in evaluating a firm's dividend paying ability. As Larcker (1989) notes, share price is determined in the market through capitalization (i.e., discounting) of the future cash flows or dividends expected to accrue to stockholders. Since earnings provide an information signal about future cash flows, stock price is affected by expectations concerning earnings. Because P/E ratios act as predictors of future earnings, these ratios are also linked to share price or returns.

A research question largely unaddressed in the literature is what factors are considered by the market in evaluating the future earnings potential of a firm? Obviously, current earnings would be a predictor of future earnings, but what factors in addition to this impact the market's perceptions of future earnings? Without doubt, additional variables besides current earnings provide useful insight to the market about firms' future earnings potential; otherwise, all firms with similar current earnings would trade at the same share price. Differences in P/E ratios occur among firms, though, because the market is able to differentiate the future earnings potential of the entities, and this information is impounded into the current stock price. The primary purpose of this study is to identify factors that aid the market in distinguishing the earnings potential of firms (i.e., more specifically, what factors, other than current earnings, are related to firms' P/E ratios).

METHODOLOGY

Ou and Penman (1989) provide some insight for identifying factors that might be useful in explaining the variation among firms' P/E ratios. They develop LOGIT models to predict earnings increases or decreases one year ahead (i.e., a binary variable) using financial statement variables. Their independent variables include numerous measures within the traditional performance categories (i.e., liquidity, turnover, profitability, and leverage), and their results indicate that several financial ratios provide useful information for predicting the direction of the change in earnings for the next period. Ou and Penman (1989), thus, conclude that financial statement analysis is useful in forecasting future earnings changes and stock returns. Logically, then, it seems reasonable that some of these same performance measures could be beneficial in explaining the variation among firms' P/E ratios.

Anderson and Brooks (2006) note that the P/E ratio results from a network of influences, both internal and external to the firm. They identify four major influences on an entity's P/E ratio. First is the *year*. The average market P/E ratio varies by year as investor confidence changes from year to year. Second is the *sector* in which the company operates. Different sectors or industries experience varying growth rates in earnings. Companies in industries with strong long-term

earnings growth rates should experience higher P/E ratios than firms in sectors with mature or declining earnings growth rates. Third is the *size* of the company. Numerous studies (e.g., Dowen & Bauman, 1986; Keim, 1990) demonstrate that P/E ratios are linked to entity size with larger firms typically enjoying higher P/E ratios than smaller companies. Fourth is what Anderson and Brooks (2006) call the *idiosyncratic effects*. Different firms examined in the same year, operating in the same industry, and of similar size can still experience vastly different P/E ratios. The discrepancy in the 2006 P/E ratios for ExxonMobil and Marathon Oil discussed earlier exemplifies this phenomenon. Idiosyncratic effects represent factors unique to individual firms, and they cause these differences in P/E ratios among entities. For example, one company's stock might sell at a high P/E ratio because the firm recently settled a major lawsuit favorably, which creates an opportunity for expansion into new product lines.

The methodology used in the current study relies heavily on the findings in the Anderson and Brooks (2006) and Ou and Penman (1989) projects. In particular, this study aims to develop a model to explain the variation in firms' P/E ratios by examining the idiosyncratic effects (i.e., Anderson & Brooks, 2006) that can be represented by performance measures obtained from traditional financial statement analysis (i.e., Ou & Penman, 1989).

To isolate the idiosyncratic effects, the sample selection controls for year and sector by collecting data for a single year (i.e., 2006) for companies operating in one sector (i.e., the oil and gas industry). Firms in the oil and gas industry are examined because this industry embodies a mature, stable sector with strong earnings potential. To control for the size effect, the log of total assets is included in the model as an independent variable. The log of total assets is used to capture entity size rather than total assets because the latter measure is often non-normally distributed. Using the log of total assets normalizes the data while maintaining the basic nature of the relationships among the firms (e.g., see Bensoussan et al., 1995; Ganugi et al., 2005).

Ordinary least squares (OLS) regression models are developed to identify performance measures that may embody some of the idiosyncratic effects influencing P/E ratios. The dependent variable examined, however, is not the P/E ratio but rather the E/P ratio. The E/P ratio contains the same information as the P/E ratio and should be related to the same independent variables, except with opposite signs of course. In analyzing the P/E ratio, its inverse (i.e., the E/P ratio) is often studied instead because of its favorable mathematical properties (e.g., see Latane et al., 1969; Keim, 1990; Anderson & Brooks, 2006). In particular, as Allen et al. (1998) note, the E/P ratio allows for the ranking of stocks for all companies, even those with negative earnings. That is, ranking by E/P results in negative earnings firms having the lowest E/P ratios while ranking by P/E does not result in negative earnings firms having the highest P/E ratios (i.e., division by a negative number is undefined). Thus, developing models using P/E ratios requires omission of negative earnings firms, which results in both fewer degrees of freedom and a sample that is unrepresentative of the general population of firms. Examining the E/P ratio avoids these problems. In addition, P/E ratios become abnormally large if earnings approach zero, thus creating outliers in the data. Again, the E/P ratio does create such a problem.

The E/P ratio for each company in the sample is computed as the 2006 basic EPS from continuing operations divided by the share price three months subsequent to the firm's 2006 year end. Financial information does not become publicly available to the market until some time after the year end. Thus, using a three-month forward lag in the share price allows information contained in the financial statements to be fully impounded into the price and is common practice in studies examining E/P ratios (e.g., Banz & Breen, 1986; Keim, 1990; Allen et al., 1998).

To develop the OLS models, 2006 and 2005 year-end financial statement data are collected on 73 randomly-selected, publicly-traded oil and gas firms from the Lexis-Nexis Business database. The sample includes companies of all sizes. The independent variables represent a large set of performance measures typically used in financial statement analysis (e.g., see Ou & Penman, 1989) and comprise both static measures of performance for 2006 (e.g., 2006 return on investment) as well as fluid measures of performance (e.g., % change in return on investment from 2005 to 2006). A total of 25 independent variables are initially examined; this original set of variables appears in Table 1.

To evaluate the contribution of each independent variable in explaining the variation in firms' E/P ratios, a simple regression model is developed for each independent variable regressed on the E/P ratio. A final model is next developed by combining the independent variables that display a statistically significant relationship with the dependent variable. All independent variables in the final model are then checked for the presence of multicollinearity.

RESULTS

Table 1 provides summary results for each of the 25 simple regression models. The independent variable in each model is regressed on the E/P ratio. The variables (i.e., models) are grouped in Table 1 by performance category (i.e., liquidity, leverage, profitability, turnover, and other). Since EPS is an integral component of the dependent variable, it is not considered as a potential independent variable. However, the percentage change in EPS from 2005 to 2006 is included because it represents a legitimate piece of information investors might use in evaluating the future earnings potential of a firm.

The current study is exploratory in nature in that it seeks to ascertain which financial statement measures, if any, provide useful information in explaining the variation among firms' E/P ratios. As such, the list of potential independent variables is expansive and no initial judgment is made concerning which financial measures would be expected to provide the strongest links with the E/P ratio. However, Table 1 shows that the majority of these financial statement ratios possess only weak-to-mild relationships with the dependent variable. Using an alpha level of .01 for determining statistical significance, only three independent variables have t-statistics with p-values indicating they are related to the E/P ratio at statistically significant levels. These are the 2006 profit margin, % change in return on investment (ROI) from 2005 to 2006, and % change in log of total assets (LTA) from 2005 to 2006.

Table 1: Simple Regression Models for Variables Regressed on E/P Ratio				
Independent variable	Coefficient sign	t-stat	t-stat P-level	Model r^2
Liquidity ratios:				
2006 quick ratio	+	1.05	.297	.016
% change in quick ratio 2005 to 2006	+	0.58	.564	.005
2006 current ratio	+	1.02	.311	.015
% change in current ratio 2005 to 2006	+	0.73	.469	.008
Leverage ratios:				
2006 debt ratio	+	0.60	.551	.005
% change in debt ratio 2005 to 2006	+	0.35	.724	.002
Profitability ratios:				
% change in EPS 2005 to 2006	-	-1.11	.271	.017
2006 profit margin	+	4.54	.000	.225
% change in profit margin 2005 to 2006	-	-0.93	.358	.012
2006 return on investment	-	-1.17	.244	.019
% change in return on investment 2005 to 2006	-	-7.47	.000	.440
2006 operating cash flow (CF) per share	+	0.27	.791	.001
% change operating CF per share 2005 to 2006	+	0.63	.529	.006
2006 sales per share	+	0.40	.687	.002
% change in sales 2005 to 2006	-	-0.23	.816	.001
2006 dividend per share	+	0.73	.467	.008
% change in dividend per share 2005 to 2006	-	-0.79	.434	.022
Turnover ratios:				
2006 receivables turnover	+	0.83	.410	.010
% change in receivables turnover 2005 to 2006	-	-1.00	.319	.015
2006 asset turnover	+	0.69	.493	.007
% change in asset turnover 2005 to 2006	-	-1.42	.161	.029
Other ratios:				
2006 assets per share	+	0.27	.788	.001
% change in assets per share 2005 to 2006	+	0.63	.533	.006
2006 log of total assets	+	1.61	.113	.035
% change in log of total assets 2005 to 2006	+	4.37	.000	.212

The 2006 profit margin is computed as the percentage of income from continuing operations to sales; it represents a commonly used performance measure for evaluating a firm's ability to control costs or expenses. For example, a profit margin of 7.4% indicates that every dollar of sales revenue generates 7.4 cents in bottom line profit or alternatively that for every dollar of sales revenue 92.6 cents of it is consumed in cost. Profit margin embodies a static measure of a company's ability to generate income in the current period as opposed to a fluid measure concerning the change in that ability. As such, the direct relationship (i.e., positive coefficient) between the 2006 profit margin and the 2006 E/P ratio appears logical. Intuitively, the higher the 2006 profit margin for a firm, the better that entity is at controlling costs. Relative to other firms, a company that is adept at controlling costs in the current period would be expected to generate higher current earnings. Thus, with current year's earnings as the numerator in the E/P ratio, the positive relationship with the profit margin variable is anticipated.

The second statistically significant independent variable is the % change in ROI from 2005 to 2006. At first glance, it might appear that this variable provides a measure of current profitability similar to the profit margin since ROI gives an indication of a firm's ability to use its assets in generating earnings. However, the variable that is significant is the % change in ROI, which has little relationship with current profitability but instead indicates the direction in which the earnings ability of the firm is headed. Of the three statistically significant independent variables, the relationship between this variable and the E/P ratio is by far the strongest. For example, the simple r^2 for % change in ROI of .440 shows that this variable alone explains 44% of the variation in the firms' E/P ratios. The r^2s of .225 and .212 for profit margin and % change in LTA, respectively, are approximately half that produced by the % change in ROI variable.

In addition, the negative coefficient for the % change in ROI variable is as expected. The E/P ratio, in essence, embodies a ranking of a firm by the market as investors evaluate the entity's future earnings potential. A company's stock trades at a higher price (and, therefore, a lower E/P ratio) if the market is optimistic about the firm's growth potential in earnings. Thus, if a company's ROI increased from 2005 to 2006, this represents a strong sign to the market that its earnings are on the upswing, and the larger the positive change in ROI from 2005 to 2006 the more optimistic would be the market's expectations for future earnings growth. The end result would be a larger share price relative to other firms and, consequently, a lower E/P ratio.

The third, and final, statistically significant independent variable is % change in LTA from 2005 to 2006. It is important to note that this variable is not a static measure but rather hints at the future direction of the firm in terms of how it pays out its earnings. Generally, a company uses its discretionary earnings either to pay dividends to its owners or to reinvest in the firm (i.e., asset growth). Of course, a third alternative is to liquidate maturing debt, but this use of earnings is mandatory, not discretionary.

Increasing total assets during the year signals a reinvestment mindset by management, and the larger the percentage increase in assets the more prominent is this mindset. A growth strategy in assets in the current year may be perceived by the market as an indication that future earnings will

be used to continue growing the firm. As such, less earnings would be available to pay future dividends, thus driving the current price of the stock down relative to earnings. The result would be a higher E/P ratio. Therefore, the positive relationship (i.e., coefficient) between % change in LTA from 2005 to 2006 and the 2006 E/P ratio appears logical.

A final regression model is prepared that simultaneously regresses the three individually significant independent variables on the E/P ratio. A fourth independent variable is included in this multiple regression model to control for entity size. As Anderson and Brooks (2006) note, four broad factors affect the E/P ratio (i.e., year, industry, size, and idiosyncratic effects). Using cross-sectional data for one period (i.e., 2006) controls for year, and examining only oil and gas firms controls for industry. Including an independent variable measuring the 2006 log of total assets (LTA) captures the size effect. Controlling for these three factors allows the analysis to concentrate on the variables related to individual company performance (i.e., the idiosyncratic factors). Table 1 shows that a simple OLS model regressing the 2006 LTA on the E/P ratio results in a statistically insignificant relationship (i.e., a p-level of .113). However, for the reason noted above, this independent variable is included in the final model, which appears in Table 2.

The three independent variables that are significantly related to the E/P ratio when examined individually remain statistically significant when combined in the multiple regression model. That is, the p-levels are .0005, .0000, .0003, respectively, for 2006 profit margin, % change in ROI from 2005 to 2006, and % change in LTA from 2005 to 2006. This represents an important result because it demonstrates that each of these three independent variables contributes unique information in explaining the variation in firms' E/P ratios. In addition, the signs of the coefficients for these variables in the final model are as expected (i.e., same as discussed earlier for the simple regression models). Not surprisingly, since it is insignificant as an individual variable, the 2006 LTA remains insignificant when combined with the other variables in the multiple regression model. A final test conducted of the model's validity is a correlation matrix to determine if the model suffers from problems caused by extreme collinearity among the independent variables. Table 3 contains the correlation matrix.

Table 2: Summary Statistics for Final Regression Model

Independent variable	Coefficient	t-stat	t-stat P-level	Sequential R^2
Intercept	-.143560	-1.07	.2903	N/A
2006 profit margin	.000142	3.64	.0005	.225
% change ROI 2005 to 2006	-.000227	-6.14	.0000	.524
% change LTA 2005 to 2006	.036480	3.82	.0003	.610
2006 LTA	.010510	1.08	.2840	.616
Model F ratio = 27.29 (p-level = .0000)				

Table 3: Correlation Matrix for Independent Variables in Final Model				
Variable	2006 profit margin	% change in ROI	% change in LTA	2006 LTA
2006 profit margin	1	N/A	N/A	N/A
% change in ROI	-.2982	1	N/A	N/A
% change in LTA	.1152	-.2491	1	N/A
2006 LTA	.0578	-.1256	.0897	1

As Horngren et al. (1997) note, some collinearity among independent variables is expected, and it does not become problematic unless the correlation coefficient approaches an absolute value of .7. Table 3 shows that the final model does not suffer from problems caused by undue collinearity among the independent variables as the strongest correlation coefficient between any pair of explanatory variables is -.2982 for % change in ROI and 2006 profit margin. Initially, one might suspect that the 2006 LTA and the % change in the LTA would be highly correlated since both variables relate to the log of total assets; however, a correlation coefficient of .0897 reveals that only a slight relationship exists between these two variables. This occurs because the two variables actually measure markedly different phenomena. The 2006 LTA measures the size of a firm, while the % change in LTA captures the growth of a firm. A large company could experience tremendous growth or alternatively little or negative growth during the year. The same is true for a small firm. With the absence of multicollinearity problems, an F ratio of 27.29 (p-level = .0000), and a strong R^2 of .616, the final model presented in Table 2 indicates that traditional financial statement measures can be used to explain a large portion of the variation in firms' E/P ratios.

SUMMARY AND CONCLUSION

The P/E and alternatively the E/P ratios provide an indication of the market's valuation of a firm's stock relative to the entity's earnings potential. This study attempts to identify factors, other than current earnings, that are useful in explaining the variation in firms' E/P ratios. Ou and Penman (1989) demonstrate that traditional financial statement analysis can be beneficial in predicting the direction (i.e., increase or decrease) in one-year-ahead earnings. In addition, Anderson and Brooks (2006) identify four factors that influence a company's E/P ratio (i.e., year, industry, size, and idiosyncratic effects). Idiosyncratic effects embody those that are unique to individual firms. Drawing on the findings of both Ou and Penman (1989) and Anderson and Brooks (2006), the present study identifies a parsimonious set of financial measures (i.e., idiosyncratic effects) useful in explaining a sizable portion (almost 62%) of the variation in firms' E/P ratios.

The models developed in this study control for year, industry, and size; thus, the specific variables identified in the current project might not apply if a different year or industry had been

sampled or if an alternative method had been used to control for entity size. For example, if the financial service industry was sampled rather than the oil and gas industry, different independent variables other than the three found in this study might have been significant. The contribution of this study lies not in the identification of particular explanatory variables, *per se*, but rather in the overall finding that traditional financial statement analysis provides information content for explaining the variation in the market's perception of firm value. The findings remove some of the mystery surrounding how the market values a firm's stock relative to its earnings. More specifically, the study sheds some light on what factors the market apparently perceives as important in evaluating an entity's future earnings and cash flow potential.

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THE NEGATIVE EFFECT OF THE MARRIAGE PENALTY TAX ON AMERICAN SOCIETY

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DEDICATION

Researcher, scholar, and marriage penalty tax expert, the late Leslie A. Whittington, Professor of Public Policy at Georgetown University in Washington D.C., was killed on 9-11, 2001 when American Airlines Flight 77 crashed into the Pentagon with 59 people aboard. Professor Whittington, her husband, Charles Falkenberg, and their two daughters, 8-year old Zoe and 3-year old Dana were traveling to Los Angeles and then on to Australia where Whittington had been named a visiting fellow at Australian National University in Canberra.

ABSTRACT

This study is an extension of prior research that quantifies the magnitude of the marriage penalty tax (MPT) and measures the distributional effects on the U.S. population in general. We use the Internal Revenue Service's Statistics of Income (SOI) data and the Census Bureau's year Current Population Survey (CPS) database. Estimates of the MPT are computed based on the effects of the most recent tax act to all taxpayers according to class of income. The study examines distribution of the MPT and projects effects of current tax law affecting MPT, the Jobs and Growth Tax Relief Reconciliation Act of 2003 (JGTRRA). Results of this study indicate that after passage of JGTRRA the marriage penalty tax was reduced, but it continues to negatively impact many married persons in American society. To make matters worse, reductions in MPT will 'sunset' or expire after 2010, unless Congress votes to extend provisions of JGTRRA. The marriage penalty tax has important negative implications for the social welfare of the nation. Numerous studies on family structure, controlling for variables such as race, education and income level, indicate that children raised in married two-parent families have better outcomes on average than children raised in other settings. The MPT is anti-marriage and anti- family; as a result, the MPT is detrimental to children and society. Families are the foundation for civilization; when families fail, civilization breaks down. Given its negative social consequences, the MPT should be eliminated.

INTRODUCTION

The marriage penalty tax (MPT) has been a topic of considerable discussion and debate by politicians, academicians, researchers, legislators, and, of course, individual taxpayers ever since Congress enacted the 'married filing jointly' status in 1913. MPT occurs when the total tax liability incurred by a married couple on their combined income exceeds the amount owed had they filed as separate/single individuals. To engender the public trust, tax policy must be both fair and equitable. Policy makers must not only consider equity but also political and social implications as well in the formulation and subsequent modification of tax law.

The objective of this study is to investigate empirically the impact of changes in tax law to determine whether, in fact, legislation truly accomplishes the intentions of Congress and the President. An important caveat in this regard is that Presidential and Congressional intentions, like tax laws, are subject to continual change as a result of changes in the political party that controls the White House and Congress. In 2006, control of Congress switched from Republican to Democratic control (Cook 2006).

To fully evaluate the impact of the new tax law, its distributional effects on each income class of taxpayers must be accurately identified. The results of this study will assist policy makers and tax researchers in assessing the net impact of changes in tax policy on income redistribution regarding MPT in the U.S. We extend previous MPT literature by empirically assessing the impact of changes in tax law on MPT in an attempt to determine whether the higher tax burden on married couples is reduced or eliminated. Further, the effects on and consequences of MPT on society as a whole are considered.

On June 7, 2001, President Bush signed into law The Economic Growth and Tax Relief Reconciliation Act of 2001 (EGTRRA 2001) asserting that, among other changes, this Act was intended to reduce MPT. Relief was administered in two forms – the phase-in of an increase in the standard deduction for married couples and expansion of the income subject to the 15 percent rate to an amount equal to twice that of single taxpayers. Subsequently, the phase-in schedule for the increase in the standard deduction was delayed to 2005 (at 174% of the single standard deduction) and gradually increasing to 190% in 2008. The expanded 15% rate bracket for married couples filing joint returns increased from 180% of the single bracket in 2005 and to 200% in 2008.

On May 28, 2003, in an effort to spur a lagging economy, President Bush signed the Jobs and Growth Tax Relief Reconciliation Act of 2003 (JGTRRA 2003) into law. JGTRRA 2003 accelerated many of the provisions of EGTRRA 2001, increased the childcare tax credit, temporarily doubled the standard deduction for married couples, and attempted to address the inequity of MPT. In an address to the Nation, President George W. Bush stated: "My tax cut plan is not just about productivity, it is about people. Economics is more than narrow interests or organized envy. A tax plan must apply market principles to the public interest. And my plan sets out to make life better for average men, women, and children. The current tax code is full of inequities. Many single moms face higher marginal tax rates than the wealthy. Couples frequently face a higher tax burden

after they marry. High marginal tax rates act as a tollgate, limiting the access of low and moderate-income earners to the middle class. *The current tax code frequently taxes couples more after they get married. This marriage tax contradicts our values and any reasonable sense of fairness*" [emphasis added] (White House 2003).

According to Republican Representative Nancy Johnson of Connecticut, the MPT is especially onerous to women. Representative Johnson said: "I'll tell you our tax code and the penalty that it levies on married couples is not only cruel and unusual but it strikes at the dignity of women" (PBS 2000). The MPT has historically been a divisive partisan issue in which Republicans favor total elimination of the MPT, while Democrats are mostly opposed (Stevenson 2000, CNN 2000, PBS 2000). Occasionally, some Democrats align with Republicans to support tax reductions, including elimination of the MPT (Allen 2008). Not surprisingly, demographic data based on the 2004 election shows that shows that married people, especially parents with children at home, strongly support Republican positions. Exit polling data indicated that President Bush led by 57%-42% among all married Americans, and 59%-40% among married people with children (Pew Research Center 2005).

With the enactment of the Jobs and Growth Tax Relief Reconciliation Act of 2003, President Bush indicated that the burden of MPT in the American tax system would be removed or at least largely eliminated. As Kinney (2003) appropriately stated, "In policy related research, if the government says something is true, we, as accounting researchers, can test to see if it actually is true."

Research on tax policy has examined the impact of such issues as changes in capital gains taxes or depreciation rules and their impact on businesses and individuals. It is widely recognized that public policy implemented via tax law affects decision-making by business managers and individuals and thereby affects the economy. Perhaps not so obvious is the effect on issues such as marriage. Social researchers have found that marriage decisions have significant consequences on individuals, their children (if they are or become parents), and our society at large. The impact of marriage on children is highly researched (e.g. Demuth and Brown 2004, Deleire and Kalil 2002, Hoffman and Johnson 1998). Research also examines the impact of marriage on marriage partners, whether parents or not (Colson and Fickett 2005, Massachusetts 2004, Morse 2001, Popenoe and Whitehead 2000). A stream of research also examined the impact of tax law on marriage (e.g. Whittington and Alm 2001; Cook et al. 2001; Alm and Whittington 1995, 1996, 1999; Moffit et al. 1998; Gelardi 1996; Feenberg and Rosen 1995).

This study utilizes aggregate data from the Statistics of Income (SOI) department of the Internal Revenue Service (IRS 2004). This data consists of actual income tax returns filed by married filing joint taxpayers for the year 2000. Additionally, census data maintained by the Census Bureau's year 2000 Current Population Survey (CPS) is employed to allocate consistently the various items of income, expenses, dependency deductions, credits, and other items (Census Bureau 2000), allowing us to calculate and compare MPT before and after changes in tax law. Research

questions addressed in this study are designed to examine whether tax legislation does, in fact, remove or largely eliminate MPT.

This study is of significance to legislators, policy makers, researchers and, of course, to individual taxpayers. Additional exploration and discussion of these changes is strongly encouraged in order to derive a comprehensive view of their impact on taxpayers' marital status. The availability of current income tax data, significant shifts in spousal employment trends, and recent changes in tax legislation suggest that knowledge of MPT must be updated.

HISTORY OF MARRIAGE PENALTY TAX

MPTs (or marriage bonus tax -- MBT, i.e., lower tax) arise when the total tax liability incurred by a married couple on their combined income is greater (less) than that owed had they filed as single/separate individuals. The question of some policy makers, especially the U.S. Congress, is that if MPT were eliminated (thus decreasing federal tax revenues), should not the marriage bonus tax also be eliminated? Such a perspective may be misguided, if indeed the concern is truly about overall federal revenues and outlays. The biggest so-called marriage "bonus" (reduced) tax goes to a married couple in which only one spouse is working, which may mean that one spouse gave up a job to be a full-time caregiver for children. If the couple were to nullify their marriage, the MBT (decrease in federal revenues) would, in most cases, likely be more than offset by government transfer programs (increase in federal outlays such as EITC, welfare, food stamps, etc.) that would be due to the non-working person (former spouse). Thus, eliminating the MPT should not automatically call for eliminating the so-called "bonus," at least not if the purpose is to improve federal cash flows. In any case, for the following analyses, the net MPT (or bonus) will be evaluated. Precisely determining net MPT (or MBT) is a complex problem. Researchers examining MPT/MBT questions have found that several assumptions must be made regarding the division of income to estimate the tax liability a married couple would have incurred had they been permitted to file as two single/separate individual taxpayers. Numerous factors contribute to the disparity in tax liabilities between individuals filing as single versus married filing jointly. Tax rates, tax brackets, allowable standard deductions, childcare credits, and other factors all cause a shift in tax liabilities. The intricacies of the earned income tax credit and the various phase-in/out thresholds further complicate the analysis. Essentially, while holding income and investment decisions constant, research has indicates that marriage itself accounts for a considerable disparity in tax liability. While married couples may encounter differences in overall cash-flow outlays or spending compared to singles, this study will limit its investigation to the disparity (i.e., MPT), which arises solely because of marital status. In addition, the social costs associated with the MPT will be considered.

McIntyre and McIntyre (1999) confirm that MPTs have been in place since the adoption of the federal income tax in 1913. At that time, a personal exemption of $3,000 was allowed to a single person and $4,000 (or $2,000 each) to a married couple. Thus, a single individual received a personal tax exemption which was $1,000 or fifty-percent greater than that of a married individual.

In 1948, most significant MPTs were temporarily eliminated with the adoption of full income splitting for married couples. The Revenue Act of 1969 reintroduced MPTs by abandoning full income splitting in favor of marital joint filing with partial income splitting. The Tax Reform Act of 1986 significantly reduced most MPTs, primarily by a substantial reduction in tax rates. The Revenue Reconciliation Acts of 1990 and 1993 increased MPTs for high-income married couples while lowering MPTs for certain low-income married couples with children. However, the 1990 and 1993 acts increased MPTs for many low-income couples with children through the imposition of limitations of income on earned income tax credits (EITC).

TAX RATE SCHEDULES AND STANDARD DEDUCTION

The U.S. employs a voluntary income tax system based on progressive rates; tax rates increase as taxable income increases. U.S. taxes subject four classes of taxpayers (married filing jointly, married filing separately, single, and head of household) to progressive gradient levels, or brackets, of tax rates.

Additionally, in determining taxable income, taxpayers are allowed a deduction for specific expenses (itemized deductions) for medical costs, certain taxes, mortgage interest, charitable contributions, casualty losses, job expenses, and certain expenses incurred in connection with the production or collection of income. For taxpayers who do not have sufficient expenses, a standard deduction, a different amount to each class, is allowed to each group of taxpayer in lieu of itemized deductions. Thus, taxpayers may take a deduction for their actual itemized expenses or for the standard deduction, whichever is greater. The standard deduction allowed to the taxpayers is regarded as an efficiency technique useful in minimizing tax administration since this deduction is deemed to be de minimis in nature. Exhibit 1 shows standard deductions for tax years pre- and post-JGTRRA.

In general, MPT arises because of disparity in the bracketed amounts of the graduated tax rate schedules as well as in the standard deductions allowed for married vs. non-married taxpayers, ceteris paribus. Since tax rate brackets and standard deductions for married couples filing jointly are not exactly twice those allowed for single individuals, a difference that tends to create MPT for the couple filing as married jointly occurs. JGTRRA 2003 attempted to mitigate this disparity, at least temporarily, in the lower brackets by setting the brackets of the married joint tax rates equal to twice that of single taxpayers for the initial two tax rate levels (10% and 15%). However, disparity is once again evident when the subsequent four tax rate brackets for each class of taxpayer are compared.

For 2003 and 2004, married filing joint taxpayers were allowed a deduction equal to twice that of the single person. In 2005, the deduction decreased to 174% but increases to 200% in year 2009. These reductions in MPT will 'sunset' or expire after the year 2010. This sunset provision may be intended to permit the evaluation of the impact of the tax law prior to proposing a permanent

substantial reduction in or eventual elimination of MPT. This research may be useful in resolving this issue.

Exhibit 1

Standard Deductions for Tax Years Pre- and Post-JGTRRA

	MF-Joint	MF-Sep	Single	Head of Household
Pre-JGTRRA				
2000	7,350 (167% of Single)	3,675	4,400	6,450
Post-JGTRRA				
2003	9,500 (200% of Single)	4,750 (50% of MFJ=S)	4,750	7,000
2004	200%			
2005	174%			
2006	184%			
2007	187%			
2008	190%			
2009	200%			
2010	200%			

PRIOR EMPIRICAL RESEARCH

Historically, interpretations of MPT (MBT) vary greatly. McIntyre and McIntyre (1999) state that total elimination of MPT would reduce federal tax revenues by approximately $42 billion per year (stated in 1998 dollars). Bull et al. (1999) find that MPTs (MBT) were more easily defined than accurately measured. Brozovsky and Cataldo (1994) state that there is a trend toward increasing marginal tax rates and, should it continue, will eventually lead to subsequent increases in MPT. Wiggins et al. (1986) determine that MPTs are incurred primarily by middle- and upper-income couples. Yet recent research shows that MPTs are incurred by all classes of taxpayers and may have the greatest impact on low-income couples (Cook et al. 2001; Smith et al. 1999).

Research on MPT has expanded to several related areas; the impact of tax and transfer programs on social behavior, the effects of changes in tax policy on individual behavior, and attempts to quantify the true costs to society. Using time-series analysis, Alm and Whittington (1995) explored changes in MPT affecting the probability of marriage or divorce. Smith et al. (1999) examined the effect of U.S. tax policies on marital stability – more specifically, how MPT affects American society. Gelardi (1996) investigated the timing of marriages in relation to changes in tax law and found that proposed changes prompted a significant decrease in the number of

marriages occurring in the final half of one year and an unusually high increase in the initial half of the subsequent year, concluding that changes in tax laws do affect individual behavior.

Since marital filing status for federal income tax purposes is determined on the final day of each calendar year, couples planning to marry may plan for the event to take place pre- or post-January 1. Strategically, if only one of the two earns income, the marriage would benefit by occurring on or before December 31 whereas, if both earn income, MPT could be avoided by a post-January 1 wedding, ceteris paribus.

Researchers agree that numerous factors affect the imposition of MPT (MBT). Among these factors are current tax rate schedules, standard deduction, child care credit, earned income tax credit, alternative minimum tax, and individual family situations.

To quantify the net effect of MPT throughout the various changes in tax law, prior studies have empirically calculated average MPTs and benefits (a benefit of lesser tax paid by married couples vs. that paid by two single taxpayers, ceteris paribus) among all income groups per bracketed amount. After comparing the net MPT with the net MBT, a "real" net MPT was calculated. Exhibit 2 reports a summary of the net MPT for the period 1980 – 1999.

Exhibit 2: Net Marriage Penalty Tax Based on Prior Research

Study / year published [tax act]	Tax Year	Average Penalty % and $	Average Benefit % and $	Net Penalty
OTA 1999	1999	48 and $1,141	41 and $1,274	$31
CBO 1997	1996	42 and $1,380	51 and $1,300	-
CBO 1997 (all itemized)	1996	47 and $1,750	49 and $1,350	-
Alm and Whittington 1996	1994			$375*
Feeberg and Rosen 1995 [OBRA 93]	1994	51 and $1,244	38 and $1,399	$124*
Feeberg and Rosen 1995	1993	51 and $898	38 and $1,577	$(143)*
Rosen 1987 [TRA 86]	1988	40 and $1,091	53 and $609	$119**
Rosen 1987	1986			$529**
Alm and Whittington 1996	1980			$300*

* 1994 dollars and ** 1988 dollars

Consistent with prior research, Holtzblatt and Reberlein (2000) measured the effect of the earned income tax credit (EITC) on MPT (MBT) by employing a 'resource pooling' measurement method using the Treasury Department's Individual Tax Model (a micro-simulation model based on the Statistics of Income sample of tax returns for 1995). The effect on the married filing jointly income tax returns for the 2000 tax year (stratifying the results into five classes by adjusted gross income) was determined and, subject to various assumptions, it was estimated that MPTs would

increase by at least $3.1 billion (10.4 percent) while MBTs would decrease by $439 million (1.5 percent). The most notable effect on MPTs occurs in situations where couples are ineligible for EITC because their combined incomes exceed $30,000 (maximum phase-out).

Feenberg and Rosen (1995) utilized a Tax Simulation Model (TAXSIM) maintained by the National Bureau of Economic Research to test a stratified random sample (96,589) of tax returns filed in 1989 and 'aged' the data using a nominal per capita income growth, consistent with Congressional Budget Office (CBO) predictions, to 1993/1994 levels. Further, since the original data did not indicate the division of the earnings by couples, family earnings were divided between the husband and wife using assumptions and data obtained from the March 1990 Current Population Survey (CPS) thus separating the joint liability of the couple into two separate liabilities. Assumptions also were made for the division of passive income, dependents, and other factors.

Using 1996 tax data, the U.S. CBO (1997) found that among married couples, a significant increase in two wage-earner households occurred in the last two decades. CBO also found that there was increasing equality of the incomes of marriage partners, particularly in households with higher incomes, contributing to a substantial increase in the share and magnitude of couples incurring MPTs. CBO estimated that 42 percent of couples had an average MPT of roughly 2 percent of adjusted gross income (range 7.6% - 1.6%) with higher estimates calculated if itemized deductions and dependents were assigned to the higher income spouse (based on a hypothetical divorce).

Prior research also considers the effect of changes in tax policy on the behavior of individuals and their decision to marry, such as, how MPT affects single couples contemplating marriage (or possible postponement – temporarily or permanently) and/or married couples contemplating divorce. Moffit et al. (1998) report strong evidence that economic considerations in the welfare system favor unmarried individuals encouraging low-income partners to cohabitate rather than marry, resulting in possible socially detrimental consequences on children, as discussed later in this paper.

Sjoquist and Walker (1995) examined the impact of MPT on the rate and timing of marriage. Alm and Whittington (1995, 1996, and 1999) concluded that an increase in MPT of $465 decreases the probability of an initial marriage for low-income women by approximately 3% whereas, for wealthy professional couples, an increase in MPT (up to 99%) could decrease the probability of initial marriages by as much as 23%.

Researchers also attempt to identify and quantify the "true" long-term cost to society associated with changes in public policy and measure the impact of these changes on human behavior. Smith et al. (1999) provide an analysis of the impact of societal ethics, cultural trends, divorce law and public policies on marriage. They posit that public policy (i.e., tax and transfer programs) may affect marital stability and state an expectation that government policy would be more pro-child, pro-marriage (or at least neutral to marriage) and advance legislation that promotes marriage. It is estimated that MPTs cost American married couples approximately $33 billion in the year 2000, an explicit tax cost to married taxpayers and their families (Olshewsky et al. 2001).

Researchers have attempted to ascertain the 'true' cost to society of reducing marriage, that is, the costs of federal, state, and local governmental programs necessary to offset negative societal consequences. For example, studies have shown that children in single-parent homes have a higher probability for negative social outcomes such as under-education, delinquency, and incarceration (Demuth and Brown 2004; Olshewsky et al. 2001; Smith et al. 1999). Consequently, it may be argued that this places an increased burden on society to support public and private organizations that maintain related rehabilitation programs and infrastructure. Research by Alm and Whittington (1995, 1996, 1999) and Sjoquist and Walker (1995) suggests that reduction or elimination of MPT may assist in changing human behavior.

Researchers posit that public policy can alter human behavior. Unfavorable tax consequences of marriage were associated with divorce and lower marriage rates (Smith et al. 1999; Keely 1987). A theory underlying these findings is that the extra tax burden is a financial stress and, such causes marital difficulties that ultimately may contribute to divorce. Again, the damaging effect of MPT has a greater impact on lower income families. MPT not only discourages contemplated marriages, but also may present a danger to existing unions.

Prior research confirms that MPT is disruptive to marital stability and society. Extensive research indicates the need of children for stability. When home life is destabilized, a significant decline in child well-being indicators such as school performance and behavior problems occurrs (USA Today 2005). Children in two-parent homes are two to three times less likely to have emotional problems, and boys are less likely to participate in crime (Colson 2005). The link between home environment and crime is well documented (Demuth and Brown 2004; Morse 2003; Olshewsky et al. 2001; Jackson 1997). Between 67 and 75 percent of all prison inmates were not raised in a two-parent home. In certain juvenile correction systems, for example Wisconsin, the number is approximately 90 percent (Colson 2004).

A consequence of MPT is that it may discourage marriage (Alm and Whittington 1995, 1996, 1999). If the unmarried taxpayer becomes a single-parent, this may lead to greater challenges in child-rearing. Compounding this problem is the assertion that the tax code provides financial incentives to taxpayers to have and raise children outside of marriage. A favorable filing status, child credit, and a higher scaling of the EIC, are all available to single taxpayers. As such, the current tax system may encourage a single-parent family or unmarried two-parent family, impacting on adults, children, and society. Reducing the marriage rate may be an unintended consequence of our current tax system. Elimination or at least minimization of MPT would be a step toward correcting this unintended consequence.

If we examine the nature of the earnings distribution within families to determine which couples specifically incur MPTs, we note instances where married couples pay higher taxes than unmarried couples, even when the income levels of the couples are the same. In families where married spouses have greater differences between the earnings of husband and wife, the MPT is less than in instances where the husband and wife earn similar amounts of income.

RESEARCH DESIGN AND HYPOTHESIS DEVELOPMENT

The objectives of this paper include determining whether a shift in the amount and the distribution of MPT (MBT) occurs between the tax laws in effect prior to EGTRRA 2001 and the changes enacted by JGTRRA 2003. By obtaining population data from income tax returns filed for the year 2000, directional sign predictions are made based on the changes expected using the criteria from the most recent tax act. In terms of estimating the income-split between husband and wife, the methodology used is similar to that employed by Feenberg and Rosen (1995). The key difference between this and earlier studies, including Feenberg and Rosen (1995), is that aggregate population data, rather than sample data is used. A decrease in the amount and distribution of MPT is anticipated as a result.

In addition to the changes enacted in JGTRRA 2003, a shift in the proportion of two-wage earning families also affects the distribution of MPT. Population data of individual tax returns filed for 2000 is available from the Statistics of Income (SOI) Division of the IRS. Using this data, the analysis is useful in approximating and quantifying MPT under the pre-2001 and 2003 tax acts and stratifying the effect across the various tax rate brackets of married filing jointly taxpayers. Consistent with prior research, this study uses actual income tax return data. Population data will also be obtained from the 2000 Census Bureau Current Population Survey (CPS) to evaluate the impact of the tax law changes on the MPT to CPS earnings.

The research questions are as follows, as stated in the alternate form:

RQ1: What is the change between the net effect of the MPT in year 2000 and the projected net effect of the MPT as the result of JGTRRA 2003?

Congress specifically intended to focus on a substantial reduction in MPT. Thus, Research Question 1 posits that there should be empirical evidence of a decreasing shift or complete elimination in MPT situations resulting from the new tax act.

RQ2: What is the change between the distribution of MPT in year 2000 and the projected distribution of MPT throughout all classes of jointly filed income tax returns as the result of JGTRRA 2003?

Research Question 2 addresses the distributional effects between income brackets and assesses the fairness (e.g. horizontal equity) of the reduction in MPT. If Congress truly intended to maintain horizontal equity among various classes of taxpayers, there should be evidence of parity between taxpayers of similar classes of income.

METHODOLOGY

As described earlier, this study utilizes population data from the SOI Division of the IRS and the 2000 CPS data. SOI data consists of tax returns filed by married filing joint taxpayers for the year 2000. Base year tax liabilities are calculated and verified using the tax law in effect for 2000 and then compared to the tax liabilities as re-calculated under JGTRRA 2003. Then, consistent with prior research, the income, deductions, and dependents of the married couple are split according to various assumptions and the tax liabilities of the couple are recalculated as that of two separate single individuals.

Since SOI data does not contain specific information as to the division of income and expenses between spouses, CPS data is employed to allocate consistently the various items of income, expenses, dependency deductions, credits, and other items. CPS data is provided on a monthly basis and is derived from a collaboration of data between the Bureau of Labor Statistics and the Bureau of the Census. CPS data contains employment, earnings, and demographic data. Use of CPS data is important to this study since, when splitting the income and deductions between spouses, certain assumptions must be made. Allocation assumptions in earlier studies divided various individual tax items via a strategy whereby the dependents and deductions were awarded to the spouse with the higher income. This study allocates dependency exemptions and deductions in accordance with the symmetry found in the CPS data.

DATA AND ANALYSIS

In a study of education, employment, health costs, and crime levels (socioeconomic status), Olshewsky et al. (2001) approximate, through a series of extrapolations, that the elimination of MPT could reduce the number of single-parent families by as much as 36%. Hypothetically, the government would give up $33 billion in tax revenues from the MPT but may save even more in curtailment of direct and indirect social program expenditures (e.g. drug rehabilitation and prison facilities). Of greater importance is the impact on the people, arguably a happier, better adjusted society as a whole.

To maintain integrity of the findings and extrapolate the effect of net MPT to the population, income levels representative of comparable income tax brackets for pre- and post-JGTRRA were combined. Using SOI data, Yau, et al. (2004) chose midpoints of the income intervals to represent the average taxpayer for that group. This data also provides the number of men and women who filed joint income tax returns, the corresponding gross amount of income reported for each group, and thus, average salaries and wages for men and women taxpayers were calculated for each interval. Exhibit 3 presents an extrapolation of the data by income interval, number of men and women taxpayers, total income, average income, and provides a percentage mix of the earnings between spouses in jointly filed income tax returns.

Exhibit 3: Distribution of Wages between Husband and Wife in Dual Wage-Earner Families

The distributional effect between men and women was derived by hypothetically "marrying" the average male filing a joint income tax return with the average female who also filed a joint income tax return for each interval and subsequently calculating the proportionate share of earnings for the couple in each interval. The measurement of this distributional 'mix' allows the calculation of MPT for pre- and post-JGTRRA; therefore, our results are comparable to prior research. The net effect of the change in the tax law is extrapolated to the population as a whole, an improvement over prior research that used samples of tax returns filed rather than population data for all returns filed. Consistent with prior research, calculations were performed at the various marginal income tax brackets for pre-JGTRRA in order to determine if a net MPT (MBT) or benefit exists within each income interval, and overall. To calculate the income for those individuals who file on a single basis, income was split between the couples in each interval using the mix derived from the preceding distribution of wage information. Exhibit 4 reports a summary of MPT in each bracket for pre-JGTRRA for a couple filing married filing joint versus single (separately), with zero dependents.

Exhibit 4: Pre-JGTRRA Impact of MPT (MBT) within classes of income by Marginal Tax Bracket, No Dependents
Married Filing Jointly (MFJ) vs Separately (as Single)

Pre-JGTRRA (2000) Marg.Tax Brack. %	Combined Wages	Spouse 1 Husband (% split)* $ split	Spouse 2 Wife (% split)* $ split	Tax liab. M F J Tax due (refund)	MPT or (MBT) M F J vs Single Assume both taxpayers file Single + 0 dep
		(55.2 %)	(44.8 %)		
15%	$10,000	5,520	4,480	$ (27)**	$ 668**
		(59.1 %)	(40.9 %)		
15%	$20,000	11,820	8,180	1,061	388
		(63.7 %)	(36.3 %)		
15%	$37,500	23,888	13,612	3,686	221
		(63.3 %)	(36.7 %)		
28%	$75,000	47,475	27,525	11,681	767
		(66.4 %)	(33.6 %)		
31%	$150,000	99,600	50,400	33,607	1,583
		(74.4 %)	(25.6 %)		
36%	$300,000	223,200	76,800	88,247	5,405
		(77.1 %)	(22.9 %)		
39.6%	$600,000	462,600	137,400	207,357	13,127
		(67.6 %)	(32.4 %)		
Overall avg.	$74,485	50,375	24,110	11,527	311

* Source: Data derived from "Comparing Salaries and wages of Women Shown on Forms W-2 to Those of Men, 1969 – 1999", p.283, IRS, SOI, Jan 2004.
** Due to Earned Income Tax Credit (EITC).

SOI data does not contain specific information as to the division of income and expenses between spouses, thus various assumptions are necessary to assess the magnitude of MPT. Initially, our tests were conducted using data from the 2000 Supplementary Survey Profile of the U.S. Census Bureau. Median earnings for male full-time, year-round workers was calculated as $38,244 (57% of the two-wage earner couple's joint income) and median earnings for female full-time, year-round workers was estimated as $28,720 (43% of the two-wage earner couple's joint income). Also, the Census survey estimated that approximately 52% of all married couples have both spouses in the labor force. Using the 57% husband/43% wife ratio to re-allocate total income between the couples in the single tax calculations to calculate MPT within each tax rate bracket is too simplistic and does not provide a meaningful generalization to the population. The income division percentages within each income interval are used to calculate net MPT.

Exhibit 5 reports the results of MPT for married filing joint couples with zero dependents using 2003 tax rates. The findings indicate that MPT, while substantially reduced, is still very much evident in lower and higher marginal tax rate brackets.

Exhibit5 : Post-JGTRRA Impact of MPT (MBT) within classes of income by Marginal Tax Bracket, No Dependents
Married Filing Jointly (MFJ) vs Separately (as Single)

Post-JGTRRA (2003) Marg. Tax Brack. %	Combined Wages	Spouse 1 Husband (% split)* $ split	Spouse 2 Wife (% split)* $ split	Tax liab. M F J Tax due (refund)	MPT or (MBT) M F J vs Single Assume both taxpayers file Single + 0 dep
		(55.2 %)	(44.8 %)		
10%	$10,000	5,520	4,480	$ (169)**	$ 555**
		(59.1 %)	(40.9 %)		
10%	$20,000	11,820	8,180	443	235
		(63.7 %)	(36.3 %)		
15%	$37,500	23,888	13,612	2,589	(55)
		(63.3 %)	(36.7 %)		
25%	$75,000	47,475	27,525	8,476	(862)
		(66.4 %)	(33.6 %)		
28%	$150,000	99,600	50,400	27,813	(110)
		(74.4 %)	(25.6 %)		
33%	$300,000	223,200	76,800	76,787	3,377
		(77.1 %)	(22.9 %)		
35%	$600,000	462,600	137,400	181,882	9,268
		(67.6 %)	(32.4 %)		
Overall avg.	$74,485	50,375	24,110	8,339	(11)

* Source: Data derived from "Comparing Salaries and wages of Women Shown on Forms W-2 to Those of Men, 1969 – 1999", p.283, IRS, SOI, Jan 2004.
** Due to Earned Income Tax Credit (EITC).

For situations in which couples in two-income married-couple households have more evenly split incomes than on average, substantially higher MPT will be incurred. For example, the average income split for the married couple with combined wages of $37,500 is 63.7 percent for the husband and 36.3 percent for the wife (IRS 2004). However, married couples with $37,500 of combined wages who have a 50-50 income split and would incur an even higher MPT.

Testing of Research Question 1 indicates a significant change (decrease) in overall MPT as the result of JGTRRA 2003, as shown by the decrease in overall average MPT. The change was from an overall average MPT of $311 (Exhibit 4) to an overall average MBT of $11(Exhibit 5).

Testing of Research Question 2 reveals that while there has been an overall reduction in MPT, significant disparity still exists among various classes of income. Differences between MPT for each of the marginal tax rate brackets for pre- vs. post-JGTRRA reveal that, on average, net MPT has decreased, resulting in an overall net MBT in middle income tax rate brackets. On the other hand, MPT was moderately reduced in lower and upper brackets, and the average couple in these brackets still incurs MPT. Furthermore, depending on their income split, some married couples in all income brackets still incur MPT. The closer the income split is to 50-50, the greater MPT.

IMPLICATIONS OF PROVIDING INCENTIVES FOR MARRIAGE

Much tax policy research investigates the application of horizontal equity and its application across various income levels. Conceptually, horizontal equity refers to perceived fairness whereby 'those with equal status or income should be treated equally.' Hence, as it applies to taxes, taxpayers in similar classes of income should pay the same tax and enjoy the same benefits. These benefits conceivably are in the form of goods and services received from the government. Conceptually, a fair or equitable tax policy is one in which the combined income of a married couple would incur the same tax liability as the combined income of two single individuals. However, this is not as simple as it may appear, as calculations are complicated by other factors (such as different tax rate brackets, dependents, and the EITC).

The premise of a government's duty of fiduciary care to its taxpayers and its responsibility to provide its citizens with the optimum utilization of collected revenues and minimization of overall costs raises several issues of concern. In the case of MPT, the impact of the perceived fairness of MPT in providing incentives or disincentives to preserving a two-parent married-couple family unit is one issue. Also related to this issue is whether or not it is fair to allow married individuals to receive MBT, by allowing them to be taxed as if each earned exactly half of their combined income (even when one taxpayer earned all the couple's combined income). This can be regarded as a question of social justice.

A primary justification for eliminating tax disincentives and providing tax incentives that encourage married-couple families is that married couples provide a better environment for raising children, our next generation of taxpayers. Social research describes the benefits of two-parent married couple families (e.g. Demuth and Brown 2004, Morse 2003, Deleire and Kalil 2002, McLanahan 1996). On one side are single taxpayers, who may favor equal taxation of income of all individual taxpayers, married or not. Applying this view would eliminate the married filing jointly option, eliminating not only MPT but also the benefits of taxing combined, and equally apportioned, income associated with the married filing jointly option.

The needs and rights of children must also be considered. Evidence of human history, natural law, and current studies all reveal that the role of spouses in the family is complimentary. Children raised in a two-parent home are much more likely to avoid negative social outcomes such as under-education (McLanahan 1996; Dawson 1991), violent crimes (Parker and Johns 2002), substance

abuse (Deleire and Kalil 2002; Hoffman and Johnson 1998), incarceration (Jackson 1997; Morse 2003), and illegitimate births (Demuth and Brown 2004). Seton Hall University law professor John Coverdale (2007, p. 7) summarizes research on family structure as follows: "[C]hildren raised in intact nuclear families have better outcomes on virtually every index than children raised in any other setting. This is demonstrated by numerous studies based on large national samples over extended time frames that control for other variables such as parents' race, education, and income level."

UNDER-EDUCATION

McLanahan (1996) states that children in single-parent families have poorer school attendance records and lower grades than children in two-parent families. School dropout rates for children in single-parent families are twice that of those in two-parent families. Further, children from single-parent homes are less likely to graduate from college and more likely to become single-parents themselves. McLanahan, a single parent herself, developed an interest in this research in an attempt to support her conviction that single parents do "just as good a job of raising children as married moms." She concluded, however, that evidence overwhelmingly indicates that, on average, children do much better in two-parent families.

Research has also demonstrated that children from broken homes perform more poorly in reading, spelling, and math, are more likely to repeat a grade, have higher dropout rates, and lower rates of college graduation. As compared to children from two-parent families, those from single-parent or broken homes exhibit more conduct problems and symptoms of psychological mal-adjustment, lower academic achievement, social difficulties, and poorer self-concepts (Massachusetts 2004). Dawson (1991), in her review of the National Health Interview Survey of Child Health, reported that "children from disrupted marriages were over seventy percent more likely than those living with both biological parents to have been expelled or suspended." Children from broken homes are twice as likely as those from intact families to drop out of school and more likely to exhibit more health, behavioral, and emotional problems, become involved in crime and drug abuse, and have higher rates of suicide (Zill et al 1993).

VIOLENT CRIMES

Researchers have studied the relationship between family structure and delinquency. In 1925, researchers interested in juvenile delinquency found that almost twice the number of institutionalized (or delinquent) youths came from broken homes (Burt 1925). Criminology literature reveals that family is an essential source of community, providing stability and supervision to form a barrier against violence and that children from broken homes are more delinquent than those from intact families. Parker and Johns (2002) posit that family is a mechanism of social

control and an essential element in reducing crime (specifically homicide). They identify constructs of social control occurring in cases of family disruption (i.e., divorce and single-parent households).

SUBSTANCE ABUSE

In addition to experiencing lower educational achievement and higher involvement in crime, studies have found that children from broken or single-parent homes are more likely to engage in drug and alcohol abuse. Using data from the National Educational Longitudinal Study, Deleire and Kalil (2002) observed that teenagers from single-parent families were more likely to initiate smoking or drinking, and initiate sexual activity, but less likely to graduate from high school or to attend college than those from two-parent families. Hoffman and Johnson (1998) concluded that children in traditional two-parent home environments engaged in fewer harmful behaviors such as, delinquency, substance abuse, premarital sex, and suicide.

INCARCERATION

Research indicates that incarceration of one (or both) parents has particularly detrimental consequences to the future development of children. Colson (2004) states that more than half of prison inmates are from broken families. Role models (father and mother) are moral influences that inform the child's consciences early in life; thus, any influence that causes family breakdown is likely to increase social disorder and crime.

In *Parents or Prisons*, Morse (2003) speculates that for some, prisons are substitutes for parents but, obviously, poor substitutes for caring, nurturing parents. She states that without two parents, a child is more likely to end up in the criminal justice system at some point, and the prison will perform the parental function of supervising and controlling behavior. Basic development of self-control, reciprocity, conscience, trust, and empathy takes place in the family units. Morse comments that a free society must have people with consciences. The great majority of people obey laws voluntarily. If citizens fail to conform to the law, they must be compelled to do so or the public protected when they do not. Thus, lacking two parents, a typical child has greater difficulty learning the moral basics. Colson (2006) indicates that failure to teach moral basics to children is a key reason for the ten-fold increase in the U.S. prison population (from 230,000 in 1976 to 2.3 million in 2006 – a period in which the U.S. population increased by about 50 percent). The U.S. now leads the world in per capita prison incarceration.

Morse (2003) provides an analysis of the estimated cost of incarceration to society. Using California as an example, the Department of Corrections allocation accounted for approximately six percent ($5.2 billion) of the entire state budget in 2002-2003. On a per capita basis, this was approximately $26,700 per adult inmate per year and $49,200 per juvenile offender per year. She poses an interesting question: What if minors in the juvenile system were functioning well enough

that they could be a normal part of society and thus a part of the educational system rather than the juvenile delinquency program – how much would this save the taxpayers?

Morse (2003) extrapolates that taxpayers pay about $8,568 per year per student K-12, $4,376 per year per student at a community college and $17,392 per year per student in the University of California system, concluding that exchanging school for prison yields tremendous savings for society. Of course, society receives many additional benefits from reduced crime, such as the tangible economic savings from reduced theft and robbery. In addition, they are numerous intangible benefits, such as people no longer living in fear of becoming a victim of crime, as well as the benefit to those who live a productive rather than a criminal life.

ILLEGITIMATE BIRTHS

More than half of all children will spend at least some time in a single-parent family. Using data from the 1995 National Longitudinal Survey of Adolescent Health, Demuth and Brown (2004) estimate that nearly a third of all children are born to unmarried mothers. Constructs through which living with a single parent increases delinquency and indicate that adolescents in single-parent families are more likely to engage in more serious forms of harmful behavior.

Then-Vice-President Dan Quayle sparked controversy when he criticized the television series Murphy Brown depicting a child born out of wedlock (CNN 2002). The trials and tribulations of a single-parent female role model were portrayed and controversy regarding traditional family values and concerns of raising a fatherless child were prompted. McLanahan (1994) found that children raised by a single parent are disadvantaged across a broad array of outcomes. These children are twice as likely to drop out of high school, two and a half times more likely to become teen mothers themselves, and one hundred-forty percent more likely to be idle (out of school and out of work) as are children who were raised by two parents. She adds that children from single parent families also have poorer school attendance records, lower grades, lower college aspirations, and, as adults, higher rates of divorce.

McLanahan (1996) points out that out-of-wedlock births have increased in the U.S. since the 1940's and suggests that more should be done to assist parents with the costs of raising children. She emphatically states that a better way to encourage marriage is to make certain that parents are not penalized for marriage, but our current system of income transfers and taxation does just that. The issue that must be addressed is why MPT continues to be imposed.

Many believe that eliminating MPT, and allowing a benefit (i.e., taxing a married couple's combined incomes apportioned equally under the married filing jointly option) results in social justice. Eliminating MPT strengthens the married two-parent family and advances society's ability to raise future generations of citizens. An unmarried cohabiting couple also provides children with two parents, but statistics indicate that half of cohabiters break up in five years, while only 15 percent of married couples separate during this period (USA Today 2005).

Estimated costs to society associated with the criminal justice system, prison facilities, substance abuse treatment, lost productivity, and under-education attributable to single-parent households have been estimated to exceed $300 billion (Olshewsky et al. 2001). Eliminating MPT is expected to strengthen two-parent households and thereby reduce the number of children in single-parent households.

Overwhelmingly, research indicates the benefit to children of two-parent married-couple households over single-parent households. In addition, the benefits of marriage extend beyond the well-being of children. Warren (2003) indicates that married persons are better off emotionally, physically, financially, and vocationally than are unmarried partners. Adults benefit from marriage, regardless of whether or not they are parents. Essentially, strengthening marriage, by eliminating MPT, is beneficial to children and adults.

LIMITATIONS, CONCLUSIONS AND FUTURE RESEARCH

While researchers calculate and measure the impact of a change in tax law on MPT among various classes of taxpayers, it is difficult to ascertain the exact impact of MPT on marriage. Further, division of income and deduction items found in this body of research is based on various assumptions and, as plausible as these assumptions may seem, they are nevertheless estimates of what could occur, not necessarily what does occur. Additionally, in attempting to estimate the overall true cost to society as the result of tax changes, it is difficult to precisely extrapolate those results to the population as a whole.

Many regard the marriage penalty tax as contradictory to American values and general principles of fairness. Survey data and anecdotal evidence indicate that most people believe MPT should be eliminated. Results of this study indicate that while a significant reduction in MPT has occurred, substantial disparity still remains throughout various class of income. Taxpayers in the lowest and highest marginal income tax rate brackets received smaller benefit and taxpayers in the middle marginal income tax rate brackets received greater proportional benefit. Congress has voiced publicly its intention to substantially reduce the inequity of MPT. Perhaps Congress can do so on a 'net' basis but so far has been unable to accomplish this objective throughout all classes of income. This study confirms that MPT continues to exist for many married taxpayers. To make matters worse, current reductions in MPT will 'sunset' or expire after 2010, unless Congress votes to extend provisions of JGTRRA.

The family is widely regarded as the foundation of our civilization (Hagelin 2007, Colson and Fickett 2005; Colson 2003; Olshewsky et al. 2001, Smith et al. 1999). Considering the positive aspects of marriage on society -- stable family structure, emotional health of children, and physical health of adults (with or without children), placing a higher tax burden on married couples appears contrary to the best interests of the nation. Tax researchers may posit that while there are some couples who pay MPT, this is offset by other couples that receive MBT. While this may be true, it is little consolation to the marriages negatively affected by the MPT. Based on this research, one can

infer that the MPT via Congress is harming marriage and the best interests of society, both children and adults. The future of American civilization will largely depend on the vitality of marriage and the family. The MPT is detrimental to both. Families are the foundation of civilization; when families fail, civilization collapses. In the final analysis, the MPT is anti-family and thereby anti-civilization.

Perhaps this study will stimulate further interest in determining the impact of changes in tax policy on behavior and the public and social costs associated with MPT. Our work may be extended by utilizing various assumptions for re-allocation of tax variables including income, expense, and dependents. Division of these items may affect the impact of changes in tax law. Calculations involving the separation of the taxpayers from married to single/head of household may involve assigning the dependents to the highest wage earner, or to the wife, or splitting them equally among separating ex-spouses. Similarly, income and expense items could be re-allocated among separated taxpayers.

Ultimately, if Congress wishes to maintain revenue neutrality, alternate sources of revenue must be considered. Researchers might investigate other potential sources of tax revenue to replace that lost by the minimization or elimination of MPT.

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