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# ACADEMY OF ACCOUNTING AND FINANCIAL STUDIES JOURNAL

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## LETTER FROM THE EDITORS

Welcome to the *Academy of Accounting and Financial Studies Journal*, an official journal 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 *AAFSJ* is a principal vehicle for achieving the objectives of the organization. The editorial mission of this journal is to publish empirical and theoretical manuscripts which advance the disciplines of accounting and finance.

Dr. Janet Dye, University of Alaska Southeast, is the Accountancy Editor and Dr. Denise Woodbury, Weber State University, is the Finance Editor. Their joint mission has been to make the *AAFSJ* better known and more widely read.

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.

Information about the Allied Academies, the *AAFSJ*, and the other journals published by the Academy, as well as calls for conferences, are published on our web site. In addition, we keep the web site updated with the latest activities of the organization. Please visit our site and know that we welcome hearing from you at any time.

Janet Dye, University of Alaska Southeast

Denise Woodbury, Weber State University

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## **MANUSCRIPTS**

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# DO STATES OPTIMALLY SET TAX RATES? THE PORTFOLIO APPROACH VS. THE TAX SMOOTHING HYPOTHESIS

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Jennifer Troyer, University of North Carolina at Charlotte

## ABSTRACT

*There are two strands of literature addressing optimal taxation. One, using a portfolio approach, assesses to what degree a tax system balances tradeoffs between revenue growth and stability. The second strand of literature of optimal tax theory, the tax smoothing hypothesis (TSH), claims that changes in tax rates should be unpredictable in order to minimize the excess burden of the tax. This paper considers both theories to determine if there is any overlap of the "requirements" for optimization. For example, are states with a tax portfolio offering high revenue growth and stability also able to smooth tax rates? Results show there appears to be little connection between the two conditions for optimal taxation.*

## INTRODUCTION

There are two strands of literature addressing optimal taxation. One, using a portfolio approach, assesses to what degree a tax system balances tradeoffs between revenue growth and stability.<sup>1</sup> (White, 1983; Harmon & Mallick, 1994; Gentry & Ladd, 1994; Braun & Otsuka, 1998). This approach examines how a state's mix of revenue sources (sales, property, income and other tax types) situates the state along a tax efficiency frontier. In general, a tax portfolio that provides both high revenue growth and low variability is deemed an optimal combination. The second strand of literature of optimal tax theory, the tax smoothing hypothesis (TSH), claims that changes in tax rates should be unpredictable in order to minimize the excess burden of the tax. This approach does not consider revenue sources or a tax efficiency frontier. Instead, a basic level of this research has examined the stationarity of tax rates (Barro, 1979; Sahasakul, 1986; Strazicich, 1996; Strazicich, 1997; Dole, 2000) at the state and federal levels. Extending the basic assumptions of the TSH, optimal taxation has also been tested using the relationship between changes in government spending, tax rates and budget balances. (Ghosh, 1995; Olekalns, 1997; Cashin, et al, 1998).

This paper considers both theories to determine if there is any overlap of the "requirements" for optimization. For example, are states with a tax portfolio offering high revenue growth and stability also able to smooth tax rates? Or does the desire for high revenue growth and stability hamper a state's ability to vary tax rates unpredictably? We use state-level data from 1966 through 1999. After computing revenue growth rates and variability, the states are grouped into quadrants based across spectrums of high to low growth and high to low variability. To examine the relationship between these groups (which account for the portfolio approach's standards) and the TSH requirements, we use an extension of the TSH suggested by Ghosh (1995) and Olekalns (1997).

Results show that only two states are smoothing according to the TSH and that only one falls into high revenue-low variability quadrant as proposed by the portfolio approach. That is, there appears too little connection between the two conditions for optimal taxation.

The remainder of the paper is organized as follows: a review of the two optimal taxation theories, a description of the data, regression analysis, and a summary.

## **THE PORTFOLIO APPROACH**

The portfolio approach to taxation follows from finance literature and was adapted initially by White (1983). This approach constructs a tax efficiency frontier that shows the tradeoff between revenue growth and predictability (or stability) for a state's tax structure. States' tax structures are then compared to this frontier to determine how close their portfolio of taxes (income, sales, property, etc.) is to the optimal frontier (Harmon and Mallick, 1994; Gentry and Ladd, 1994, Braun and Otsuka, 1998). A shortcoming of this line of research is that most of it examines a state's portfolio for only one year; there is no time series approach investigating how this portfolio behaves over time.<sup>2</sup>

## **AN EXTENSION OF THE TAX SMOOTHING HYPOTHESIS**

Barro (1979) claims that to minimize the distortions of taxes, an optimal tax rate should vary unpredictably. Research, conducted at both the federal and state levels, produces conflicting results. (Sahasakul, 1986; Strazicich, 1996; Strazicich, 1997; Dole, 2000). A further implication of the TSH, presented in Olekalns (1997), is that the budget surplus should be stationary and that expected future changes in government spending impact the behavior of the budget surplus. That is, there is a link between the budget surplus and expected changes in government spending. These links are tested in Olekalns (1997) using Australian federal data. Results reveal differences between the theoretical optimal budget surplus and the actual surplus leading Olekalns to conclude that tax rates in Australia have been too volatile and tax smoothing does not occur. A similar study using Indian data (Cashin,

et al. 1998) shows evidence of tax smoothing by the federal government but not by regional governments.

### TESTABLE IMPLICATIONS OF THIS EXTENSION

Following Ghosh (1995) and Olekalns (1997) a formal model of tax smoothing is developed. This model is presented in the appendix. From this model of tax smoothing, several testable implications result. First, the budget surplus should be stationary. This follows from the fact that the budget surplus, being a linear function of changes in government expenditures, should also be stationary. This assumes that government expenditures are nonstationary. Secondly, the budget surplus should Granger cause changes in government expenditures. This follows from the idea that changes in the budget balance signal changes in future government expenditure. And third, the optimal budget surplus (which occurs if taxes are smoothed) should vary with the actual budget surplus by only a random sampling error. These implications are tested for each state.

### DATA AND METHODOLOGY

Data are collected for each state from 1966 through 1999, the latest available. The data include gross state product; average tax rates (tax revenues/gross state product); average interest rate for each state (interest payments/outstanding debt); and government expenditures for each state. The inflation rate, based on the CPI, is used to put the nominal interest rate in real terms.

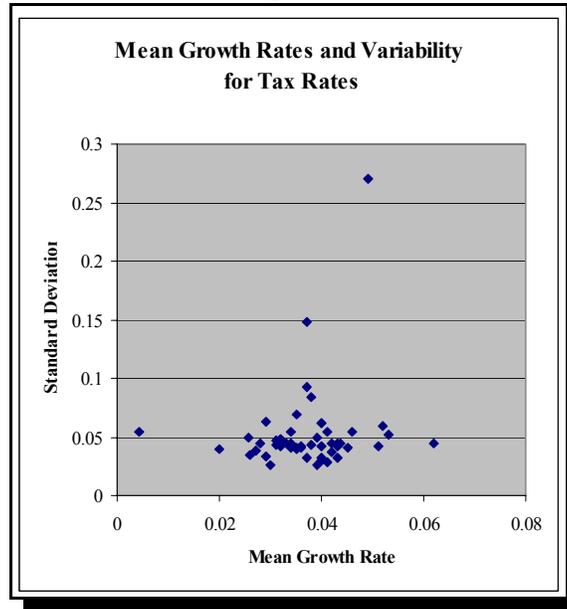
The first task is to calculate the growth rate of tax revenues for each state using:

$$dR_{i,t} = k_i + e_{i,t}$$

where R is the log of real revenues and k is the estimated growth rate. The stability of tax revenues is based on the standard deviation of the error term, e. The greater the variation, the less stable (or less predictable) are tax revenues.

According to the portfolio approach, a mix of tax revenues that delivers high revenue growth rates along with stability is preferred.<sup>3</sup> After calculating mean growth rates and standard deviations for each state, each state is placed in a quadrant in growth-stability space. Figure 1 shows each state's location in the space.

We then calculate the mean growth rate and standard deviations for the states and use these as the basis for our quadrants. Table 1 lists the quadrants and the states. Quadrant IV includes those states with the highest growth rates and lowest variability, the optimal location according to the portfolio approach.

**Figure 1**

The quadrants are divided based on the average growth rate (0.037) and the average standard deviation (0.052).

<b>Table 1: States and Quadrants</b>	
Quadrant 1 (low mean growth rate and low variability)	
Alabama	New York
Delaware	Ohio
Indiana	Oklahoma
Iowa	Rhode Island
Kansas	South Dakota
Louisiana	Tennessee
Maryland	West Virginia
Mississippi	
Missouri	
Montana	

<b>Table 1: States and Quadrants</b>	
Quadrant 2 (low mean growth rate and high variability)	
Illinois	
Michigan	
Nebraska	
North Dakota	
South Dakota	
Quadrant 3 (high mean growth rate and high variability)	
Connecticut	New Mexico
Maine	Wisconsin
New Hampshire	Wyoming
New Jersey	
Quadrant 4 (high mean growth rate and low variability)	
Alaska	Massachusetts
Arizona	Minnesota
Arkansas	Nevada
California	North Carolina
Colorado	Oregon
Delaware	Texas
Florida	Utah
Georgia	Vermont
Hawaii	Virginia
Kentucky	Washington
Idaho	

The next step is to test each state in accordance with the TSH. Prior to testing the specific components of the TSH, we must first remove the effects of possible tax tilting. Tax tilting refers to states' preferences for a periodic running surpluses or deficits that would abstract from an overall use of tax smoothing behavior.<sup>4</sup> By removing the nonstationary component of the budget balance due to tax tilting, the result provides the stationary, tax-smoothing portion of the budget balance. As derived in the appendix, we estimate the smoothed budget surplus

$$su_t^{sm} = \gamma^{-1} \tau_t - g_t - (r - n) d_t$$

where  $\Upsilon^{-1}$  is the tax tilting parameter,  $t$  is the average tax rate,  $g$  is the normalized government spending,  $r$  is the real interest rate,  $n$  is the growth rate of real GDP and  $d$  is normalized debt.<sup>5</sup> The practical implications of the equation are that if the government expects its spending plans to decrease in the future, the budget surplus will be smaller today. In order to smooth tax rates (and hence decrease the surplus), the government will decrease tax rates in the current period. Likewise, if the government expects a need for increased revenues, it will start building the surplus in the current period by raising tax rates now instead of waiting until the actual increased budget is required. Assuming that the surplus is a stationary series resulting from regressing  $[g_t + (r - n)d_t]$  on  $\tau_t$  where  $g$  and  $\tau$  are nonstationary series,  $\gamma^{-1}$  is a cointegrating vector.

Once the tax-tilting parameter is accounted for, the specifics of the TSH must be addressed. First, changes in the each state's average tax rate ( $\tau$ ) should be unpredictable (or the average tax rate should follow a random walk). The TSH also implies that, given nonstationary government expenditures, the budget surplus will be stationary as it depends on the first differences of  $g$ . Using an augmented Dickey-Fuller test, the following variables are tested for stationarity:  $\tau$ ,  $g$ ,  $dg$ , and  $sur^{sm}$ .<sup>6</sup> According to the TSH,  $\tau$  and  $g$  should be  $I(1)$  while  $dg$ , and  $sur^{sm}$  should reject the null hypothesis of nonstationarity. Table 2 lists the 16 states that are eliminated from the sample because they failed one of the four stationarity tests.<sup>7</sup>

Arkansas
Idaho
Indiana
Kansas
Maryland
Massachusetts
Mississippi
Missouri
Nevada
New York
Pennsylvania
Rhode Island
Tennessee
Utah
Washington
Wisconsin

The second phase of the TSH tests includes the remaining 34 states. According to the theory, the behavior of the budget surplus signals future changes in government spending. The Granger causality test is based on

$$\Delta g_t = \sum_{i=1}^p \alpha_i \Delta g_{t-i} + \sum_{i=1}^p B_i \text{sur}_{t-i}^{\text{sm}}$$

where the F-statistic confirms whether the surplus provides any predictive power for changes in government spending., considering the role past changes in government spending play. Table 3 shows results from Granger causality testing for each state. Lags for  $\alpha$  and  $\beta$  are chosen by minimizing the Bayes Schwarz Criterion. The null hypothesis is that  $B=0$ , or that the budget surplus does not predict changes in government expenditures. The table shows that only 4 states reject the null and therefore exhibit tax smoothing behavior. The remaining states (those states whose budget surpluses do not Granger cause changes in  $g$ ) are eliminated from the sample.

The final phase of the TSH tests examines how close the optimal budget surplus is to the actual budget surplus. Under the null hypothesis, the surplus contains all of the known information on future changes in government expenditures. These forecasts are generated using a bivariate VAR in  $\Delta g_t$  and  $\text{sur}_t^{\text{sm}}$ . A formal test compares where  $\text{sur}^{\text{sm}}$  is the surplus under tax smoothing and  $\text{sur}^{\text{sm}}$  is the actual budget surplus. The joint restriction is that  $\lambda_1=0$  and  $\lambda_2=1$ . Non-rejection (using a Wald test) implies that states are tax smoothing. Table 4 shows results for the Wald test on parameter restrictions for the remaining four states. Ohio (low growth rate and low variability) and Oregon (high growth rate and low variability) are the only states that meet the conditions of tax smoothing.

Overall, it appears that optimal taxation as defined using the TSH is not attained by most states. Given that the efficiency frontier minimizes variability for a given growth rate, there appears to be little relationship between this goal and the TSH.

## CONCLUSIONS

Two different standards for optimal taxation exist. One uses a portfolio approach proposing that there is a certain mix of taxes that offers maximum growth along with minimal variability. The other approach claims that changes in the tax rate should be unpredictable. Along with this result, other implications follow. Specifically, the budget surplus should Granger cause changes in government spending and the optimal budget surplus should closely track the actual budget surplus.

There are 20 states that fall into the category of high revenue growth and stability. Of these states, only one appears to smooth taxes according to the TSH. Does the goal of optimal taxation under the portfolio approach hamper a state's ability to change tax rates unpredictably? Other

factors, like states' choices to have a more equitable or more competitive tax structure could explain the results as well as the fiscal environment under which a state operates could explain this outcome.

### NOTE

We would like to thank Mark Rush, Ben Blair and Kurt Henry for their helpful comments and assistance.

### ENDNOTES

- <sup>1</sup> Some papers also include equity and competitiveness.
- <sup>2</sup> In an initial version of this paper, the role of specific tax revenue sources was examined. Average growth rates for income tax revenues from specific sources could vary from 11% to 43%, for example. Because of the instability of different revenue sources, we chose to focus on total tax revenues. The portfolio approach's cross-sectional data sets free it from this problem. Obviously, when considering only one year, the variation in revenues across sources over time does not occur; however, the approach then also misses the fact that these revenue sources can vary a great deal. So while a state might be close to the frontier one year, it could be far from it the next.
- <sup>3</sup> The portfolio approach typically considers the mix of revenue sources for a state. Using constrained minimization problems, an efficiency frontier is developed in growth-instability space showing policy makers how specific mixes of taxes fit along the frontier. Instead of developing a frontier for each state, we develop quadrants in growth-stability space.
- <sup>4</sup> For example, Alesina and Perotti (1995) explain that a governor may purposely pass on a deficit to an incoming governor to impede new policies. If state governments are prone to tax tilting, we need to remove this component from the analysis. The parameter varied across states, but were unrelated to the questions addressed in this paper and so are not reported. They are available upon request.
- <sup>5</sup> The surplus variable is the residual from equation (10) in the appendix.
- <sup>6</sup> The surplus variable's stationarity test is based on Engle and Granger's (1987) distribution.
- <sup>7</sup> In order to save space, individual state results are not reported in the table, but are available upon request.

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<b>Table 3 - Granger Causality Test</b>											
Results for dg as a function of lagged dg and lagged $sur_t^{sm}$											
State	quad	Lag Lgt	apha1	alpha2	alpha3	beta1	beta2	beta3	computed F	p value for F test	Sursmt granger causes dg?
AL	1	2	-1.614 (0.605)	-0.2981 (0.153)		-1.4317 (0.533)	1.4177 (0.533)		4.5002377	0.0209745	yes
DE	1	1	0.0828 (0.191)			-0.005592 (0.020)			0.0349986	0.9656505	no
IA	1	1	-0.1187 (0.188)			-0.0163 (0.015)			0.563328	0.5758594	no
LA	1	1	0.1127 (0.187)			-0.002568 (0.006)			0.991024	0.9059778	no
MT	1	1	0.1399 (0.188)			-0.0153 (0.014)			0.5838031	0.5646595	no
Ohio	1	2	-1.4302 (0.603)	0.0794 (0.195)		-1.4923 (0.527)	1.4698 (0.526)		5.3371651	0.0114273	yes
OK	1	3	-1.2423 (0.569)	-0.7649 (0.590)	0.5566 (0.199)	-1.0053 (0.445)	0.4896 (0.581)	0.5087 (0.452)	3.1291022	0.0612632	yes
SD	1	1	-0.2197 (0.181)			-0.002825 (0.010)			0.039111	0.9616983	no
WV	1	1	0.0571 (0.186)			-0.0213 (0.013)			1.23777	0.305968	no

<b>Table 3 - Granger Causality Test (continued)</b>											
Results for dg as a function of lagged dg and lagged $sur_t^{sm}$											
State	quad	Lag Lgt	apha1	alpha2	alpha3	beta1	beta2	beta3	computed F	p value for F test	Sursmt granger causes dg?
IL	2	1	0.2057 (0.186)			-0.012 (0.017)			0.2375032	0.7902245	no
MI	2	1	0.0284 (0.191)			-0.018 (0.018)			0.4481763	0.6434586	no
NE	2	1	-0.0161 (0.190)			-0.0232 (0.014)			1.2453059	0.3038644	no
ND	2	1	-0.1989 (0.193)			-0.009973 (0.021)			0.1081097	0.8979157	no
SC	2	1	0.1741 (0.191)			-0.0126 (0.017)			0.2726002	0.7634677	no

<b>Table 3 - Granger Causality Test (continued)</b>											
Results for dg as a function of lagged dg and lagged sur <sub>t</sub> <sup>sm</sup>											
State	quad	Lag Lgt	alpha1	alpha2	alpha3	beta1	beta2	beta3	computed F	p value for F test	Sursmt granger causes dg?
CT	3	1	0.4323 (0.181)			-0.004593 (0.018)			0.0296591	0.970808	no
ME	3	1	0.0374 (0.189)			-0.0136 (0.019)			0.2324824	0.7941338	no
NH	3	1	0.1985 (0.184)			0.000838 (0.019)			0.000868	0.9991324	no
NJ	3	1	0.2188 (0.209)			-0.00806 (0.019)			0.0828567	0.920716	no
NM	3	1	-0.0388 (0.180)			-0.004746 (0.013)			0.0632185	0.9388769	no
WY	3	1	0.1296 (0.184)			0.0321 (0.048)			0.2072325	0.8141115	no

<b>Table 3 - Granger Causality Test (continued)</b>											
Results for dg as a function of lagged dg and lagged sur <sub>t</sub> <sup>sm</sup>											
State	quad	Lag Lgt	alpha1	alpha2	alpha3	beta1	beta2	beta3	computed F	p value for F test	Sursmt granger causes dg?
AK	4	1	0.0658 (0.183)			0.004521 (0.005)			0.3616469	0.6995811	no
AZ	4	1	0.0915 (0.186)			0.003733 (0.022)			0.0135517	0.9865464	no
CA	4	1	-0.3959 (0.186)			0.000217 (0.048)			0.0000009	0.999999	no
CO	4	1	0.1134 (0.186)			0.001978 (0.008)			0.026928	0.9734574	no
FL	4	1	0.1276 (0.187)			-0.0134 (0.015)			0.3931402	0.678735	no
GA	4	1	-1.3993 (0.400)			-0.36 (0.316)			0.6027627	0.554497	no
HI	4	1	0.286 (0.181)			-0.004669 (0.019)			0.0286802	0.9717568	no
KY	4	2	-0.6574 (0.485)	-0.231 (0.192)		-0.6532 (0.403)	0.6323 (0.402)		2.0640903	0.1472332	no

Table 3 - Granger Causality Test (continued)											
Results for dg as a function of lagged dg and lagged sur <sub>t</sub> <sup>sm</sup>											
State	quad	Lag Lgt	alpha1	alpha2	alpha3	beta1	beta2	beta3	computed F	p value for F test	Sursmt granger causes dg?
MN	4	1	-0.4689 (0.169)			0.0188 (0.076)			0.0286551	0.9717811	no
NC	4	2	-1.211 (1.455)	-0.4102 (0.181)		-1.5033 (1.361)	1.4881 (1.360)		1.372141	0.2713217	no
OR	4	2	-0.8903 (0.385)	-0.1296 (0.182)		-0.6418 (0.254)	0.6275 (0.252)		3.29136	0.0538432	yes
TX	4	1	0.3174 (0.184)			-0.0072 (0.014)			0.1316035	0.8772474	no
VT	4	1	0.1716 (0.187)			-0.001621 (0.016)			0.0047604	0.9952517	no
VA	4	1	0.1085 (0.187)			-0.0107 (0.014)			0.276144	0.7608206	no

Table 4- VAR Parameter Estimates and Wald Test Results												
State	quad	Results for sur <sub>t</sub> <sup>sm</sup>						Results for sur*		Wald	Significance	tax smoo thing? (fail to reject null?)
		alpha1	alpha2	alpha3	beta1	beta2	beta3	lambda1	lambda2			
AL	1	1.4419 (0.697)	0.4252 (0.176)		2.2047 (0.614)	-1.1886 (0.614)		-0.8451 (7.408)	-0.1621 (0.439)	7.2	0.0273	No
OH	1	1.4719 (0.717)	-0.0299 (0.232)		2.4077 (0.627)	-1.3847 (0.626)		4.8545 (7.148)	0.6945 (0.438)	1.57	0.4562	Yes
OK	1	0.9723 (0.757)	0.4647 (0.255)	-0.6154 (0.264)	1.5388 (0.586)	-0.5191 (0.585)	-0.512 (0.599)	-4.84 (5.255)	-0.3054 (0.406)	10.51	0.0052	No
OR	4	0.9119 (0.608)	0.4074 (0.287)		1.5826 (0.401)	-0.5652 (0.399)		1015 (1506.0)	146.3328 (121.781)	1.62	0.4446	Yes

The quadrants are divided based on the average growth rate (0.037) and the average standard deviation (0.052).

## APPENDIX

This follows closely the presentation of Ghosh (1995) and Olekalns (1997).  
The government's objective function at time t is

$$V = -(1/2) \sum_{i=0}^{\infty} \beta^i E[\tau_{t+i}^2 | I_t] \quad 0 < \beta < 1 \quad (1)$$

where  $\beta$  is the rate at which the government discounts the future, E is the expectations operator,  $I_t$  is the information available to the government at time t, and  $\tau$  is the average tax rate. The government faces the following budget constraint:

$$D_{t+1} = (1+r)D_t + G_t - \tau_t Y_t \quad (2)$$

where D is the stock of debt, r is the interest rate (which is assumed to be constant), G is exogenous government expenditure and Y is output.

Given perfect foresight and forbidding a Ponzi-type game, iterating equation (2) forward produces

$$\sum_{i=0}^{\infty} \rho^i G_{t+i} = \sum_{i=0}^{\infty} \rho^i \tau_{t+i} Y_{t+i} - (1+r)D_t \quad (3)$$

where  $\rho = 1/(1+r)$ . Normalizing each of the terms in equation (3) by  $Y_t$  produces

$$\sum_{i=0}^{\infty} g_{t+i} \rho^i (1+n_j)^i = \sum_{i=0}^{\infty} \tau_{t+i} \rho^i (1+n)^i - (1+r)d_t \quad (4)$$

where lower-case letters correspond to their upper-case letter after normalization. Additionally, n is real output's growth rate.

Normalizing the government's budget constraint (equation 2) delivers

$$(1+n)d_{t+1} = (1+r)d_t + g_t - \tau_t \quad (5)$$

Maximizing the objective function (1) with respect to (4) and (5) produces an optimal tax rate:

$$\tau_t^* = \gamma_t \left\{ (1-R) \sum_{i=0}^{\infty} R^i E[g_{t+i} | I_t] + (r-n)d_t \right\} \quad (6)$$

where  $R = \rho(1+n)$  and  $\Upsilon = [(1-(R/\beta)R/1-R)]$  for each state. An assumption in equation (7) is that  $\Upsilon=1$  or that the real interest cost (R) equals each governments' discount rate ( $\beta$ ). Allowing these rates to differ creates a "tax tilting" situation where a government might have a bias for running a deficit.

A further implication of an I(1) tax rate is that changes in  $\tau^*$  (the optimal tax rate) will vary only in response to new information, or

$$\Delta\tau_t^* = (1-R) \sum_{i=0}^{\infty} R^i [E(g_{t+i} | I_t) - E(g_{t+i} | I_{t-1})] \quad (7)$$

where  $g$  represents any new information regarding government spending changes. Since these changes are not predictable, neither are changes in  $\tau$ .

The implications to be tested in the paper follow from the above equations. First, equation (6), the dynamic budget constraint can be rewritten as:

$$(1+n)(d_t - d_{t+1}) = \tau_t - g_t + (n-r)d_t \quad (8)$$

which says that the current budget surplus,  $(1+n)(d_t - d_{t+1})$ , depends on expected changes in  $g$ .

Assuming, at this point, that  $\Upsilon = 1$ , equation (6) can be rewritten as

$$sur_t^* = (1-R) \sum_{i=0}^{\infty} R^i E(g_{t+i} | I_t) - g_t \quad (9)$$

or

$$sur_t^* = \sum_{i=1}^{\infty} R^i E(\Delta g_{t+i} | I_t)$$

As noted above, the preceding work relies on the condition that  $\Upsilon=1$  (i.e.  $\beta=R$ ) or that the governments have no incentive to favor a budget surplus over a budget deficit. In reality, governments do have preferences for running surpluses or deficits that are unassociated with tax smoothing. This action is called "tax tilting." Using equation (9), the tax tilting effects are eliminated by letting  $R$  differ from  $\beta$  (for each state) and estimate  $\Upsilon$ :

$$sur_t^{sm} = \Upsilon^{-1} \tau_t - g_t - (r-n)d_t \quad (10)$$

where  $sur^{sm}$  is the surplus with the tax tilting effects removed. Using equation (10), we estimated  $\Upsilon^1$  (the tax tilting parameter) for each state.

Using the path of the optimal budget surplus delivered in equation (9), further implications of the TSH are tested using a VAR. Under the null hypothesis, the surplus contains all of the known information on future changes in government expenditures. These forecasts are generated using a bivariate VAR in  $\Delta g_t$  and  $sur_t^{sm}$ . The VAR can be expressed as

$$v_t = A_1 v_{t-1} + A_2 v_{t-2} + \dots + A_q v_{t-q} + e_t \quad (11)$$

where  $v_t$  is the 2x1 vector of variables  $(\Delta g_t, sur_t^{sm})'$ ,  $e_t$  is a 2x1 vector of residuals, and each coefficient matrix  $A_q$  is 2x2. In first order form, the VAR is written as

$$\begin{bmatrix} v_t \\ v_{t-1} \\ \cdot \\ \cdot \\ v_{t-q+1} \end{bmatrix} = \begin{bmatrix} A_1 A_2 \dots A_q \\ I_2 0_2 \dots 0_2 \\ 0_2 I_2 0_2 \dots 0_2 \\ \cdot \\ 0_2 \dots I_2 0_2 \end{bmatrix} \begin{bmatrix} v_{t-1} \\ v_{t-2} \\ \cdot \\ \cdot \\ v_{t-q} \end{bmatrix} + \begin{bmatrix} I_2 \\ 0_2 \\ \cdot \\ \cdot \\ 0_2 \end{bmatrix} e_t. \quad (12)$$

where  $I_2$  is a 2x2 identity matrix and  $0_2$  is a 2x2 matrix of zeroes. Written in compact form, the system is written as

$$Q_t = A Q_{t-1} + W e_t \quad (13)$$

Where  $Q_t = (v_t \ v_{t-1} \ \dots \ v_{t-q} + 1)'$  and  $W = (I_2 \ 0_2 \ 0_2 \ \dots \ 0_2)'$ .

Because expected values of the shocks to the VAR are zero, forecasts of the variables  $i$  steps ahead are

$$E(Q_{t+i}|I_t) = A^i Q_t. \quad (14)$$

The expected changes in government expenditures can be recovered from

$$E(\Delta g_{t+1}|I_t) = A^i z' Q_t, \quad (15)$$

where the vector of  $z'$  is of length  $2q$  and is defined by  $z' = (1 \ 0 \ 0 \ \dots \ 0)$ .

Equations (9) and (15) imply

$$sur_t^{*sm} = \sum R^i A^i z' Q_t \quad (16)$$

where  $sur_t^{*sm}$  is the surplus given optimal tax smoothing. As long as the variables in the VAR system are stationary, which requires that the infinite sum in equation (9) converges, then the infinite sum in equation (16) will converge to

$$sur_t^{*sm} = z' R A [I - R A]^{-1} Q_t, \quad (17)$$

where  $I$  is an identity matrix.

The values for the optimal budget surplus ( $sur_t^{*sm}$ ) derived from equation (17) can be compared to the actual tax smoothing budget surplus ( $sur_t^{sm}$ ) in the formal test

$$sur_t^{*sm} = \Lambda Q_t = \lambda_1 \Delta_1 g_t = \lambda_2 sur_t^{sm}. \quad (18)$$

The null hypothesis (government expenditures do not help predict changes in the surplus) implies the joint parameter restriction  $\lambda_1 = 0$  and  $\lambda_2 = 1$ . The non-rejection of the null suggests that the government follows tax-smoothing behavior.



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# THE DETERMINANTS OF CORPORATE DIVIDEND POLICY

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## ABSTRACT

*What factors determine a corporation's dividend policy? This study empirically examined the data for a sample of 483 firms taken from the Multex Investor Database to assess the impact of selected financial variables on the dividend decision using OLS Regression. Results of this study suggest that the higher the firm's PE, the lower its risk, and the higher the payout ratio. The greater the degree of insider ownership the lower is the dividend payout. These findings suggest that management in the firms examined have an incentive to reduce dividends in order to increase the expected value of their stock options received as executive compensation. The firms in the sample also seek to insure access to equity capital to fund growth by establishing a good reputation with stockholders through higher dividends. The importance of dividend cash flow as a signaling device to stockholders is also evident in the sample since even with high growth, the firm is willing to increase debt to fund increasing dividends. The firms in the sample desire to "put their money where their mouth is" by sending a strong positive signal to institutional owners to enhance reputation and maintain access to capital.*

## INTRODUCTION

Dividend policy is one of the most controversial subjects in finance. Finance scholars have engaged in extensive research to explain why companies should pay or not pay dividends. Many researchers (Baker & Powell, 1999) have developed and empirically tested various models to explain dividend behavior. Some researchers (Baker, Veit & Powell, 2001) have surveyed corporate managers and institutional investors to determine their views about dividends. Despite extensive debate, the actual motivation for paying dividends remains a puzzle (Baker & Powell, 1999).

A better understanding of the motivation for the dividend decision could shed significant light on stock valuation, since dividends play a central role in traditional stock valuation models. In such models, stocks have value because they hold the promise of future cash payouts. Dividends constitute the primary cash payment to stockholders or the greater the expected future stream of dividends, the greater the value of the stockholder's share (Carlson, 2001).

Some researchers believe that dividends increase shareholder wealth (Gordon, 1959), others believe that dividends are irrelevant (Miller & Scholes, 1978), and still others believe that dividends decrease shareholder wealth (Litzenberger & Ramaswamy, 1979). More recent research (Cornell & Shapiro, 1987; Peterson & Benesh, 1983; Prezas, 1988; Ravid, 1988) suggests that there are interactions between investment and financing decisions. Cornell and Shapiro (1987) suggest that non-investor stakeholders (customers, employees, suppliers, distributors, and other firms providing complementary goods and services) influence this interaction of investment and financing decisions.

The purpose of this study is to investigate the factors that motivate the dividend decision. Payout ratio is the dependent variable in the regression. The independent variables selected from the literature include: price to earnings ratio, profit margin, debt to equity ratio, current ratio, float, insider ownership, institutional ownership, and the estimated five-year growth rates for earnings per share and sales growth. Analysis of these variables should shed some light on how a firm determines the amount of dividends to pay stockholders.

### **LITERATURE REVIEW**

Lintner (1956) hypothesized that dividends are based primarily on net income levels and are adjusted slowly in response to income changes. Lintner provides evidence that a rise in individual tax rates encourages stockholders to prefer corporate savings over a dividend payment as a tax shelter since retained earnings are not taxed immediately as dividends are. The shareholder only pays capital gains taxes at the time of the sale of the stock. In addition, Malkiel (1999, p. 329) supports the Lintner finding with respect to the 1997 long-term capital gains tax reduction to a maximum rate of 20%, while the maximum tax rate on dividends is 39.6%.

Baker and Powell (1999) conducted a survey on dividend policy. Most respondents think dividend policy affects firm value. Respondents had the highest level of agreement with statements involving dividend signaling. This idea has merit since a share of common stock is worth the "present" or "discounted" value of its stream of future dividends (Malkiel, 1999, p. 327). Cash dividends announcements convey valuable information about management's assessment of a firm's future profitability. The survey results suggest that investors may use dividend announcements as information to assess a firm's stock price. For example, steep drops in stock prices often accompany dividend cuts signaled as bad news about the future prospects of the firm. Respondents were most uncertain about statements involving the tax-preference and the bird-in-hand explanations of dividend relevance. The bird in hand theory claims a high dividend yield will maximize a firm's value. Dividends represent a sure thing relative to share price appreciation because dividends are less risky than capital gains. The study respondents also suggested that managers are highly concerned about the continuity of dividends. Dividend continuity suggests stability and constant growth in the firm's earnings. This increases investor confidence by insuring a constant of return on investments.

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Hexter, Langrehr, and Holder (1998) concluded that corporate focus is negatively related to dividend payout ratios. The authors define a corporation as being focused when the firm's sales are attributable to a distinct business line. The more focused firms tended to have lower dividend payout ratios. Larger firms tended to have higher payout ratios than smaller firms. The greater the degree of insider ownership, the lower the payout. The study found that the larger the number of shareholders, the higher the dividend-payout, and the greater the free cash flow, the higher the payout ratio.

Lazo's survey (1999) revealed that 87% of dividend paying companies believe that dividends do signal information regarding future earnings of the company. 110 senior financial officers from S&P 500 companies responded to the survey, representing a response rate of 22%. Results show that of corporations having a buyback program in place in the last two years, 72% increased their dividend payout. 25% used cash flow to fund repurchase programs, rather than to increase dividend payments. 93% of the responding officers felt that, "initiating a stock-buyback program is believed to be more effective than raising dividends in providing downside stock-price protection in a falling market." 79% of respondents stated that, "stock repurchase programs do not receive a higher priority use of corporate cash flow than dividends, even if corporate profitability were to come under pressure."

Carlson (2001) discusses the factors that affect the dividend decision. He concludes that stock repurchases explain a small part of the decline in dividend yield. He suggests that the decline might also reflect a continuation of the postwar trend in dividend policy, that is to increase retained earnings and invest productively. In the postwar period, lower dividend yields have been more than offset by higher earnings growth and hence higher stock price appreciation. A third reason for declining dividend yield could be related to the swift acceleration of stock prices. In essence, if stock prices appreciate faster than dividends, dividend yields must decline.

Kumar and Lee (2001) examined the determinants of dividend smoothing. Dividend smoothing is the method of maneuvering the time profile of earnings or earnings reports to make the reported income stream less variable. They found that by making the stream of dividend payments constant, shareholders are not disappointed or upset by changes in dividend payout. By testing earnings variance, financial distress or bankruptcy risk, and return on firm capital investment they report a significant connection between dividend smoothing and dividend policy. The empirical model is consistent with the constancy of dividends over time.

### **JUSTIFICATION OF VARIABLES**

LaPorta, Silanes, Schliefer, and Vishny (2000) claim that shareholders will vote for directors who offer high dividends, in other words, the shareholders extract the dividends. To study this effect, we use float as an independent variable to measure outside control by shareholders. Float is

the number of shares outstanding and being traded in the public. Thus we hypothesize that the higher the float the greater the outside control and the higher the dividend payout ratio.

Increases in the use of incentive based compensation instruments, such as stock options, have implications for the payout ratio of the firm according to Banarjee, Gatchev, and Spindt (2002). Dividends tend to reduce the value of options, so management might have a conflict of interest when deciding whether or not to pay a cash dividend. Lambert, Lanen, and Larcker (1989) try to explain this phenomenon by reasoning that dividend payout will result in a decrease in stock price. Since executive stock option plans are not generally protected and there is a very high probability that the option will finish "in the money", the payment of dividends will result in a decrease in the value of the executive's stock options. This suggests that management has an incentive to reduce dividends in order to increase the expected stock value of their options. Therefore, the initial adoption of an executive stock option plan should motivate managers to decrease the level of corporate dividends relative to the level of dividends in the absence of the stock option plan. Insider ownership is the percentage of shares that are owned by all officers and directors of the company as well as any stockholders that hold more than 5% of the company's stock. We hypothesize that the higher the insider ownership the lower the dividend payout ratio.

Firms with lower share turnover are more likely to pay a dividend (Banerjee, Gatchev & Spindt, 2002). We use the amount of institutional ownership to measure turnover. Institutional owners are much less likely to trade stock as often as individual owners. Institutional ownership is the percent of stock held by all reporting institutions as a group. We expect to observe positive relationship between institutional ownership and the dividend payout ratio.

High growth firms have greater need for external financing. Therefore, to insure access to external equity capital the firm may be motivated to establish a good reputation with stockholders through higher dividend payout (LaPorta, Silanes, Schliefer & Vishny, 2000). We measure growth with the estimated five-year sales growth rate. We expect sales growth to relate positively with dividend payout.

High dividend payout should be associated with high stock price and therefore, high PE. In essence, raising dividends reduces the risk of future cash flows to the stockholder which increases stock price and the PE ratio. According to Friend and Puckett (1964), the dividend effect suggests that a dollar of dividends has four times the average impact on stock price than a dollar of retained earnings. High PE's may be associated with low risk and higher payout ratios, whereas low PE's may be attributed to high risk and lower payout ratios. The price to earnings ratio is calculated by dividing the current market price of the stock by the estimated earnings per share for the current fiscal year. We hypothesize a positive relationship between PE and dividend payout.

DeAngelo, DeAngelo, and Skinner (1992) found evidence that current income is a critical determinant in dividend decisions. As such, managers are reluctant to reduce dividends except during periods when earnings are especially poor. This implication suggests that an earnings loss is a necessary condition to prompt a dividend reductions by firms with established earnings and

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dividend records. Likewise, it is reasonable to expect that not all firms with losses reduce dividends. Only those firms with deep and persistent earnings problems will cut dividends. We measure current earnings with earnings per share growth for the last five years and expect a positive relationship with dividend payout.

According to Darling (1957) and Baker, Veit, and Powell (2001), firms with higher levels of debt also need higher levels of liquidity to allow for payoffs on potential implicit claims. These firms are more conservatively financed, use more equity, and maintain a higher level of liquidity to avoid the costs of financial distress. To increase liquidity, firms might lower dividend payouts. Lower payouts mean firms will need less outside financing, since they are retaining cash internally to strengthen liquidity. Thus, we expect a negative relationship between liquidity and dividend payout since the more cash paid out to investors in the form of dividends would reduce the cash on hand to the firm.

Firms with larger profits are more likely to pay a dividend (Banerjee, Gatchev & Spindt, 2002). According to Lintner (1956) corporations are conservative in their financial policy, and consequently their dividend disbursement activity is characterized by a considerable degree of inertia, more precisely, there exists some optimal or target dividend payment per share to which corporations adhere. Departures from this level are made reluctantly, following a change in the level of profits, which is deemed to be more or less permanent. Companies that are facing uncertainty about future profits would adopt a lower payout ratio as a means of hedging the risk of having to cut their dividend in the future (Friend & Puckett, 1964). Corporate aggregate dividend policy will tend to vary directly with current profits, past profits, the rate of amortization recoveries, and shifts in anticipation of future earnings and will vary inversely with persistent changes with the level of sales (Darling, 1957). We measure profitability with the profit margin and expect the ratio to relate positively with dividend payout.

Companies with high levels of cash flow are less likely to cut their dividend, while high levels of leverage increase the probability of a dividend cut. Rather than adjusting payouts to maintain investment plans such companies must instead borrow more or raise more equity financing (Benito & Young, 2001). High rates of retention are associated with relatively heavy external financing and low rates of retention with small amounts of external financing. The inherent advantages of retaining earnings undoubtedly encourage the maximum use of this source of funds before resorting to the capital markets. Thus, external financing may be associated with high earnings retention for companies with abundant investment opportunities, whereas the absence of external financing may be associated with lower earnings retention for other companies. The rate of earnings retention is positively correlated with external financing (Friend & Puckett, 1964). Therefore, the higher the earnings retention rate, the lower the dividend payout ratio. We expect the level of external financing as measured by the debt to equity ratio to vary inversely with dividend payout. Table 1 provides definitions of the variables presented in the literature and the hypothesized relationships with dividend payout.

<b>Table 1: Variable Definitions and Hypotheses</b>			
Var. Name in Study	Variable Name in Database	Variable Description	Hypothesized Relationship with Dividend Payout
PO	Payout Ratio, TTM (%)	Percentage of the primary/basic earnings per share excluding extraordinary items paid to common stockholders in the form of cash dividends during the trailing twelve months.	Not Applicable
PE	Current Fiscal Year Projected P/E Ratio (\$)	Current fiscal year projected price to earnings (P/E) ratios given to companies by analysts calculated by dividing current by the mean EPS estimate for the current fiscal year.	Positive
5 yr sales growth	Sales, 5 Year Growth Rate (%)	Compound annual growth rate of sales per share over the last 5 years.	Positive
5 yr EPS Growth	Earnings Per Share, 5Year Growth Rate (%)	Compound annual growth rate of earnings per share excluding extraordinary items and discontinued operations over the last 5 years.	Positive
Current Ratio	Current Ratio, Quarterly	This is the ratio of total current assets for the most recent quarter divided by total current liabilities for the same period.	Negative
DE	Total Debt To Total Equity, Quarterly	Total debt for the most recent fiscal quarter divided by total shareholder equity for the same period.	Negative
Float	Float (millions)	The number of freely traded shares in the hands of the public calculated as shares outstanding minus shares owned by insiders, 5% owners, and Rule 144 Shares.	Positive
Insider	Insider Ownership Percent (%)	Percent of common stock held by all the officers and directors of the company plus beneficial owners who own more than 5 percent of the company's stock.	Negative
Institutional	Institutional Percent Owned, (%)	This is the percent of common stock held by all the reporting institutions as a group. It is total shares owned by institutions divided by total shares outstanding multiplied by 100.	Positive
PM	Net Profit Margin, TTM (%)	Return on sales, this value is the income after taxes for the trailing twelve months divided by total revenue for the same period and is expressed as a percentage.	Positive

### SAMPLE SELECTION AND CHARACTERISTICS

To study the determinants of dividend decision policies, we tested the selected variables' effects on the dividend decision for a large sample of publically traded firms. We created the sample

of firms using the power-screening tool from MultexInvestor.com. MultexInvestor.com is the website of Market Guide, Inc., which provides quarterly, fundamental financial information on over 10,000 publicly traded companies that trade on the NASDAQ, AMEX, NYSE, and OTC exchanges (www.MultexInvestor.com). We observed the data for all firms in the selected sample at the end of the second quarter of 2003.

The query of Multex Investor produced a sample of 483 companies. Firms were screened by each variable with values greater than zero for the selected firm. For example, all publicly traded firms in the Multex Investor database with the variables used in this study that had ratios greater than zero are included in the sample of 483 companies. Table 2 outlines the characteristics of the companies used in the study. Of the firms reported, 385 (or 80%) are traded on the NYSE, 92 (or 19%) are traded on the NASDAQ, and the remaining 6 (or 1%) trade on the AMEX. Thus, the sample consists of mostly large, national, and global firms traded on the NYSE.

Variable Description	Factor	Mean
Payout Ratio (%)	Dividend Decision	39.63
Current Fiscal Year Projected PE Ratio	PE	18.04
5 Year Sales Growth (%)	Growth	12.34
5 Year EPS Growth (%)	Earnings Strength	16.82
Current Ratio	Liquidity	1.68
Total Debt to Total Equity Ratio	Financial Leverage	1.28
Float or Total Shares Owned by Non-Insiders	Outsider Influence	262.56 Million Shares
Insider Ownership (%)	Insider Influence	17.91
Institutional Ownership (%)	Share Turnover	51.57
Net Profit Margin (%)	Profitability	9.00
Trailing Twelve Month Sales Revenue	Size	9.3 Billion Dollars
Total Assets as of June 30, 2003	Size	10.5 Billion Dollars
Market Capitalization	Size	11.5 Billion Dollars

## METHODOLOGY

To analyze those characteristics of a company that appear to affect the dividend decision, this study employs Ordinary Least Squares (OLS) Regression on the sample of 483 firms from the Multex Investor Database. We empirically test the impact of independent variables (defined in Table 1) on the firm's dividend payout ratio (the dependent variable and proxy for the dividend decision). The relationship is represented by:

$$\text{Dividend Decision} = f(\text{PE, Growth, Earnings Strength, Liquidity, Financial Leverage, Outsider Influence, Insider Influence, Share Turnover, and Profitability})$$

The regression included the sample of 483 companies screened from the Multex Investor Database with sufficient data to be used in this study. The data were observed as of the end of the second quarter of 2003. Table 1 defines the variables observed in the database.

A common problem with multiple regression analysis arises when the potential for collinearity among the selected independent variables or multicollinearity exists. To check for the presence of multicollinearity, we follow the process offered by Canavos (1984) that is, to increase the observation points to 483 and to test for collinearity among independent variables with a correlation matrix shown in Table 4. According to Mason and Lind (1996, p. 541), "A common rule of thumb is that correlations among independent variables from  $-.70$  to  $.70$  do not cause problems." As shown in Table 3 none of the selected independent variables were shown to be highly correlated since all were within the  $-0.70$  to  $0.70$  guidelines. Therefore, we control for the problem of multicollinearity.

	<i>PE</i>	<i>5 yr sales growth</i>	<i>5 yr EPS Growth</i>	<i>Current Ratio</i>	<i>DE</i>	<i>Float</i>	<i>Insider</i>	<i>Institutional</i>	<i>PM</i>
<i>PE</i>	1.0000								
<i>5 yr sales growth</i>	-0.0176	1.0000							
<i>5 yr EPS Growth</i>	0.0356	0.3750	1.0000						
<i>Current Ratio</i>	0.0724	-0.0083	-0.0131	1.0000					
<i>DE</i>	-0.0452	-0.0008	-0.0368	-0.0873	1.0000				
<i>Float</i>	0.0582	-0.0217	-0.0401	-0.0887	-0.0365	1.0000			
<i>Insider</i>	-0.0737	0.2029	0.1499	0.0520	0.0589	-0.1759	1.0000		
<i>Institutional</i>	0.0865	-0.1611	-0.1409	-0.0370	-0.0738	-0.0726	-0.4479	1.0000	
<i>PM</i>	-0.0591	0.2043	0.1728	0.0549	-0.0483	0.1086	0.1604	-0.1756	1

### QUANTITATIVE TESTS AND RESULTS

The regression results are shown in Table 4. The adjusted  $R^2$  was 20.53% for the regression model. These variables tested explain 20.53% of the factors that determine the dividend payout for the firms analyzed. The price to earnings ratio is related positively to the payout ratio at the 1% level of significance. As observed, high dividend payout is associated with high stock price and high PE. Raising dividends reduces the risk of future cash flows to the stockholder which increases stock price and the PE ratio. As suggested in the literature and observed here, high PE's appear to associate with low risk and higher payout ratios, whereas low PE's translate to high risk and lower payout ratios.

N = 483	Variable	Hypothesized Sign	Actual Coefficient.	T-Stat.	P Value
Dependent Variable	Dividend Payout Ratio	Not Applicable	33.933	4.594	0.0000**
Independent Variables	PE Ratio	Positive	+1.642	+7.797	0.0000**
	5 Year Sales Growth	Positive	+0.516	+2.992	0.0029**
	5 Year EPS Growth	Positive	+0.067	+0.744	0.4575
	Current Ratio	Negative	-1.396	-1.392	0.1645
	DE or Debt to Equity Ratio	Negative	+1.730	+2.048	0.0411*
	Float	Positive	-0.003	-0.915	0.3607
	Insider Ownership	Negative	-0.340	-3.338	0.0009**
	Institutional Ownership	Positive	-0.551	-7.367	0.0000**
	Profit Margin	Positive	+0.013	+0.052	0.9586
** Significant at the 1% level					
* Significant at the 5% level					

As expected, estimated five-year sales growth related positively to the payout ratio at the 1% level of significance. High growth firms have greater need for external financing. Therefore, to insure access to external equity capital apparently the firms in this study are motivated to establish a good reputation with stockholders through higher dividend payout (LaPorta, Silanes, Schliefer & Vishny, 2000).

Contrary to the literature, financial leverage or the DE ratio is positively correlated with dividend payout at the 1% level of significance. Apparently, the firms observed, which are mostly large reputable corporations traded on the NYSE, are embracing high dividend payout to insure a strong financial reputation that would allow easy access to external capital to fund growth opportunities (LaPorta, Silanes, Schliefer & Vishny, 2000). Since we also observe a significant positive relationship between growth and dividend payout, the motivation to sustain high payout to insure reputation and access to capital even at the expense of higher levels of debt appears plausible. Apparently, the firms in the study place the importance of strong dividend payout over concerns over growth or financial leverage. Even with high growth and debt, the dividend comes first. In the face of traditional theory (see section on justification of variable), this finding offers strong support for the value firms place on dividend signaling.

As predicted, insider influence on the dividend decision as measured by the insider ownership variable moves inversely with dividend payout and is significant at the 1% level of significance for the firms studied. Dividends tend to reduce the value of options, so insider managers holding incentive compensation packages including stock options might have a conflict of interest when deciding whether or not to pay a cash dividend. In agreement with Lambert, Larcker, and Larcker (1989) this suggests that management in the firms examined have an incentive to reduce dividends in order to increase the expected stock value of their options since the greater the insider ownership, the lower the dividend.

Contrary to the literature, share turnover as measured by institutional ownership was positively related to dividend payout at the 1% level of significance. According to Banerjee, Gatchev, and Spindt (2002) firms with lower share turnover are more likely to pay a dividend. We observe the exact opposite. Possibly institutional ownership is not an accurate proxy of share turnover for the sample studied since most of these NYSE firms are heavily traded by both individuals and institutions thereby explaining the anomalous results. Another explanation is that firms in the sample desire to "put their money where their mouth is" by sending a strong positive dividend signal to institutional owners to enhance reputation and maintain access to capital.

In support of the literature (Banerjee, Gatchev & Spindt, 2002; Friend & Puckett, 1964; Lintner, 1956; Darling, 1957; DeAngelo, DeAngelo & Skinner 1992), earnings strength and profitability relate positively with the dividend payout ratio but are insignificant in explaining the dividend behavior of the firms studied. Firms with larger profits are more likely to pay a dividend. Companies that are facing uncertainty about future profits would adopt a lower payout ratio as a means of hedging the risk of having to cut their dividend in the future. As such, managers are reluctant to reduce dividends except during periods when earnings are especially poor. While this study's finding of a positive relationship between profit margin and dividend payout agrees with common finance logic, the strength of the relationship proved insignificant.

As predicted, findings show a negative but insignificant relationship between the current ratio and the dividend payout for the firms tested. Contrary to the hypothesis, float was negative, but proved to be insignificant.

## CONCLUSION

This study empirically examined the data for a sample of 483 firms taken from the Multex Investor Database to assess the impact of selected financial variables on the dividend decision using OLS Regression. The study used the firm's dividend payout ratio as the dependent variable to represent the dividend decision. Independent variables tested include: price to earnings ratio, profit margin, the debt to equity ratio, the current ratio, percent of insider ownership, percent of institutional ownership, float, and the estimated five-year growth rates for earnings per share and sales. As expected, the PE and sales growth related positively to the dividend payout ratio.

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Likewise, insider ownership produced the anticipated negative relationship with dividend payout. Contrary to the literature, institutional ownership varied positively with dividend payout. The positive relationship observed between the debt to equity ratio and the dividend payout ratio produced anomalous results.

Results of this study suggest that the higher the firm's PE, the lower its risk, and the higher is its payout ratio. Since the greater the insider ownership the lower the dividend, the findings suggest that management in the firms examined have an incentive to reduce dividends in order to increase the expected value of their stock options received as executive compensation. The firms in the sample also seek to insure access to equity capital to fund growth by establishing a good reputation with stockholders through higher dividends. The importance of dividend cash flow as a signaling device to stockholders is also evident in the sample since even with high growth, the firm is willing to increase debt to fund increasing dividends. The firms in the sample desire to "put their money where their mouth is" by sending a strong positive signal to institutional owners to enhance reputation and maintain access to capital.

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# NOMINAL TREASURY SECURITIES AND TREASURY INFLATION-INDEXED SECURITIES: AN EXAMINATION OF THEIR YIELD SPREAD

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## ABSTRACT

*The Treasury department began to offer Treasury securities with returns protected against inflation in January 1997. Inflation was not the main concern for investors back then. Today, the popularity of Treasury Inflation-Indexed Securities (TIIS) is on the rise due to the increased demand for fixed-income securities by investors, the increased supply of TIIS, and the increased possibility of higher fluctuation of price levels. This study analyzes the yields of nominal Treasury securities and TIIS, to determine whether or not the preference for real returns by investors more than compensate for the lack of liquidity of TIIS. To this effect, daily price and yield information (Wall Street Journal) on the five-year conventional Treasury note (maturing July 2002) and the five-year TIIS (maturing July 2002) was gathered from July 1997 to December 2001. The evidence presented in this study indicates that investment in TIIS provides portfolio diversification benefits, and the yield spread between conventional Treasury Notes and TIIS, despite its constant fluctuation, has been lower than the proxy for the annual inflation rate. The first section contains the introduction. The second section describes the methodology used in this study and the results. The last section presents the summary and conclusions.*

## INTRODUCTION

The Treasury department began offering inflation-indexed securities in January of 1997. At that time, 5-year, 10-year, and 30-year TIIS were issued. In 2000, the Treasury announced that only 10-year and 30-year TIIS would be issued. TIIS are similar to nominal Treasury bonds, except that the value of the principal (and interest payments) is adjusted for inflation (using the consumer price index-urban). However, the yield on TIIS is a real yield that is supposed to measure a real interest rate. According to the Fisher effect, a nominal interest rate is equal to a real interest rate plus the expected rate of inflation (ex ante). If we assume that the yield on a conventional Treasury security measures a nominal interest rate, and the yield on a TIIS security measures a real interest rate, then the yield spread (conventional Treasury yield minus the TIIS yield) should serve as a proxy for the expected inflation rate.

From an investor's point of view, the possibility of investing in securities providing a real interest rate seems valuable: investment value is protected from erosion due to inflation and because of diversification purposes (low correlation between TIIS and nominal securities). From the government's point of view, TIIS are attractive because they can pay public debt with real rates rather than nominal rates that might have a higher measure of inflation.

Several studies have examined the yields of conventional and inflation-indexed Treasury securities. Emmons (2000) and Shelton (2000) have pointed out that TIIS yields, due to marketability and liquidity issues, might not reflect a "true" real interest rate. Shen and Corning (2001), examining the behavior of the 10-year TIIS and the 10-year conventional T-bond for the period 1997-2001, arrived to similar conclusions. Shen and Corning used a ten-year average inflation rate, and in their analysis, the maturity of the conventional Treasury security not always matched the maturity of the inflation-indexed security. Lashgari (2000) examined the monthly yields of inflation-indexed bonds and nominal bonds and found that TIIS yields have "... provided a stable real return which is, at least, statistically equal, and in most cases superior, to the average real rate on nominal government bonds." Lashgari used the 10-year regular T-note and the 10-year TIIS, and analyzed their yields for the period 1998-1999. Sack (2000), while trying to construct a measure of inflation expectations, analyzed the yields of 10-year T-notes and yields on a portfolio of TIIS and Treasury STRIPS. Sack found that his derived measure of inflation compensation (a constant rate of inflation at which the value of the TIIS equals the value of a portfolio of Treasury STRIPS) has become more useful as a predictor of future inflation for the 1997 - 2000 time period.

This study takes a different approach. First, instruments with a different maturity have been selected. The five-year conventional Treasury note and the five-year TIIS are used because of their similar maturity date, July 2002. None of the previous studies have examined the daily yields of 5-year Treasury notes (conventional and TIIS) for their entire maturity. The analysis of similar securities for their entire maturity should mitigate the importance of the liquidity bias, or at least keep it constant. The first hypothesis to be tested in this study is:

*The yield spread, yield on a conventional Treasury note minus the yield on TIIS, is a useful proxy for the rate of inflation.*

There is also the possibility that as the 5-year TIIS approaches its final maturity, financial participants might consider it a good investment. Furthermore, the five-year Treasury note is considered one of the safest instruments by investors. Whenever there is a flight to quality, investors choose the five-year note rather than the ten-year note or the thirty-year bond. As the economy deteriorated in the later part of 2000, and after the events of September 11, investors might show a higher preference for TIIS. Brown Brothers Harriman (BBH), in its Global Financial Markets Outlook (2001), describes that "a flight to equity has benefited U.S. Treasuries and penalized investors in credit-sensitive securities". BBH also explains that the corporate spread

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(investment-grade corporate rate minus U.S. Treasuries rate) widened from about 40 basis points in 1997 to 140 basis points in 2001. Uncertainty and recession realities were possible explanations behind this pattern.

This analysis almost covers the full five-year maturity spectrum of the instruments (1997-2001), with the purpose of capturing long- and short-term proxies for real returns and inflation. The second hypothesis in this study is:

*The yield spread exhibits a constant behavior throughout the entire maturity of the 5-year notes.*

## METHODOLOGY AND RESULTS

Daily yields for the conventional 6 percent Treasury note maturing July 2002 and the 3 5/8 percent TIPS maturing July 2002 were gathered from *The Wall Street Journal*, from July 25, 1997 to December 31, 2001. Summary statistics about the daily yield spread (conventional yield - TIPS yield) and changes in daily yields are provided in Table 1. Among other things, the yield differential exhibits a wide fluctuation, from negative 0.51 percent to positive 3 percent, and this range seems to differ from the range of changes in expected inflation. The average yield spread for the entire period is 1.86%, which might be a very low estimate of expected inflation during this period of time. The volatility of daily yields as measured by the standard deviation, (either in level form or change form) is much wider for the conventional security than for the inflation-adjusted security. This is an interesting result as some other studies have mentioned that TIPS might exhibit uncertain volatility characteristics that might make them undesirable for portfolio diversification purposes (see Craig (2003)). Finally, the correlation coefficient between daily changes in conventional yields and TIPS yields is only 0.30, which is consistent with the relationship found by other studies (see for example Emmons (2000)). This low correlation coefficient along with low daily volatility, suggest that investors could benefit from TIPS whenever they seek to diversify their portfolios.

Tables 2-6 present the annual summary statistics for the years 1997-2001. The correlation coefficient between daily yield changes of nominal and TIPS securities was at first negative but later on fluctuated between 0.24 (1999) and 0.44 (1998). The means of daily yield changes (conventional and TIPS) are not significantly different from each other, except for 1999, as revealed by a test for the difference in means (t-test with unequal variances). The average (median) yield spread ranged from a low of 1.46 percent (1.66 percent) in 1998 to a high of 2.46 percent (2.47 percent) in 2000. The standard deviation of the yield spread showed the lowest point in 1997 (0.17) and reached a maximum in 2001 (0.84), which might be a reflection of the September 11 events.

	Conventional Yield	TIIS Yield	Conventional Yield Change	TIIS Yield Change	Yield Spread
Average	5.2265%	3.3652%	-0.00396%	-0.001%	1.8613%
Median	5.59	3.71	0	0	1.94
Standard Deviation	1.1596	0.8374	0.06226	0.0541	0.6308
Minimum	1.68	0.91	-0.65	-0.55	-0.509
Maximum	6.9	4.12	0.33	0.527	3.004
# of Observations	1089	1089	1088	1088	1089
Correlation coefficient	0.3011				

	Conventional Yield	TIIS Yield	Conventional Yield Change	TIIS Yield Change	Yield Spread	Yield Spread Change
Average	5.961%	3.596%	-0.003%	0.0004%	2.365%	-0.003%
Median	5.955	3.592	0	0	2.341	0
Std Deviation	0.159	0.045	0.055	0.021	0.170	0.059
Minimum	5.72	3.498	-0.22	-0.065	2.008	-0.264
Maximum	6.25	3.723	0.17	0.052	2.655	0.182
# of Observations	108	108	107	107	108	107
Correlation Coefficient			-0.0255			
Difference in Means			-0.5786			

<b>Table 3: 5-year Treasury Notes: 1998 Daily Yields</b>						
	Conventional Yield	TIIS Yield	Conventional Yield Change	TIIS Yield Change	Yield Spread	Yield Spread Change
Average	5.232%	3.773%	-0.004%	0.0003%	1.459%	-0.005%
Median	5.48	3.78	0	0	1.659	-0.006
Std Deviation	0.471	0.119	0.059	0.025	0.387	0.053
Minimum	4.14	3.365	-0.25	-0.141	0.66	-0.241
Maximum	5.80	3.934	0.18	0.092	2.015	0.153
# of Observations	247	247	246	246	247	246
Correlation Coefficient			0.4407			
Difference in Means			-1.1113			

<b>Table 4: 5-year Treasury Notes: 1999 Daily Yields</b>						
	Conventional Yield	TIIS Yield	Conventional Yield Change	TIIS Yield Change	Yield Spread	Yield Spread Change
Average	5.534%	3.831%	0.006%	0.0008%	1.703%	0.005%
Median	5.69	3.856	0	0	1.805	0.003
Std Deviation	0.413	0.119	0.054	0.022	0.346	0.053
Minimum	4.63	3.58	-0.15	-0.112	0.866	-0.139
Maximum	6.22	4.063	0.18	0.088	2.221	0.222
# of Observations	241	241	240	240	241	240
Correlation Coefficient			0.2402			
Difference in Means			<b>1.3859*</b>			

\* Significant at the 10% level.

<b>Table 5: 5-year Treasury Notes: 2000 Daily Yields</b>						
	Conventional Yield	TIIS Yield	Conventional Yield Change	TIIS Yield Change	Yield Spread	Yield Spread Change
Average	6.279%	3.822%	-0.004%	-0.002%	2.457%	-0.002%
Median	6.32	3.81	0	0	2.472	0
Std Deviation	0.342	0.194	0.049	0.028	0.23	0.049
Minimum	5.17	3.468	-0.14	-0.111	1.61	-0.135
Maximum	6.9	4.12	0.15	0.105	3.004	0.165
# of Observations	251	251	250	250	251	250
Correlation Coefficient			0.2851			
Difference in Means			-0.4457			

<b>Table 6: 5-year Treasury Notes: 2001 Daily Yields</b>						
	Conventional Yield	TIIS Yield	Conventional Yield Change	TIIS Yield Change	Yield Spread	Yield Spread Change
Average	3.504%	1.914%	-0.015%	-0.005%	1.59%	-0.01%
Median	3.74	1.906	-0.01	-0.006	1.906	-0.005
Std Deviation	1.029	0.587	0.084	0.103	0.840	0.105
Minimum	1.68	0.91	-0.65	-0.55	-0.509	-0.507
Maximum	5.27	3.66	0.33	0.527	2.885	0.49
# of Observations	243	243	242	242	243	242
Correlation Coefficient			0.3847			
Difference in Means			-1.1147			

Next, an analysis of daily yield changes was done using monthly averages of daily yields, since the inflation rate information is released on a monthly basis by the Bureau of Labor Statistics. Tables 7 and 8 show the monthly average spread, the annual realized rate of inflation (to calculate the inflation rate for July 1997, for example, the July 1997 CPI-U index and the July 1996 CPI-U index, both seasonally adjusted, were used), and the monthly difference between the spread and the inflation rate for 1997-2001.

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During the first year of trading, the yield differential was larger than the rate of inflation, by 30 basis points on average, and both measures declined throughout the year. The standard deviation of the inflation rate (0.22) was higher than the one for the yield spread (0.15). Starting in July 1998, the actual inflation rate exceeded the average difference in daily yields (yield spread) between the conventional yield and the TIIS yield, by as much as 80 basis points. Previous studies (see Emmons (2000) and Shelton (2000)) have mentioned that, due to liquidity reasons, the TIIS yield has remained a relatively high proxy for the real interest rate, and evidence of this is presented here. However, the liquidity premium cannot be as high as 80 basis points. Therefore, liquidity alone can not explain the behavior of the yield spread during this time.

In 1999, realized inflation was, again, greater than the difference in yields. However, the differential, spread minus inflation, increased significantly in 1999 (the average differential in 1998 was -0.09 compared to -0.5 in 1999). The differential kept increasing in 2000 (-0.9 compared to -0.5 in 1999), which indicates that the importance of the TIIS yield, as a proxy for the real interest rate, has declined over time, or that other factors (taxes for example) might have played a significant role during this period of time.

In 2001, the inflation rate declined, and the spread also declined, but not as fast (with a lag of at least a month). Furthermore, the differential, spread minus inflation, showed a substantial increase (-1.3 percent in 2001, compared to -0.9 percent in 2000), and the fluctuation in the daily spread also increased significantly (0.86 percent in 2001, compared to 0.23 percent in 2000). This last result seems particularly unusual, as I would expect the opposite to happen as the securities approach their final maturity. Furthermore, the TIIS liquidity and marketability issues, described by previous studies, should diminish in importance as the maturity of the securities become shorter and shorter (and investors, who might be concerned about holding illiquid securities for a long time, find these shorter-maturity securities more attractive). Indeed, the yield spread went from a low of 1.73 percent in January 2001 to a high of 2.49 percent in June 2001. Starting in June, the yield spread showed a remarkable decline. Table 8 shows that the yield spread became negative towards the end of the year, which might be the result of the September 11 events (this negative yield spread continued during the first days of 2002). Finally, for the first time in five years, daily TIIS yields showed a higher variability than daily conventional yields.

**Table 7: 5-Year Treasury Notes: Average of Daily Yields (1997-1999)**

	1997			1998			1999		
	Spread	Inflation	Difference	Spread	Inflation	Difference	Spread	Inflation	Difference
January	-	-	-	1.71%	1.63%	0.08	1.00%	1.73%	-0.73
February	-	-	-	1.78	1.44	0.34	1.29	1.67	-0.38
March	-	-	-	1.84	1.38	0.46	1.35	1.79	-0.44
April	-	-	-	1.77	1.44	0.33	1.40	2.28	-0.88
May	-	-	-	1.75	1.69	0.06	1.74	2.09	-0.35
June	-	-	-	1.70	1.62	0.07	2.00	1.97	0.03
July	2.37%	2.17%	0.21	1.65	1.68	-0.04	1.69	2.15	-0.45
August	2.57	2.29	0.28	1.50	1.62	-0.12	1.83	2.26	-0.43
Sept.	2.47	2.22	0.25	1.13	1.43	-0.30	1.85	2.57	-0.71
October	2.34	2.09	0.25	0.80	1.49	-0.68	2.07	2.56	-0.49
Nov.	2.27	1.89	0.38	0.98	1.48	-0.50	2.00	2.62	-0.62
Dec.	2.16	1.70	0.46	0.87	1.67	-0.80	2.09	2.67	-0.59
Average	2.36	2.06	0.31	1.46	1.55	-0.09	1.69	2.20	-0.50
Std Dev	0.15	0.22	0.10	0.39	0.11	0.41	0.36	0.36	0.23

**Table 8: 5-Year Treasury Notes: Average of Daily Yields (2000-2001)**

	2000			2001		
	Spread	Inflation	Difference	Spread	Inflation	Difference
January	2.36%	2.73%	-0.37	1.73%	3.72%	-1.99
February	2.54	3.22	-0.68	2.04	3.53	-1.49
March	2.64	3.70	-1.06	2.11	2.98	-0.87
April	2.66	3.07	-0.42	2.13	3.28	-1.14
May	2.81	3.13	-0.32	2.39	3.62	-1.24
June	2.48	3.73	-1.26	2.49	3.25	-0.76
July	2.43	3.60	-1.18	2.09	2.72	-0.64
August	2.46	3.35	-0.89	1.53	2.72	-1.19
September	2.35	3.52	-1.17	1.10	2.59	-1.49
October	2.41	3.45	-1.04	1.04	2.13	-1.08
November	2.41	3.44	-1.04	0.36	1.89	-1.53
December	1.88	3.38	-1.50	-0.32	1.55	-1.87
Average	2.45	3.36	-0.91	1.56	2.83	-1.28
Std Dev.	0.23	0.29	0.38	0.86	0.70	0.42

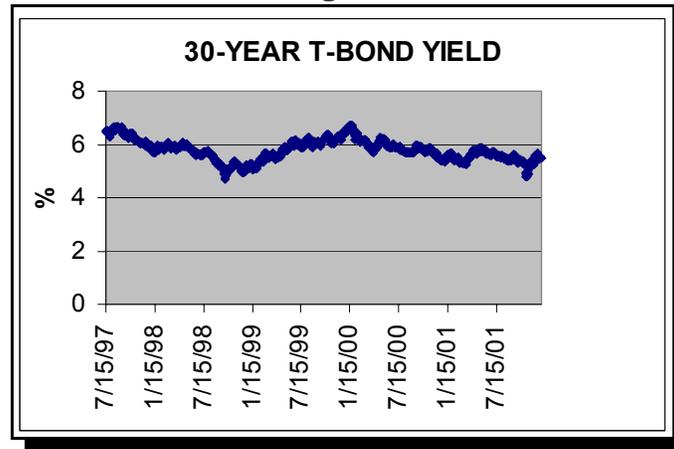
The evidence presented here does not support my first hypothesis as the yield spread, the yield on a conventional Treasury note minus the yield on a Treasury inflation-indexed security, has not been a useful proxy for the rate of inflation. For comparison purposes, this study uses an actual rate of inflation. Craig (2003) explains that the expected rate of inflation for this period of time, 1997-2001, was about 2.5 percent. Therefore, regardless of the proxy for inflation used, the yield spread has not been an accurate estimator of the inflation rate. Also, the results do not support my second hypothesis that the yield spread has remained more or less constant throughout the entire maturity of the 5-year notes. The spread changed considerable during 1997-2001. Figure 1 provides evidence of the fluctuation in the yield spread during this period.

For comparison purposes, Figure 2 and Figure 3 show the trend of alternative investments during this period of time. Figure 2 shows the daily yield on the 30-year Treasury bond, and Figure 3 shows the monthly returns of the S&P500 index. The long-term rate hovered around 6 percent throughout the entire period, while the monthly returns on the S&P500 index ranged from a low of -14 percent to a high of 11 percent (average return was 0.09 percent). Table 1 shows the average TIIS yield to be 3.36 percent for 1997-2001. The total return, average TIIS yield plus the average rate of inflation of 2.43 percent, would have made 5-year Treasury inflation-indexed securities a very attractive investment vehicle during this period of time. On the other hand, the Treasury Department may have to reevaluate TIIS, as these new securities might not have lowered the government's borrowing costs.

**Figure 1**

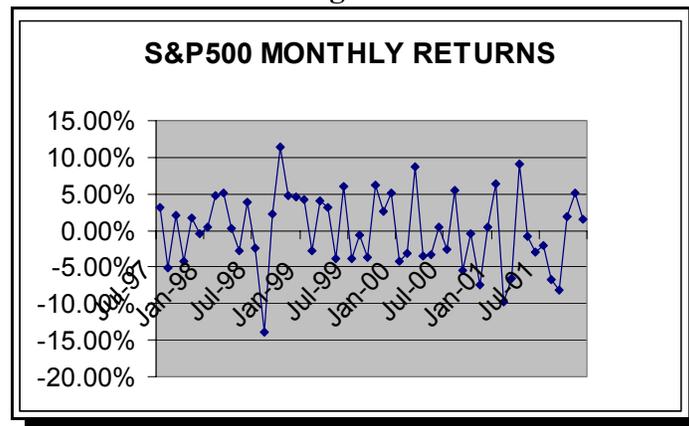


Figure 2



Source: YahooFinance.com website

Figure 3



Source: YahooFinance.com website

## SUMMARY AND CONCLUSIONS

This study examines the daily yields of conventional Treasury securities and inflation-indexed Treasury securities almost throughout their entire maturity. The evidence indicates a low correlation between conventional yields and TIPS yields, which suggests that TIPS should provide portfolio diversification benefits. The volatility of daily yields, for the most part, is much higher for conventional securities than for TIPS. The yield spread is much lower than the actual rate

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of inflation (or expected inflation) and keeps increasing as the securities near maturity (even though the variance seems to remain constant). At the end of 2001, the yield spread starts a sudden decline. In essence, the yield spread has not been a reliable proxy for the rate of inflation and has exhibited a volatile pattern during the years 1997-2001. However, TIPS yields might have provided an attractive investment alternative, compared to bond and stock returns, during this period of time.

The results seem to support the evidence presented by other studies that have documented the inadequate performance of the TIPS yield as a proxy for the real interest rate. Liquidity alone can not explain this performance. Investors should be purchasing TIPS in greater amounts if the federal government is paying a high real interest rate, as reflected by TIPS yields, and if TIPS exhibit desirable portfolio diversification benefits.

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# **FINANCIAL STATEMENT FOOTNOTE DISCLOSURES- PURPOSES, SUBJECT AND NUMBER: THE HONG KONG EXPERIENCE**

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## **ABSTRACT**

*International financial markets are rapidly becoming a single global market. For these markets, most large institutional users are not satisfied with the existing levels of disclosures by multinational firms. One purpose of this research study was to investigate existing footnote disclosure practices for companies in Hong Kong. This study classified, summarised and analysed financial statement disclosures for Hong Kong companies. In a recent US study, Barth and Murphy (1994) developed a framework to analyse the required footnotes for companies in the United States. This study uses a similar approach to examine the situation in Hong Kong. However, there are some significant differences. The Barth and Murphy study is extended to include the review of actual disclosures in Hong Kong financial statements. In this way, this project attempts to determine if existing disclosures for Hong Kong companies can be classified according to the purposes identified in the US study and by a review of Hong Kong standards. Descriptive statistics are provided for all disclosures. The results indicate that similar purposes have been met for Hong Kong companies traded on the Hong Kong Stock Exchange.*

*Keywords: footnote disclosures, Hong Kong accounting practices*

## **PURPOSE**

The purpose of this research study was to investigate existing footnote disclosure practices for financial statements in Hong Kong to determine if the existing disclosure requirements are comparable to the requirements in the US. This project is an attempt at helping to establish a conceptual framework to help evaluate any proposed disclosure requirements. The study classified, summarized and analyzed the footnote disclosures for a sample of Hong Kong companies. In an US study, Barth and Murphy (1994) developed a framework to analyze the required footnotes for companies in the United States. This study uses a similar approach to examine the situation in Hong Kong. However, there are some significant differences. The Barth and Murphy study is extended

to include the review of actual disclosures in financial statements. In this way, this project attempts to determine if existing disclosures for Hong Kong companies can be classified according to the purposes identified in the US study and by a review of Hong Kong standards. A general comparison between the results for this study and the Barth and Murphy US study will be conducted as part of this project. No other similar study was identified during the literature search. A brief discussion of the IASC requirements is included in the international experience section.

## **BACKGROUND**

International financial markets are rapidly becoming a single global market. For these markets, most large institutional users are not satisfied with the existing levels of disclosures by multinational firms (Taylor, 1995). In Hong Kong, different groups are concerned about disclosure issues. Ms. Cha, Securities and Futures Commission (SFC) executive director, has stated it was important to adopt international standards as part of the SFC and stock exchange's commitment to maintaining Hong Kong's competitiveness (Ibison, 1995). Also, a committee of the Hong Kong Society of Accountants announced a proposal that was submitted to the society's council in 1996 that included changes in corporate governance disclosure practices for implementation. For example, some are not happy about company disclosure reporting practices related to boards of directors. The Stock exchange listing division chief has criticized Hong Kong company board of directors for failing to disclose connected transactions as required by listing rules. He stated ignorance of the rules is not a valid excuse and the stock exchange is investigating some companies for not disclosing transactions with related parties. In most cases, the related party deals were not uncovered until public accountants did their audit (Tsang and Parwani, 1998).

Others in different countries have also suggested that there is a need to consider changes in current disclosure requirements. Recently in the United States (US), the Financial Accounting Standards Board (FASB) has issued a prospectus, "Disclosure Effectiveness" with a comment deadline of November 30, 1995 (status unchanged as of August 1999) that discusses the need for changes.

Groves (Hewett, 1995), retired chairman of Ernst and Young LLP, wrote an article that asserted, "Important information is getting lost in a disclosure forest, because our present system does not distinguish between information that's critical for decision making and nonessential data".

Groves calculated that the number of pages of footnotes has increased at a compound rate of 7.5 percent per year since 1972 in the United States and the Management's Discussion and Analysis has increased at a rate of 7.2 percent. Foreign firms attempting to access the US capital markets also have criticized US disclosure requirements. Freund, former chief economist at the New York Stock Exchange (NYSE), argues that additional US disclosures do not contribute to market efficiency and therefore foreign firms should be able to list on US Exchanges without providing the additional disclosures required by US generally accepted accounting principles. Mr. Freund stated the

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Securities and Exchange Commission's (SEC) refusal to permit foreign companies to list on US Exchanges without conforming to US accounting rules compels US investors to purchase those securities on foreign exchanges. This results in higher costs to the investors and hinders the ability of US Exchanges to compete for international listings.

Shapiro of the SEC responded to Freund by observing that studies have shown that the SEC requirements provide valuable information to the market place and those transnational listings on the NYSE are growing at a significantly faster rate than similar listings on major foreign exchanges. Apparently little is known about the disclosure situation in Hong Kong. This study is an attempt to provide information about financial statement disclosure requirements in Hong Kong.

### **Hong Kong Experience**

The Hong Kong Society Of Accountants (HKSA), on September 8, 1995, issued the exposure draft, "Financial instruments-disclosure and presentation" with a comment deadline of November 30, 1995. The status of this exposure draft has not changed. The purpose of the required disclosures, as stated, is to provide users of financial statements with information that will enhance their understanding of the significance of on-balance sheet and off-balance sheet financial instruments to an enterprise's financial position, performance and cash flows and assist them in assessing the amounts, timing and certainty of future cash flows associated with those instruments. These purposes are consistent with the identified purposes in the Barth and Murphy US 1994 study and with some modification with the framework used in this study (see discussion in methodology section). The exposure draft is based on the standards, background material and implementation guidance in the International Accounting Standard IAS 32, "Financial Instruments: Disclosure and Presentations" issued in 1995.

The Hong Kong Society of Accountants has decided to use the work done by the International Accounting Standards Committee as a guide to developing new standards for Hong Kong. In the past, standards have more closely followed the United Kingdom (UK) practices. These changes will have an impact on the development of any new Hong Kong standards. At present, there are nineteen Statements of Standard Accounting Practices (HKSSAP) that have been issued by the HKSA. The form and content of published accounts are governed by the requirements of these statements, the Companies Ordinance, The Stock Exchange of Hong Kong Limited and generally accepted accounting principles. All companies must comply with the Tenth Schedule to the Companies Ordinance (S.123 (2)). This Tenth Schedule specifies the minimum requirements for disclosures (Hui and Ng, 1995). The list includes items that need to be provided as notes to the accounts in order to explain and supplement the information included in the formal financial statements.

The Accounting Standards Committee (ASC) was established by the HKSA in February 1982 to provide guidance for the preparers of financial statements in Hong Kong. In 1994, the

ASC was replaced by the Financial Accounting Standard Committee (FASC). This new group is responsible for the identification of areas for new guidance and recommendations of priorities for topics. Before 1993, most accounting standards were based on UK practices. As discussed, since 1993, Hong Kong standards have been based on the approaches developed by the International Accounting Standards Committee (IASC).

In the next section, other studies in the disclosure area will be described to provide some general background.

### **International Experience**

Almost all countries require the disclosure of accounting policies. In a recent survey of thirty-four countries, only China and Norway did not require the disclosure of accounting policies (Coopers and Lybrand, 1993). For those two countries, the disclosures are optional. The IASC, along with Hong Kong and the United States, do require accounting policy disclosures. The disclosure of the significant accounting policies used should be an integral part of the financial statements. For specific disclosure topics, the requirements are also similar for the IASC, Hong Kong and the United States. For example, post balance sheet events must be disclosed in the notes to the financial statements if there is not evidence of conditions that existed at the balance sheet date for the IASC, HK and US. For some other areas such as related party transactions, there are differences. The IASC requires the disclosure of certain details for all related party transactions. Hong Kong requires the disclosure of certain information relating to affiliated companies and details of certain transactions with directors. All material transactions with related parties must be disclosed in the US (Coopers and Lybrand, 1993). In the next section, more details will be provided.

### **United States**

In the United States, the distinction between recognition and disclosure has become increasingly important. However, there has been a recent focus on disclosure requirements as compared to the past where the emphasis had been on recognition requirements. Disclosure of information about the items in financial statements and their measures that may be provided by notes or parenthetically on the face of financial statements, by supplementary information, or by other means of financial reporting is not a substitute for recognition in financial statements for items that meet recognition criteria (FASB, 1984). Some FASB standards are only disclosure requirements at this time.

The Financial Accounting Standards Board (FASB) has identified the possible purposes of disclosures in Statement of Financial Accounting Standard (SFAS) Number 105, "Disclosure of Information About Financial Instruments with Off-Balance-Sheet Risk and Financial Instruments

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with Concentrations of Credit Risk". In Hong Kong as discussed, the Society of Accountants has issued an exposure draft, "Financial Instruments-disclosure and presentation" on September 8, 1995 that addresses many of the same issues. The purposes can be summarized into the following three ones, 1) describe recognized items and provide relevant measures of those items other than the measure in the financial statements, 2) describe unrecognized items and provide an useful measure of those items, and 3) provide information to help investors and creditors assess risks and potentials of both recognized and unrecognized items. Johnson (1992), a research manager at the FASB, has asked if the three general purposes are complete.

The sheer volume of the disclosures has led to concerns by some members of the FASB about disclosure overload and whether the more important disclosure information is being obscured by the large amount of other information that is required (Johnson, 1992). In a recent study, Streuly (1994) concludes only three percent of users feel current disclosures in the US are excessive and forty-four percent say more information should be provided.

### **Disclosure Differences Throughout The World**

Johnson (1992) asked in what ways US disclosure requirements are significantly different from those in other major countries. In addition, he has asked what the implications of those differences are for the global harmonization of financial reporting.

Some researchers have investigated the differences in accounting requirements for different countries in the world. In one study, the disclosure frequency was greater in the US than in the UK for the sample firms (Frost and Pownall, 1994). A firm is likely to release similar financial statements in the US and UK, but its other disclosures may be different because of different local conditions. By implication, US and HK disclosure requirements should be similar because the HK disclosures have been based on UK requirements before 1993.

Researchers in other countries have investigated other aspects. In Canada, a study examined why companies disclosed non-historic cost information recommended, but not required by Section 4510 of the Canadian Institute of Chartered Accountants and found that disclosure depended on such factors as materiality, who the company's auditor was and whether the company was listed on a US Stock exchange as well as a Canadian one (Hanna et. al., 1990). In a US study, Fesler and Hagler (1989) provided evidence from actual litigation that implies the need for disclosure reform for uncertain events. A special committee of the American Institute of Certified Public Accountants (AICPA) has recommended substantial increases in financial statement disclosures (Newell and Fransson, 1994). However, members of the Financial Executive Institute (FEI) in the United States are concerned about the proposal because of the perceived increase in costs and possible disclosure of sensitive competitive data.

## METHODOLOGY

The first step in this study was to identify the existing disclosure requirements in Hong Kong by examining the HKSA's Original Statements. The purposes of disclosures are inferred from the existing requirements. A list of Hong Kong disclosure standards and guidelines is in Table 1.

<b>Table 1 List of Standards</b>	
Statements of Standard Accounting Practice	Issued/ Reviewed
Disclosure of Accounting Policies	Mar/84
Extraordinary Items and Prior Year Adjustments	Mar-84
Stocks and Work in Progress	Oct-90
Statements of Changes in Financial Position	Jul-86
Earnings Per Share	Jul-90
Depreciation Accounting	Nov-87
Group Accounts	Mar-84
Accounting for Contingencies	Mar-84
Accounting for Post Balance Sheet Events	Mar-84
Accounting for Associated Companies	Jul-91
Foreign Currency Translation	Jul-86
Accounting for Deferred Tax	Jul-87
Accounting for Investment Properties	Jul-90
Accounting for Leases and Hire Purchase Contracts	Aug-88
Cash Flow Statements	Sep-92
Research and development costs	Sep-94
Plant and Equipment	Jul-95
Revenue	Sep-95
Borrowing	May-96
Accounting Guidelines	
Preparation & Presentation of Accounts from Incomplete Records	Mar-84
The Effect of International Accounting Standards	Jul-87
Accounts of Dealers in Securities	Nov-86
Accounting for Goodwill	Jul-91
Capitalisation of Borrowing Costs	Oct-85
Reporting Financial Information by Segment	Jun-86
Accounting for Textile Quota Entitlements	May-89

Fifty-two companies traded on the Hong Kong Stock Exchange in 1996 were examined to determine existing financial statement disclosure practices. A systematic selection process (every tenth annual report was picked starting from a random point) was used to select the companies for this study. Data had to be hand collected in each case. This lack of available information makes any analysis more difficult and inefficient. In the future, the development of a more complete database would be useful for future research. Because of the relative small sample size and difficulty in obtaining data, the results were not broken down and analyzed by industry. The fifty-two companies selected represent approximately nine percent of all the companies traded on the Hong Kong Stock Exchange. Please see Table 2 for list of selected companies.

	Company name	No. of items	No. of pages
1	Amoy Properties Limited	25	18
2	Asia Financial Group	25	18
3	Cafe De Coral Holdings Limited	23	19
4	CDW International Limited	27	16
5	Chevalier International Holdings Limited	31	18
6	China motor Bus Co. Ltd.	23	10
7	China Travel International Investment HK Limited	32	25
8	China-Hongkong PhotoProducts Holdings Ltd.	24	13
9	Chow Sang Sang Holdings International Limited	30	30
10	Chung Tai Printing Holdings Limited	29	15
11	Dah Sing Financial Group	31	16
12	Dao Heng Bank Group Limited	31	26
13	Dickson Construction International Limited	33	22
14	Emperor International Holdings Limited	31	29
15	Eu Yan Sang (Hong Kong) Limited	20	12
16	Gold Peak Industries (Holdings) Limited	33	32
17	Golden Harvest Entertainment (Holdings) Limited	27	19
18	Grand Hotel Holdings Ltd.	20	12
19	Great Wall Electronic International Limited	30	31
20	Group Sense (International) Limited	24	20
21	Guangdong Investment Ltd.	38	43
22	Hang Lung Development Company Limited	29	22
23	Hang Seng Bank Limited	35	32

<b>Table 2</b>			
Company name		No. of items	No. of pages
24	Henderson Investment Limited	23	12
25	HKR International Limited	40	41
26	Hong Kong Daily News Holdings Limited	37	24
27	Hongkong China Limited	31	29
28	Hongkong Electric Holdings Limited	21	8
29	Hongkong Telecom	25	15
30	HSBC Holdings plc	45	32
31	Jusco Stores (Hong Kong) Co. Ltd.	24	13
32	New World Development Co. Ltd.	33	36
33	Ngai Hing Hong Company Limited	26	17
34	Orient Overseas (International) Limited	24	20
35	Pearl Oriental Holdings Limited	34	26
36	Peregrine Investments Holdings Limited	26	21
37	Pico Far East Holdings Ltd. (Cayman Islands)	34	22
38	Playmates Toys Holdings Limited	26	16
39	Shanggri-La Asia Limited	32	26
40	Shanghai Petrochemical Co. Ltd.	25	18
41	Shonggang Concord Grand (Group) Ltd.	29	21
42	South China Brokerage Company Limited	26	16
43	South China Morning Post	28	14
44	Star Paging (International Holding) Limited	33	23
45	The Bank of East Asia Limited	25	17
46	The Kowloon Motor Bus Company (1933) Limited	21	12
47	The Kwong Sang Hong International Limited	23	18
48	The Shui Hing Company Limited	27	24
49	Tomei International (Holdings) Ltd.	26	27
50	Tse Sui Luen Jewellery (International) Limited	35	38
51	World International (Holdings) Limited	19	12
52	Yaohan Hong Kong Corporation Limited	25	22

In the Barth and Murphy (1994) study, the researchers found the three purposes described in the US section on page four were too general. This study will also address some of these same issues in Hong Kong. For this study, the purposes needed to be broken down into six purposes to be meaningful (See Table 3). Each of the six purposes deals with only one specific issue. Existing disclosures were categorized and classified according to these six purposes. Three of the purposes were broken into two "finer" subpurposes each.

Purpose	Example
1. Describe recognized items and provide relevant measures of those items other than the measure in the financial statements 1a (describe) 1b (disaggregate)	The Earnings Per Share Items in Current Assets
2. Describe unrecognized items and provide a useful measure of those items 2a (describe) 2b (disaggregate)	Description of the Retirement Benefits Scheme Amount of lease commitments
3. Provide information to help investors and creditors assess risks and potentials of both recognized and unrecognized items 3a (describe) 3b (risk/potentials)	Description of various investment undertaken by the company The area of investments
4. Provide information that allows financial statement users to compare numbers to other companies	Stating the accounting policy adopted by the company
5. Provide information on future cash inflows or outflows	Provide the amount of capital commitments
6. Help investors assess return on their investment	Dividend paid for the year

Descriptive statistics are provided for all disclosures. A disclosure item refers to each separately stated requirement to disclose a number and or piece of information. The basic framework developed in the Barth and Murphy (1994) study is used where the disclosure items are broken into three groups. The three groups are General, Entity Structure, and Specialized Transactions. Entity Structure disclosures include parent, consolidated statements and group reorganization. Specialized Transactions included exceptional items and post balance sheet events. This study included all other disclosures in the General category. The categories were modified for the differences in Hong Kong requirements. Not all categories were needed because of the different reporting requirements. For example, the classification, extraordinary is used only in rare instances

in Hong Kong. Accounting changes are also handled differently in Hong Kong as compared to the US.

Table 3 presents the final list of six primary purposes and examples. The first purpose, describe recognized items and provide relevant measures of those items other than the measure in the financial statements, is further broken down into two "finer" or sub purposes: 1a. Describe item, and 1b. Disaggregate item. The second purpose, describe unrecognized items and provide a useful measure of those items, was also broken down into two sub purposes: 2a. Describe item and 2b. Disaggregate item.

For the third purpose, provide information to help investors and creditors assess risks and potentials of both recognized and unrecognized items, two more specific purposes were listed as 3a. Provide description, and 3b. Provide description to assess risks and potentials.

The fourth purpose was included to determine if disclosures provide information that allows financial statement users to compare numbers to other companies. The last two purposes were also not broken down into "finer" subpurposes because the purpose was considered specific enough for classification. The fifth purpose was listed as, 5. Provide information on future cash flows or outflows. The sixth purpose was specified as, 6. Help investors assess return on their investment. In the next section, the results are presented.

The classifications of the disclosures did involve some judgments. Discussions between colleagues were held to help minimize this problem. Examples from the Barth and Murphy study were studied to also increase the comparability between this study and the Barth and Murphy study. Some annual reports were examined a second time at a later time. The resulting classifications were compared to the initial evaluation to determine that the disclosures were being classified consistently. Disclosure misclassification was not a major problem. Also, some disclosure items did have more than one purpose.

## RESULTS

In this section, the existing disclosures categorized by purpose are presented. All observed disclosures were classified and included in one of the six general purposes. The review of existing disclosures reveals 1,703 items for the companies (General 1,577: Entity 58: Specialized Transactions 68). Tables 4 and 5 present descriptive statistics about the purposes for required disclosures including their frequencies and the subject each disclosure relates to in each case.

### **Frequency and Patterns of Disclosure Purposes**

The number of disclosure items serving each disclosure purpose broken down by the three groups, general, entity structure and specialized transactions and by total is presented in Table 4.

Table 4 Frequency of Disclosure Items by Purpose												
Purpose	General			Entity Structure			Specialized Transactions			Total		
	#	%1	%2	#	%1	%2	#	%1	%2	#	%1	%2
• Describe recognized items and provide relevant measures of those items other than the measure in the financial statements												
1a (describe)	108	6.848	16.02	9	15.52	81.82	9	13.24	32.14	126	7.399	17.67
1b (disaggregate)	566	35.89	83.98	2	3.448	18.18	19	27.94	67.86	587	34.47	82.33
Total	674	42.74	100	11	18.97	100	28	41.18	100	713	41.87	100
2. Describe unrecognized items and provide a useful measure of those items												
2a (describe)	68	4.312	35.05	13	22.41	81.25	12	17.65	100	93	5.461	41.89
2b) disaggregate)	126	7.99	64.95	3	5.172	18.75	0	0	0	129	7.575	58.11
Total	194	12.3	100	16	27.59	100	12	17.65	100	222	13.04	100
3. Provide information to help investors and creditors assess risks and potentials of both recognized and unrecognized items												
3a (describe)	84	5.327	60.43	18	31.03	100	0	0	####	102	5.989	64.97
3b (risk/potentials)	55	3.488	39.57	0	0	0	0	0	####	55	3.23	35.03
Total	139	8.814	100	18	31.03	100	0	0	####	157	9.219	100
4. Provide information that allows financial statement users to compare numbers to other companies and between years												
	208	13.19	100	13	22.41	100	0	0	####	221	12.98	100
5. Provide information on future cash inflows or outflows												
	198	12.56	100	0	0	100	0	0	100	198	11.63	100
6. Help investors assess return on their investment												
	164	10.4	100	0	0	100	28	41.18	100	192	11.27	100
Grand Total	1577	100	100	58	100	100	68	100	100	1703	100	100

### Purposes 1a and 1b

Table 4 indicates that more disclosures serve the first purpose, describes recognized items and or provides relevant measures of those items other than the measure in the financial statements, than any other. It represents 41.9 percent of all disclosures (714/1703). This is consistent with the Barth and Murphy (1994) results in the United States and also is expected with the assumed focus on recognized amounts and the relatively high level of aggregation. A slightly higher percentage (42.8%) of the general category fulfills this purpose. Purpose 1b (disaggregation) accounts for 83.9 percent of the disclosures for the first general purpose. Table 5 indicates the six most common subjects for disaggregation are dividends, fixed assets, taxation, reserves, cash flow from operations and interest in subsidiaries. For entity structures, only consolidated financial statements (2 disclosures) are indicated as meeting purpose 1b. Only exceptional items (19 disclosures) fulfill purpose 1b for specialized transactions.

<b>Table 5 Number of Required Disclosure Items by Purpose, by Subject</b>										
	<b>Disclosure Purpose</b>									<b>Total</b>
	<b>1a</b>	<b>1b</b>	<b>2a</b>	<b>2b</b>	<b>3a</b>	<b>3b</b>	<b>4</b>	<b>5</b>	<b>6</b>	
<b>General</b>										
Accounting Policies	0	0	0	0	0	0	52	0	0	52
Accounts Payable	0	2	0	0	0	0	0	2	0	4
Accounts Receivable	0	9	0	0	0	0	0	9	0	18
Approval of Financial Statements	0	0	14	0	0	0	0	0	0	14
Bank Loans	3	24	0	0	0	0	0	27	0	54
Capital Commitments	0	2	12	13	0	0	0	18	0	45
Comparative Figures	0	0	24	0	0	0	0	0	0	24
Contingent Liabilities	3	2	8	31	20	24	0	30	0	118
Current Assets	0	39	0	0	0	0	0	0	0	39
Current Liabilities	0	37	0	0	0	0	0	0	0	37
Deferred Taxation	2	28	0	2	0	0	0	32	0	64
Directors Emoluments	0	0	2	37	0	0	0	0	0	39
Dividends	0	52	0	0	0	0	52	0	52	156
Earnings Per Share	52	0	0	0	0	0	52	0	52	156
Financial Statements of Past Years	0	0	0	0	0	0	0	0	0	0
Fixed Assets	0	51	0	0	0	0	0	0	0	51
Interest in Subsidiaries	0	42	0	1	17	20	0	0	0	80
Investment	0	35	0	0	21	11	0	28	8	103
Lease Commitments	0	0	0	26	0	0	0	26	0	52
Net Cash Flow from Operating Activities	0	42	0	10	0	0	0	0	0	52
Operating Expenses	0	6	0	0	0	0	0	0	0	6
Profit Attributable to Shareholders	19	33		0	0	0	52	0	52	156
Reserves	1	42	0	0	0	0	0	0	0	43
Retirement Benefits Scheme	5	6	8	6	26	0	0	26	0	77
Share Capita	1	14	33	0	0	0	0	0	0	047

<b>Table 5 Number of Required Disclosure Items by Purpose, by Subject</b>										
	<b>Disclosure Purpose</b>									<b>Total</b>
	<b>1a</b>	<b>1b</b>	<b>2a</b>	<b>2b</b>	<b>3a</b>	<b>3b</b>	<b>4</b>	<b>5</b>	<b>6</b>	
Stocks	0	14	0	0	0	0	0	0	0	14
Taxation	2	46	0	0	0	0	0	0	0	48
Turnover	7	21	0	0	0	0	0	0	0	28
	<b>108</b>	<b>566</b>	<b>68</b>	<b>126</b>	<b>84</b>	<b>55</b>	<b>208</b>	<b>198</b>	<b>164</b>	<b>1577</b>
<b>Entity Structure</b>										
Consolidation Financial Statement	1	2	0	0	3	0	0	0	0	6
Parent/Ultimate Holding Company	4	0	6	0	0	0	0	0	0	10
Disclosure Requirements	1	0	0	0	0	0	0	0	0	1
Changing in Financing during the year	3	0	0	3	13	0	13	0	0	32
Group Reorganization	0	0	7	0	2	0	0	0	0	9
	<b>9</b>	<b>2</b>	<b>13</b>	<b>3</b>	<b>18</b>	<b>0</b>	<b>13</b>	<b>0</b>	<b>0</b>	<b>58</b>
<b>Specialized Transactions</b>										
Exceptional Items	9	19	0	0	0	0	0	0	28	56
Post Balance Sheet Event	0	0	12	0	0	0	0	0	0	12
	<b>9</b>	<b>19</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>28</b>	<b>68</b>

Table 5 reveals that the frequencies vary across purposes. For example, it indicates 108 general disclosure items describe recognized items. Table 4 shows that these items represent 6.8% of all required disclosure items, and table 5 indicates of these 108 items, 52 relate to earnings per share, 19 relate to profit attributable to shareholders, 14 to share capital, 7 to turnover, 3 to bank loans and 3 to contingent liabilities. Thus Tables 3, 4 and 5 should be read in conjunction with one another.

### **Purposes 2a and 2b**

Disclosures that require descriptions of unrecognized items and provide a useful measure of those items are not as frequent, but are still seen thirteen percent (222/1703) of the time. As with

disclosures about recognized items, disaggregation disclosure (2b) is more frequent than descriptions of unrecognized items (2a). For the general purpose, the three most common disaggregation items were directors' emoluments (twenty-nine percent), contingent liabilities (twenty-five percent), and lease commitments (twenty-one percent). For descriptions of unrecognized items, comparative figures were included thirty-five percent of the time, approvals of financial statements, twenty-one percent and capital commitments, eighteen percent.

### **Purposes 3a and 3b**

Table 4 indicates that only 9% of required disclosures provide information to help investors and creditors assess risks and potentials of both recognized and unrecognized (3a and 3b) making it the sixth or least frequently observed primary purpose. Sixty-five percent of the disclosures met purpose 3a (description) and 35% met the second sub-purpose 3b (risk/ potential). For the general category (3a), there were specific disclosures for only four categories, retirement benefits scheme (thirty-one percent), interest in subsidiaries (twenty percent) and investments (twenty-five percent) and contingent liabilities (twenty-four percent). For 3b, only three categories were identified, contingent liabilities (forty-four percent), interest in subsidiaries (thirty-six percent) and investment (twenty percent). For entity structures, only eighteen examples of a (3a) description of the risks and potentials were identified (seventy-two percent - changing in financing during the year, seventeen percent - consolidated financials, eleven percent - group reorganization) . No examples of specialized transactions for purpose 3 were noted during the study.

### **Purpose 4**

Table 4 reveals that only 13% of the total disclosures (221 items) provide direct information that allows financial statement users to compare numbers to other companies. For the general category, all the observed items were descriptions of policies, dividends, earnings per share or profit attributable to shareholders.

### **Purpose 5**

Table 4 shows disclosures that provide information on future cash inflow or outflows were identified 11.6% of the time for all disclosure items (198/1703). For the general category, the three most frequent items related to deferred taxation (16.2%), contingent liabilities (15.2%), and investment (14.1%). All items observed for purpose five were included in the general category.

## Purpose 6

Disclosures directly intended to help investors assess their return on investment were included approximately eleven percent of the time for all disclosures. For the general category, only four areas were included, dividends (32%), earnings per share (32%) and profit attributable to shareholders (32%) and investment (4%). For specialized transactions, only exceptional items were included for a total of 28 times (100%).

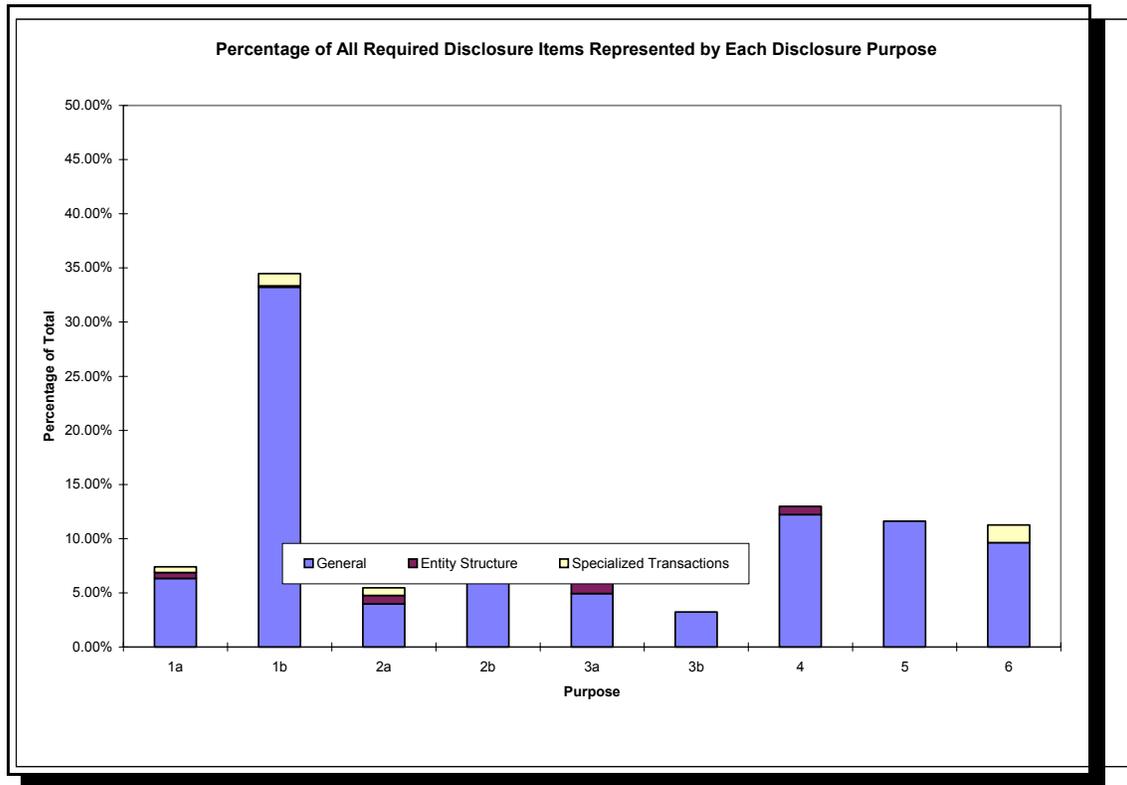
## General Observations

Several subjects have many required disclosures. By examining Table 5, it is noted that the most frequent disclosure requirements relate to dividends (9.9%), earnings per share (9.9%), profit attributable to shareholders (9.9%), contingent liabilities (7.5%) and investment (6.5%). These five categories account for 43.7% (690/1577) of the disclosures in the general category. There were twenty-seven different categories with the two fewest mentioned categories being accounts payable (.2%) and operating expenses (.3%). The average number of pages for footnote disclosures was 22. The annual reports had an average of 28 footnote disclosures per company.

Other general results follow:

1)	Forty-one percent of all disclosures describe recognized items or provide relevant of those other than the measure in the financial statements (first Purpose).
2)	Eighty-three percent of the general disclosures that meet the first purpose relate to disaggregation.
3)	Disclosures that require descriptions of unrecognized items or provide a useful measure of those items were seen 13 % of the time (second purpose).
4)	Only 9.2 % of required disclosures provide information to help investors and creditors assess risks and potentials of both recognized or unrecognized items (third purpose).
5)	Thirteen percent provide direct information that allows financial statement users to compare numbers to other companies (fourth purpose).
6)	Eleven percent of the disclosures provide information on future cash inflow or outflows (purpose five).
7)	Another 11 % were directly intended to help investors assess their return on investment (purpose six).

Please see Table 5 for details. The relative percentages in graph format for all required disclosure items represented by each disclosure purpose are presented in Table 6.

**Table 6**

The percentages are broken down into the general, entity structure and specialized transactions categories.

### SUMMARY AND CONCLUDING REMARKS

This study summarizes, classifies and analyses financial statement disclosures for Hong Kong companies. At this time, the Hong Kong Society of Accountants does not have a well-defined conceptual framework to use as a guideline for establishing disclosure requirements for any new accounting standards. Other countries face a similar situation. First, this study used an inductive approach in an attempt to identify the general purposes as a preliminary step to help establish such a conceptual framework. Next, existing disclosures were examined to determine the purposes these actual disclosures were meeting for Hong Kong companies. It is hoped this study will provide a starting point for evaluating any new proposed disclosure requirements in Hong Kong. The results can hopefully be used to confirm that all the appropriate purposes have been identified. All actual disclosures were classified as meeting, at least, one of the identified purposes. If a disclosure had not been classified, this would have provided evidence that not all purposes had been identified. Of

course, this is a type of negative assurance so any conclusions must be evaluated carefully. A comparison between the results of this study and the similar study in the United States is shown in Table 7.

		HK Percentage	US Percentage *
1.	Percentage of all disclosures that describe recognized items or provide relevant measures of those items other than the measure in the financial statements (first purpose).	37	41
2.	Percentages of the disclosures that meet the first purpose relate to disaggregation	83	70
3.	Percentage of disclosures that require descriptions of unrecognized items or provide an useful measure of those items.	13	6
4.	Percentage of required disclosures that provide information to help investors and creditors assess risks and potentials of both recognized or unrecognized items.	9	31
5.	Percentage that provide direct information that allows financial statement users to compare numbers to other companies or between years.	13	16
6.	Percentage of the disclosures that provide information on future cash inflow or outflows.	11	4
7.	Percentage that was directly intended to help investors assess their return on investment.	11	6
8.	Percentage of disclosures that were classified as meeting one of the identified purposes.	100	100

\* Percentages are obtained from Barth and Murphy study (1994).

The results are similar. However, the results cannot be strictly compared because categories were modified for my study. Also, my study included examining actual annual reports and therefore actual financial disclosures. The Barth and Murphy 1994 study did not include the examination of actual annual reports. For example for purpose 4, provide information that allows financial statement users to compare numbers to other companies, the percentage (31%) is higher for the US than HK. However, most of the difference is due to the disclosures related to other postretirement employee benefit information. In Hong Kong, other postretirement pension information is not provided. Because over 80% of the disclosures disaggregate recognized or unrecognized amounts, research that examines the situations that such disclosures could potentially be informative might lead to more efficient disclosure requirements.

A comparison of the three most common general disclosure topics for my study and the Barth and Murphy US study is presented in Table 8.

<b>Table 8: Comparison of HK and US</b>		
Most Common Disclosures By Categories Three Most Common Categories		
Purpose	HK	US*
1a	Earnings Per Share, Profit Attributable to Shareholders and Share Capital	Stockholders Equity, Debt and Taxes
1b	Dividends, Fixed Assets and Taxation	Taxes, Leases and Statement of Cash Flows
2a	Comparative Figures, Capital Commitments Approval of Financial Statements	Commitments, Taxes and Stockholders' Equity
2b	Directors Emoluments, Contingent Liabilities and Leases	Taxes, Leases and EPS
3a	Retirement Benefits Scheme, Investment and Contingent Liabilities	Pension, Other Postretirement Employee Benefits and Contingent Liabilities
3b	Contingent Liabilities, Interest in Subsidiaries and Investments	Contingencies, Stockholders' Equity and Other Postretirement Benefits
4	Dividends, EPS and Accounting Policies	Accounting Policies, Investments Other Than Mkt Securities
5	Deferred Taxation, Contingent Liabilities and Leases	Leases, Contingencies and Debt
6	Dividends, EPS and Profit Attributable to Shareholders	EPS, Stockholders' Equity and Employee Stock Option Plans
* Information obtained from Barth and Murphy 1994 study.		

Again, a strict comparison is not possible, but some conclusions can be reached. Even though some different categories were used, there were some common results. For example, leases were one of the three most common disclosures for purpose 2b and 5 for both studies. Earnings per share was one of the three for purpose 6 in both studies. Other disclosures for the same topic met the same purpose for both studies, but were not one of the three most common (see Table 8).

The purposes were also modified in the Hong Kong study. There was a total of nine purposes including the subpurposes in my study. For the Barth and Murphy (1994) study, there were seventeen purposes. The six general purposes were the same for both studies, but the Barth and Murphy study broke the general purposes into finer subpurposes.

This study does not attempt to resolve many other issues related to financial statement disclosures. Corporate financial reporting disclosures will remain controversial in the Asia-Pacific

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area. Some changes may be needed in the future in Hong Kong and other areas. These issues will continue to be important to those interested in disclosure topics. It is hoped that this study has provided some helpful information about the status of corporate financial disclosures in Hong Kong and provides some insight as the direction future research should take.

This study is subject to several limitations. First, no attempt was made to identify all possible footnote disclosure purposes. However, all existing disclosures were classified into one of the identified purposes. These already identified purposes listed by the HKSA were used as the basis for this study. Therefore, this inductive approach relied on the existing identification of appropriate purposes. Issues such as the significance of recognition versus disclosure alternatives were ignored. Other possible limitations include the difficulty in the consistent classification of observed disclosure items. Attempts were made to minimize this problem. Classifications were checked at a later time to gain some additional confidence that the evaluations were consistent.

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# DUTIES OF ACCOUNTING CLERKS DURING THE CIVIL WAR AND THEIR INFLUENCE ON CURRENT ACCOUNTING PRACTICES

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## ABSTRACT

*No single event in United States history has had such a profound impact on our country as the Civil War of 1861 to 1865. An analysis of military accounting documents of the period provides valuable information related to their influence on current accounting and auditing practices. These documents illustrate U.S. Army recordkeeping requirements and also reveal various internal controls utilized during this period. The goals of safeguarding assets and producing accurate accounting reports were critical to the military during these desperate times.*

*This paper begins with an overview of military organization. The purpose is to discuss and explain the hierarchical structure of the U.S. Army. The next portion of this document continues with reviews of the positions of company accounting clerks and quartermasters. Both of these assignments required responsible, conscientious soldiers who could be depended upon to prepare numerous reports. A significant number of internal controls were employed in an effort to properly account for the two major classes of assets, men and materials. Military regulations specified in detail the accounting and auditing tasks required when a particular report or statement was prepared. A number of actual Civil War accounting reports are reviewed in this paper with copies included in the appendix. The paper concludes with a review of accounting practices and internal controls that were instituted during the Civil War and continue to influence current accounting procedures.*

## INTRODUCTION

Civil War history is alive and well today for many Americans who visit popular battlefields and study famous generals. However, forgotten heroes of the war certainly include the dedicated accounting clerks and quartermasters who prepared a wide variety of required statements and reports in very dangerous conditions. These soldiers attempted to maintain adequate internal controls during this very difficult period. For example, U.S. Army Regulations stress the separation of the duties of

authorization, custody, and record keeping. Also, the use of multiple copies of documents in order to create an adequate "audit trail" was evident. The report forms were preprinted in an effort to minimize input errors and aid in their proper completion. Finally, Army regulations and associated texts such as *The Accounting Clerk* by August V. Kautz provided accounting clerks and quartermasters with sufficient and adequate documentation to ensure accurately prepared statements. This paper reviews the accounting and auditing activities of the dedicated accounting clerks and quartermasters who, in the midst of all of the strife, maintained the required documents in an effort to provide financial order. Company accounting clerks, quartermasters, assistant quartermasters and other accounting personnel were required to prepare a large number of documents on a daily, weekly, and monthly basis. Their dedication to this important task allowed the Army to effectively function with accurate and timely accounting paper of many types.

Accounting paper included invoices, monthly and quarterly reports, inventory schedules, and numerous other documents that were required by the Federal government in an effort to maintain accurate records related to physical assets and human resources (often simply termed men and materials). The appendix of this paper includes a number of examples of such documents. In particular, the reports typically prepared by a company accounting clerk will be examined.

Record keeping for both the Union and the Confederacy was an enormous task. The Union Army enlisted approximately 2.8 million men during the period from 1861 to 1865 (Bradley, 1990). The Confederacy enlisted somewhere between 600,000 and one million soldiers. Many historians believe that 750,000 is a logical estimate (Ibid). Given these numbers, the amount of record keeping that had to be done was enormous. Many factors affected the volume of military reports. For example, each unit of the Union Army was required to prepare invoices and inventory reports on a regular basis. Also, each military unit hired additional men from the local community as laborers who were normally paid monthly creating additional recordkeeping. With 3,559 different units in the Union Army and at least 1,526 units in the Confederacy, the paper, quill pens, and ink were constantly in use (Davis, 1993).

Reports were required from each operational unit within the army. The Union Army, during the Civil War, was composed of units of infantry, cavalry, heavy artillery, engineers, light infantry, and artillery batteries. Each report in the appendix is related to a specific military unit such as the 22nd Maine or the 48th New York. Reports of wounded and dead were required on a regular basis from each unit. Also, inventory summaries from each camp had to be completed on at least a monthly basis. Certain arms and supplies were inventoried weekly or even daily. This included critical assets such as horses and wagons (means of transportation) and most clothing, camp, and garrison equipage. The sheer number of reports required by the army placed a significant strain on the accounting clerks in their effort to maintain adequate internal controls and an effective audit trail.

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## ORGANIZATIONAL STRUCTURE OF THE U.S. ARMY

To allow the reader a better understanding of the following accounting reports, a brief introduction to basic military organization is appropriate. The U. S. Army is organized into corps, divisions, brigades, regiments, and companies (Regulations, 1861). A corps is the largest form of military unit. It is made up of two or three divisions under the direction of a Major General (Union) or a Lieutenant General (Confederate). A division is composed of two or three brigades. Each division is led by a Major General or Senior Brigade General. A brigade is a military unit consisting of two to six regiments. Either a Brigadier General or a senior Colonel commands it. A regiment is typically composed of 800 to 1,000 men. The commanding officer of the regiment is normally a Colonel. When the Civil War began, a regiment was at full strength with 1,000 men. After the first two years of the war, many of the regiments contained less than 500 members. As new men joined the army, they were normally assigned to new regiments rather than being added to depleted units. Finally, a regiment can be broken down into the smallest military unit called a company. Infantry regiments were typically composed of ten companies (Regulations, 21). However, heavy artillery regiments often had twelve companies. Each company was assigned a letter in alphabetic order (i.e. Company A, B, C). However, the letter "J" was never used in the process of assigning company alphabetical titles. The company became the basic unit of recordkeeping activities for the Army necessitating the selection of a company accounting clerk for each. Internal controls were employed at the company level in an effort to safeguard both human and physical resources. Frequent inventories of men (multiple daily roll calls), horses, wagons, arms, and all other equipment provided some assurance that the army's assets were safeguarded.

In the Union Army, a company was at full maximum strength with 98 enlisted men and three officers for an infantry company, 100 enlisted men and three officers for a cavalry unit, and 147 enlisted men and three officers for a battery of artillery (Kautz, Clerk, 1865). The minimum strength of a new company was 83 total members. Each infantry company was allowed to recruit between 64 and 82 privates. The remainder of the company was comprised of men from all of the other ranks. A company normally included one captain, one first lieutenant, one second lieutenant, one first sergeant, four sergeants, eight corporals, two musicians, and one wagoner (Ibid). Early in the war, its members elected the officers of the company. This practice was later replaced in 1862 by a system of examinations in an effort to eliminate incompetent officers who were elected to the position by friends. The company was often broken into four smaller groups that were called squads for tasks such as target practice and guard duty (Regulations, 21). However, accounting records and related internal controls related to the entire company.

The rank of each soldier was very important. Each report was normally prepared by a person of lower rank and authorized and approved by a superior. The military used the following ranking system from lowest to highest: private, corporal, sergeant, second lieutenant, first lieutenant, captain, major, lieutenant colonel, colonel, brigadier general, major general, lieutenant general, general.

Quartermasters, with a rank of either first or second lieutenant, prepared many of the summary accounting reports. Quartermasters and Assistant Quartermasters were normally appointed for each regiment (i.e. 10 to 12 companies). However, accounting transactions originated at the company level. Accounting clerk reports represented the "subsidiary ledger" figures that were summarized to determine totals for the regiment. Quartermasters provided the "custody" function by safeguarding numerous types of equipment, armaments, and clothing prior to being issued to a military unit or soldier.

### **THE COMPANY ACCOUNTING CLERK**

The U.S. Army demanded that its accounting statements and reports be accurate, timely, and relevant to decision making. This is similar to business firms today who must follow GAAP to accomplish this task. Record keeping in the U.S. Army began at the most basic level with the company clerk. The company or accounting clerk was a position filled by a man who was either a non-commissioned officer or soldier who was known to have good penmanship and a capacity for keeping good reports and records. This basically meant that privates (soldiers), corporals, or sergeants (non-commissioned officers) were allowed to hold the position of company clerk. This position is similar today to a bookkeeper's work in any small organization. The relevant tasks involve the recording, summarizing, and classifying of all financial events for the entity.

The clerk was normally supervised by either the commanding officer of the company (i.e. captain) or the first sergeant. The company accounting clerk's position was one that experienced a fairly high rate of turnover. Accounting clerks were replaced for reasons such as having very poor penmanship skills, being lazy and tardy in report preparation (timeliness), or having difficulty in locating documents and reports for review by company officers.

Company accounting clerks were "experienced penmen selected from the companies to assist the first sergeants in the making out their returns, reports, muster-rolls and other documents" (Kautz, Customs, 1865). Normally, one clerk per company was sufficient to accomplish the reporting requirements of the position. The clerk was often freed from tasks such as guard and kitchen duty due to his responsibility for the preparation of numerous daily reports and statements. However, he did not receive any additional pay for the extensive work required.

### **ACCOUNTING RECORDS MAINTAINED**

The clerk was required to maintain current records in nine separate books. The Morning Report Book, Sick Book, Rosters, Descriptive Book, Clothing Book, Order Book, Account Book of Company Fund, Register of Articles Issued to Soldiers, and Record Book of Target Practice were

all the responsibility of the company clerk (Kautz, Clerk, 1865). Indeed, this position was a seven-day, never ending job requiring excellent planning and organizational skills.



QUARTERMASTER'S CAMP -  
DURING THE CIVIL WAR,  
LIBRARY OF CONGRESS PHOTO

The Morning Report Book was prepared and sent to the regimental adjutant's office after sick call but before 8 am daily. The book contained the duty status of each soldier in the company. It included a "Remarks" column that described the reason for every officer or soldier not being available for duty. This document also described the situation of any soldier on "special or extra duty." Extra duty was a situation where soldiers were assigned to some continuous labor, in addition to their normal duties, for a period of ten days or longer (Kautz, Customs, 1865). The most typical situations included employment in the Quartermaster's department as mechanics, laborers, or teamsters. Soldiers received additional pay for this extra duty work until the practice was discontinued by the Act of March 3, 1863. Special duty related to the soldier being employed on duties that were not strictly military including serving as mechanics, general laborers, cooks, attendants in hospitals, clerks, officers' servants, pioneers, scouts, or spies (Kautz, Customs, 1865). The Morning Report Book, in addition to listing the men available for duty, also listed any soldier who was under arrest, away with or without leave, killed in action, wounded, hospitalized, or sick. The Regimental Surgeon had sole responsibility of excusing soldiers from duty due to illness. The Captain and other officers commanding the company had no such authority. The company's officers did have the power to excuse men from duty when they were assigned to jobs including the company clerk, company tailor, or company blacksmith (Kautz, Clerk, 1865). The Morning Report Book

required the clerk to review the status of each man in the company in an effort to determine the number of soldiers available for duty each day.

The Sick Book was updated every morning reporting the names of all ill soldiers. It included a statement by the surgeon as to whether they were excused from active duty or available for duty. "For duty" meant that the man was fit and able to perform all of the typical duties of a soldier including guard duty, drills, parades, and detached service (Kautz, Clerk, 1865). Detached service was a situation where soldiers were sent away from their companies to perform duties at another post, camp, or garrison (Kautz, Customs, 1865). The Sick Book also described situations where soldiers were only partially incapacitated and could perform some duties but were excused from others such as riding horses or guard duty.

The Roster Book was prepared using one page per month. It shows the names of each man in the company down the left of the page and each day of the month running across the top from left to right. This book recorded three classes of duty including guard, detachments, and fatigue. Normally, a separate Roster was maintained for each duty class (Kautz, Clerk, 1865). Fatigue was a term applied to all duties not strictly military which included laboring making roads, foraging for supplies and materials, and working on improving the grounds near a camp or post (Kautz, Customs, 1865).

The Descriptive Book listed each non-commissioned officer and enlisted man of the company with numerous details pertaining to each man (Kautz, Clerk, 1865). For example, the book included age, height, complexion, eye and hair color, birthplace, occupation, and when, where, and for how long they enlisted. In addition, other information including character, promotions, appointments, compliments, and medals earned was listed. Negative aspects of the soldier including punishments resulting from court-martials were also included. This book was intended to list "every important item to the credit or discredit of a soldier, to enable officers succeeding to the company to have a correct history of the men" (Ibid.).

The company Clothing Book was prepared by the clerk in an effort to maintain records of clothing issued to each non-commissioned officer and private (Kautz, Clerk, 1865). Army Regulations clearly state the amount of clothing allowance for each soldier on a yearly basis. For example, a private in the infantry received a clothing allowance of \$52.03 the first year, \$30.12 the second, \$42.96 the third, \$30.12 the fourth, and \$39.62 for the fifth year of enlistment (Kautz, Clerk, 1865). This allowance represented a total of \$194.85 for a private who served for five years. The Clothing Book was intended to accurately record all clothing requested by a soldier with a resulting figure for either clothing allowance still owed to the soldier or "over-issues" which resulted in a debt to the army. These "extra issues" were payable by the soldier at the payroll musters which were conducted every two months (Kautz, Clerk, 1865). The Muster Roll (payroll report) showed the deduction from the soldier's pay as a special memorandum entry.

Clerks had to show either "due the soldier for clothing not drawn" or "due the U.S. for clothing overdrawn" for each member of the company. The army was very concerned about the

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safeguarding of its assets, which included all the various forms of clothing issued to the men. One page of the Clothing Book was dedicated to a single soldier. The army normally provided the men with their entire first year's clothing allowance upon enlistment. In following years, the clerk used a monthly allowance to determine if an overdrawn or underdrawn situation existed. Clothing recordkeeping alone required a substantial amount of the clerk's time.

The army also attempted to safeguard clothing by carefully reviewing any soldier developing a disability soon after enlistment. If the problem was legitimate, the soldier was allowed to leave the army and keep the clothing with no deduction from their final paycheck (Kautz, Company, 1865). However, if the man was found to be of "unworthy character" and attempting to defraud the army, the full clothing allowance was withheld from his final paycheck. Therefore, an early "code of ethics" was utilized by the military in an effort to reduce fraudulent asset losses. Ethical behavior was as important during the Civil War as it is today.

Another problem facing the company clerk related to soldiers who were "careless and improvident" and sold their clothing to raise extra money. This occurred in areas of the country where clothing was much in demand (Kautz, Clerk, 1865). At times, clerks requested soldiers to produce their clothing for inspection or account for its absence prior to the issuance of additional items. The Act of January 11, 1812 prohibited the purchase of military clothing by any person not serving in active duty. The punishment included a penalty of three hundred dollars and one year's imprisonment (Ibid.). This, however, did not eliminate the black market in military clothing. Penalties for the soldier, under the 38th Article of War, also applied if they were found guilty of selling clothing or not properly caring for every asset entrusted to them.

The Order Book maintained by the clerk included all general orders from the regimental headquarters (Ibid.). This document also included any special orders that pertained to the company in general or to a particular member of the unit. For example, any soldier taken from the company for special duty elsewhere would appear in the Order Book. This book was organized either chronologically based on the date of the orders or by the type of order.

The Company Fund Account Book was a cash fund utilized by the unit for the purchase of necessities that were not furnished by the army (Kautz, Clerk, 1865). It basically took the form of a sources and uses of cash statement. On the left side, the sources of company funds were recorded. This "debit side" normally began with the fund's beginning balance and listed the sources of cash including amounts received from either the regiment or company savings account. The company fund also increased with the sale of unused company rations, allocations of post or regimental funds, and the sale of surplus vegetables raised in a company garden when stationed in a single location. The right or "credit side" of the Company Fund listed all the uses of cash such as the purchase of spices for cooking.

The Return of Company Fund was prepared every four months and reconciled the amount of cash that should have existed at the end of each accounting period. It was prepared by the company clerk and signed and approved by the commanding officer. This was typical for army

internal control requirements as reports were prepared by a clerk (recordkeeping) and approved (authorization) by a commanding officer. The report was completed in duplicate so that one copy remained with the company and the other was sent to regimental commanders. At the regimental level, all reports of the companies were summarized and reviewed for accuracy.

The Register of Public Property Issued to Soldiers was another book prepared by the accounting clerk (Kautz, Clerk, 1865). Its purpose was to record all of the rifles, pistols, swords, and other arms issued to each man. These assets were carefully assigned to each soldier in an effort to safeguard critical resources. The book also contained information on the issuance of cap-boxes, cartridge-boxes, gun slings, waist belts, and small tools used to maintain the weapons. Soldiers were normally charged for lost arms unless there was a very legitimate reason. Also, any stolen weapon was charged to the soldier unless he could show that he took adequate steps to safeguard it. Following a military engagement, the officers of the company were required to inventory arms in the hands of surviving soldiers and collect weapons from soldiers who were either killed or wounded (Kautz, Clerk, 1865).

The final book maintained by the company accounting clerk is the Record Book of Target Practice. This book, furnished by the Regimental Quartermaster, was used for recording the rifle shooting abilities of each man in the company (Kautz, Clerk, 1865). Each man fired four rounds at distances from 150 to 400 yards. Soldiers with the best accuracy received a company prize, which was a brass medal indicating sharpshooter abilities. This book had to be forwarded to the commanding officer of the regiment weekly.

These nine books required a tremendous amount of the clerk's time. However, this was not the full extent of the tasks required of him. In addition, the preparation of a large number of reports, returns, rolls, and papers was mandatory. The clerk also had to comply with the requirement for multiple copies of each report in order to complete an "audit trail" to Washington. Internal control was an important concern even though the duplicate copies of reports and statements had to be manually prepared lacking the luxury of carbon paper.

#### **ADDITIONAL REPORTS PREPARED BY THE ACCOUNTING CLERK**

The company accounting clerk was also responsible for the preparation of the following documents in addition to the books discussed above.

This list provides insight into the extent of work required from each accounting clerk. Every day a significant number of reports were required with especially heavy workloads occurring at the end of each calendar month and quarter. Muster Rolls were normally prepared every two months in an effort to pay the soldiers on a regular basis. In actual practice, however, the men were often not paid for a period of three to six months. Many of the muster rolls reviewed by the authors showed payment for services of three or more months. This often resulted from the unit's involvement in active engagements that limited the ability of paymasters to complete their duties.

The accounting clerk even had to complete records related to the company laundresses. Four women were allowed to serve each company as washerwomen (Regulations, 24). The Army's Council of Administration prescribed the price for washing all items of soldier's clothing. The clerk maintained a record of debts owed to each laundress as they completed their weekly washing duties. The washerwomen were compensated at the pay-table on a bi-monthly basis when a muster roll was conducted. Therefore, accounts receivable records were constantly updated over the two-month period to ensure that these women received adequate compensation.

<b>Required Reports, Returns, Rolls, And Papers:</b>	
1. Daily-	List of Sick (Sick Book) Morning Report (Morning Report Book) Details of Men (For Guards, Detachments, et.)
2. Monthly-	Monthly Return (Summary of Men and Equipment)
3. Bi-Monthly-	(Due end of Feb, April, June, Aug, Oct, Dec) Muster Rolls (Payroll reports)
4. Quarterly-	(Due end of March, June, Sept, Dec) Return of Clothing, Camp And Garrison Equipage Return of Ordnance And Ordnance Stores (Including All Weapons, Ammunition, Supplies, et.) Return of Quartermaster's Property Return of Deceased Soldiers Descriptive List of Men Joined Return of Blanks
5. Annually-	Annual Return of Casualties

Finally, the clerk was responsible for the preparation of the following papers related to numerous unique situations. They were prepared on an "as needed" basis as the event occurred. Special papers included:

1.	Certificates of Disability
2.	Discharges
3.	Final Statements (Final payroll)
4.	Furloughs, Passes, Sick Furloughs, etc.
5.	Inventories of Deceased Soldiers
6.	Requisitions for Forage, Fuel, Stationery, Straw, and for every kind of property such as Arms, Ammunition, Clothing, Camp and Garrison Equipage, Quartermaster's property, and nearly everything needed by a Company.

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7.	Inventory of Damaged Property
8.	Returns of Killed, Wounded, and Missing in Action
9.	Reports of Target Practice

All of the books and reports maintained by the U.S. Army relate to the objectives of gathering financial data in two key resource areas, men and property (materials) (Kautz, Clerk, 1865). Human resources and physical assets required a proper accounting on a regular basis. The reports related to men were meant to keep a record of "their account and their service." A soldier's account pertained to the amount of money owed to him by the Army or any balance he owed to the government. Regulations continually emphasized the importance of maintaining the full set of required financial reports, statements, and records. According to army regulations, the military wanted the accounts to be "correct and perfect as a matter of justice to the men and to the government" (Ibid.). A similar philosophy related to the reports that pertained to all types of tangible property. The internal control objectives of maintaining accurate accounting information and safeguarding all assets were critical to the U.S. Army.

During the Civil War, the Federal Government was also very interested in maintaining an audit trail. There were a number of Circulars from Washington that emphasized the use of three copies of each report. Two copies were used at the company and regimental levels. The third copy of each report, prepared and authorized by the ranking officer(s) of the unit, was supposed to be sent to Washington. Based on the author's research, Washington had difficulty accomplishing this goal. It reminded each military unit numerous times during the war that this three-copy policy must be followed in order to maintain an efficient audit trail.

### **BASIC RECORDKEEPING PRINCIPLES REQUIRED BY THE U.S. ARMY**

U.S. Army Regulations directed clerks to follow five basic recordkeeping principles (Kautz, Clerk, 1865). First, they were required to complete invoices for all property they received from other military units. Second, clerks were required to take receipts for all military property transferred to other companies or regiments. The third principle required them to get certificates for property lost or destroyed. These certificates were to be acquired from officers, if possible, or from soldiers or the clerk himself as a last resort. This was a common situation following an engagement as many items of equipment and arms were either lost or destroyed. The fourth recordkeeping principle required the clerks to make every attempt to not mix property of different departments. This included Ordinance, Quartermaster's property, and Clothing, Camp and Garrison Equipage, as each of these departments required its own style of report. The fifth and final general principle required them to not allow unserviceable property to accumulate. The clerk was to present the items to a company

or regimental inspection officer who would order their disposal. These principles were utilized in an effort to safeguard all strategic assets (men and materials).

## **A REVIEW OF AUTHENTIC CIVIL WAR REPORTS**

This paper continues with a review of several accounting documents. Some of them appeared in the U.S. Army Regulations of 1863. The Regulations provided examples of the proper format for completed reports as an aid to clerks, quartermasters, and officers involved in their preparation and authorization. This is similar today to firms that produce an accounting manual in an effort to train employees related to proper accounting practices and procedures. Other statements found in the appendix represent actual Union Army documents collected by the authors during the last ten years.

### **Report 1 - The Sick Book**

The first report in the appendix is the company sick book. This is a human resource document that was required to be updated every morning by each company. Notice that this form (Report 1) was a very simple yet important report. Human resources were a critical asset for the Army and this book was used as an "audit trail" to review cases where soldiers were chronically ill and missed a significant amount of active duty time.

The document was completed in order to determine which soldiers in the company were "fit for duty." This book contained the names of every member of the company that was not fully available for active duty that day. The process began each morning when a non-commissioned officer marched any "sick" men to visit the surgeon. The surgeon then determined who was fit for duty and recorded his decisions in the book, which was then returned to the first sergeant who, with the aid of the company clerk, completed a morning report showing the strength of the company. Someone who was "fit for duty" was expected to perform any legitimate task expected of a soldier. The surgeon was required to be very specific related to limited service expected from a member of the company. Notice on the example form that some men were excused from riding or guard duty but were well enough to perform other normal activities.

### **Report 2 - Statement of Cost of Clothing, Camp, and Garrison Equipage**

Report 2 in the appendix is the reference guide (General Orders, War Department, 1865) used in the determination of whether a soldier was over or under spent in his annual clothing allowance. Records were kept in the Company Clothing Book to determine if issues of clothing to non-commissioned officers (sergeants and corporals) and privates were more or less than their annual allowance. The form in the appendix was used by the company accounting clerk to determine

the cost of each item of clothing. For example, hats cost about \$1.65, coats were \$5.30-\$7.30, and trousers cost \$2.50-\$3.75. When a soldier was issued clothing, his account was charged for the cost listed in this table reducing his available clothing allowance for the year. A detailed standard cost system was utilized by the army for any item of clothing.

The regular (drafted) military received an annual clothing allowance as shown on the second page of Report 2. For example, a corporal in the cavalry received a clothing allowance of \$55.38 in his first year of service. This dropped to only \$31.07 in the second year. The total clothing allowance for a five-year enlistment in the army was approximately \$200.00. In the year of enlistment, the soldiers were provided with their full clothing allowance while in later years the apparel was requested by the men on an "as needed" basis.

Volunteers accounted for approximately 80% of the total membership of the army. The troops who were volunteers (vs. drafted military) received a monthly clothing allowance. This figure was fixed by law at \$3.50 per month or \$42.00 per year (Kautz, Quartermaster's, 1865). Each soldier's account was calculated by comparing the clothing drawn to date with the appropriate clothing allowance based on time served. When the soldier left military service, his personal account showed either "due the U.S. for clothing overdrawn" or "due the soldier for clothing not drawn." In the final statement, the calculation of the net amount due the soldier was determined. Therefore, the final military payroll received by a soldier was adjusted either up or down based upon an over or under spent clothing allowance. The final payment also normally included some travel expense money to aid the soldier in returning home.

### **Report 3 - The Company Fund Book**

Report 3 in the appendix is an example of the Company Fund Book. This form is basically a cash receipts and disbursements journal. Its basic sections are sources of cash, disbursements of cash, and balance carried to the next statement. In this example form, \$480 of cash was received, \$156 was expended, and the ending cash balance of \$324 was carried forward to the next statement period.

This cash account was for the "benefit of the enlisted men only". Every two months or less, if necessary, the company commander (i.e. Captain) gathered with other officers and determined the expenses that would be paid from this fund. The fund was supposed to be used for the payment of "necessaries that are not furnished by the army" (Kautz, Clerk, 1865, 25). This could include a great many things such as condiments for cooking, vegetables for the messes, tools for the mechanics, stencil plates for marking names in clothing, books for a company library, and other items necessary for the "comfort, health, and convenience of the enlisted men of the company" (Ibid). This could also include expenditures for items such as furniture, small games and cards, and even some tobacco products.

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Cash was transferred to the fund from a number of sources. For example, the fund was often reimbursed with cash from sales of crops raised by the company when stationed in a single location for several months. Cash was also received from both company and regiment saving accounts that were usually either deposited in a nearby bank or kept in an iron safe.

This statement was prepared whenever a new officer assumed command. Cash shortages often became evident at this time. However, military transfers were often quick and covered long distances. This meant that both the missing cash and the person responsible were never located or identified. The army required that most company and regimental assets be inventoried with a change in command. The idea was to quickly identify any missing assets as well as the person responsible for the loss.

#### **Report 4 - Tabular List of Rolls, Returns, and Reports (Partial List)**

Report 4 in the appendix is a partial list of the reports prepared by the Company Accounting Clerk. Found in the U.S. Army Regulations, this document shows the clerk what statements to prepare on which date. Since the position of the clerk was often short term, a good set of documentation was required in order to aid in the process of understanding the full set of required reports and statements. Adequate documentation continues to be an important internal control today in an effort to produce accurately prepared financial reports. Notice that certain situations required the immediate preparation of a report. This was true in the case of the death of a soldier. The company commander expected the clerk to provide Final Statements of Deceased Soldiers as soon as possible. This involved an inventory of the dead soldier's belongings so the items could be put into a safe place for later delivery to family members. Timeliness was critical due to the fact that cash and other valuables quickly disappeared.

This page in the regulations summarized the "Generally Accepted Military Document Practices" for the accounting clerk. Army regulations presented the expected format of a typical report as well as details of where and when the report was to be distributed. The army imposed input, processing, and output controls on every report preparer. From a review of this report, it is apparent that the clerks were especially busy at the end of each month and each quarter. Finally, the number of required daily reports was significant with some due prior to 8 am. It appears that "paperwork overload" existed at this early date in our history given the army's desire to operate an efficient and effective accounting system.

#### **Report 5 - Circular-Quartermaster General's Office**

Circulars were issued from U.S. Army headquarters in Washington and sent to all field officers. These documents pertained to a wide variety of subjects. However, this circular (Report 5) was strictly accounting oriented. It related to the transfer and requisitioning of clothing, camp,

and garrison equipage. The original date of General Orders, No. 357, was on November 5, 1863. Notice that the order required invoices to be prepared in triplicate rather than duplicate. The date of the reminder Circular was January 20, 1865. Evidently many units of the U.S. Army were not preparing invoices in triplicate as required by the original Washington order. This notice was used to call attention to a document issued fourteen months earlier.

The circular also brought attention to the fact that each unit should be identified on the invoice by regiment, brigade, division, corps, and name of state. Since so many different military units existed in the army, the audit trail for invoices and reports was extremely complex. The Quartermaster General's Office was attempting to improve this audit trail in an effort to safeguard all assets. The circular states that all this information was needed "to establish the identity of the Officers receiving the supplies, and to perfect the record of the transfers".

### **Report 6 - Requisition of Hay for Soldier's Bedding**

This final report (Appendix Report 6) brings to the reader's attention the crude conditions that the soldiers endured during this difficult period in our history. This document represents a requisition for straw to be used as bedding in the U.S. General Hospital located at Hilton Head, South Carolina on March 7, 1862. The report shows that each soldier was allowed twelve pounds of straw or hay per month to be used as bedding. Soldiers in the lower ranks had no cots or other types of beds. The document states that the bedding was needed for, "non-commissioned officers, musicians, and privates." In most cases, the officers had some type of cot or folding bed that was used in their sleeping quarters. This requisition includes 12 pounds of hay for each of the 45 soldiers involved for a grand total of 540 pounds of hay. Since straw was not available, the men were forced to sleep on hay that would have been very uncomfortable.

J.E. Sample who was an assistant surgeon for the Union Army prepared the report. The bottom of the report shows not only Sample's signature but also that of Col. Fellows and George E. Cooper, a surgeon, who approved the requisition. The last statement on the document shows that Capt. H.A. Hascall who was quartermaster at that time provided the 540 pounds of hay. The certification in the lower middle of the document states that, "straw (or hay) has not been drawn for any part the time charged." This was to ensure that double rations were not requested. Each military report contained language where the preparer certifies that the information on the report was true and accurate. This form represents another good example of the Army's attempt to separate the activities of authorization, custody, and record keeping in an effort to maintain a respectable level of internal control.

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## INFLUENCES ON CURRENT ACCOUNTING AND INTERNAL CONTROL PRACTICES

A review of historic accounting documents provides insight into the development of current accounting practices and internal control procedures. The reports and associated internal controls utilized during the Civil War provided a framework that American businesses later replicated. Many of the officers from both Union and Confederate armies entered the business world following the war. They logically employed the accounting and internal control systems that were familiar to them. Most of these men were graduates of West Point who were perhaps the best-trained minds related to these subjects at this time. According to Hoskin and Macve (1988), a new form of "managerialism" emerged with these men. In particular, attention to financial details and a serious attempt to safeguard assets resulted from the emergence of these officers as top managers of major U.S. businesses.

The military employed many forms of internal controls during the Civil War that continue to be valuable today. In modern internal control systems, there are five primary procedures or activities that must be accomplished (Albrecht, 2003). These include segregation of duties, proper authorization policy, independent checks, physical safeguards, and adequate documents and records. Military regulations reflect the existence of each of these practices. For example, three different soldiers normally conducted the three incompatible duties of custody, authorization, and recordkeeping. The accounting clerk prepared the reports, an officer of the company or regiment signed the documents for authorization purposes, and quartermasters normally were given custody of the assets ranging from ammunition to all forms of clothing.

In addition to a system that segregated incompatible duties, the military accounting structure required that a higher-ranking officer authorize all transactions and reports. This situation exists today when business firms require proper authorization of all events by a superior. The use of independent checks also existed during the Civil War when officers conducted surprise audits of various assets and also prepared various reconciliations in an effort to safeguard all assets. The majority of business firms utilize this policy today when surprise cash counts or regular reconciliations of receivables and other assets are completed. Physical safeguards were also employed during the Civil War. The U.S. Army required most tangible assets to be under the control of a quartermaster who managed a locked inventory storeroom. The quartermasters provided limited access to items ranging from munitions to clothing in an effort to minimize losses. This policy is used by modern businesses as they use various security measures to limit the loss of inventory.

The final control procedure relates to adequate documents and records. U.S. Army military regulations contained hundreds of pages pertaining to the proper preparation of various statements. Required reports related to supplies, clothing, camp and garrison equipage, horses, fuel, forage, straw, bedding material, stationery, and numerous statements related to the activities and compensation of the men. Current accounting and internal control systems also consider this to be

critical. Modern auditing texts emphasize the importance of a firm that produces well-designed, easily understood reports and statements.

Modern accounting texts also emphasize that a good accounting system ensures that all financial transactions are valid, properly authorized, complete, properly classified, recorded in the proper period, properly valued, and summarized correctly (Albrecht, 2003). These characteristics also existed in the U.S. Army Regulations of 1863. They reflected the education provided to the officers at West Point and set a quality standard at the early date in our history. As mentioned earlier, these officers used this knowledge as they entered the business world following the conclusion of the war. Each of these army documents was designed to accomplish the objectives mentioned above. Each report was prepared with the goals of safeguarding assets and ensuring accurate accounting records in mind. This philosophy has continued today as firms strive to accomplish this difficult objective.

### CONCLUSION

This paper has attempted to provide the reader with some appreciation of the accounting and auditing tasks required of company accounting clerks in the Union Army during the Civil War. Internal controls and the maintenance of an audit trail were very important to the army as it attempted to safeguard all forms of assets ranging from numerous types of weapons and equipment to all items of personal clothing. Regular inventories of physical assets with an explanation of shortages and losses enhanced the internal control system.

Many of the army's controls are evident following a review of the documents contained in the appendix. The separation of recordkeeping, authorization, and custodial duties is obvious, since officers were required to approve all reports prepared by the clerks. Frequent, detailed reports of men and materials were necessary in order to maintain current inventory information. Multiple copies of the company's documents were required to update regimental and Washington headquarters records as well as maintain an accurate audit trail. This certainly continues to be an important objective today as firms attempt to be able to trace all transactions from the source documents to the related report or statement.

U.S. Army Regulations served to provide adequate documentation to clerks and quartermasters in their effort to maintain accurate financial records. Sufficient documentation is a key control feature for any accounting system, since it assists in clerical training and the reduction of input errors. Current goals of internal control continue to include the safeguarding of assets and the preparation of accurate accounting documents. The Union Army attempted to accomplish these objectives at a time when no technology existed. Clerks, armed with only quill pen and ink, attempted to establish a reasonable internal control system.

Accounting is considered by many to be an art. This art developed during the Civil War as officers who were West Point trained utilized their knowledge of accounting principles and related

internal controls. Following the war as U.S. businesses rapidly expanded, managers realized the importance of creating an effective and efficient accounting system. This continues to be a major goal of business organizations today. Without effective accounting practices and related internal controls, the firm will have little success accomplishing their goals of safeguarding assets and ensuring accurate and effective accounting reports.

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## APPENDICES

APPENDIX - REPORT 1

PAR. 16.

Form 1.

Company A, 1st U. S. Cavalry. Names. January 1, 1863.	In hospital.	In quarters.	For duty.	Excused.	REMARKS.
Sergeant, Smith, J. H.....	1	.....	.....	1	
Corporal, Jones, B.....	.....	1	.....	1	Not permitted to leave quarters or camp.
Privates, Brown, H.....	.....	.....	1	.....	
Thomas .....	.....	.....	1	.....	Except riding and guard.
Jan. 2.					
Sergeant, Smith, J. H.....	.....	1	.....	1	Must remain in quarters.
Corporal, Jones, B.....	.....	.....	1	.....	
Privates, Brown, H.....	1	.....	.....	1	
Thomas .....	.....	.....	1	.....	Excused from riding.
Johnson.....	1	.....	.....	1	
Jan. 3.					

APPENDIX - REPORT 2

GENERAL ORDERS, No. 364, WASHINGTON, NOV. 12, 1868.

STATEMENT of the cost of Clothing, Camp and Garrison Equipage, for the Army of the United States, until further orders, with the allowance of Clothing to each soldier during enlistment, and his proportion for each year.

CLOTHING.	Engineer Troops.	Hospital Stewards.	Ordnance Sergeants.	Ordnance Mechanics.	Cavalry.	Light Artillery.	Artillery.	Infantry.	Invalid Corps.	Proportion for each year.					Allowance for five years.
										First.	Second.	Third.	Fourth.	Fifth.	
Uniform Hat.....	\$1 65	\$1 65	\$1 65	\$1 65	\$1 65	\$1 65	\$1 65	\$1 65		1	1	1	1	1	5
"    "    Feather.....	15	15	15	15	15	15	15			1	1	1	1	1	5
"    "    Cord and tassel.....	12	12	12	12	12	12	12			1	1	1	1	1	5
"    "    Eagle.....	2	2	2	2	2	2	2								
"    "    Castle.....	18														
"    "    Shell and flame.....			3	3											
"    "    Crossed sabres.....					2										
"    "    Crossed cannon.....						3									
"    "    Bugle.....							3								
"    "    Letter.....					1	1	1								
"    "    Number.....					1	1	1								
"    "    Cap (Light Artillery).....						1 00									
"    "    Tulip.....						75									
"    "    Cord and tassel.....						4									
"    "    Plate.....						4									
"    "    Rings, pairs of.....						8									
"    "    Hair plume.....						75									
Forage Cap.....	58	58	58	58	58	58	58	58	58	1	1	1	1	1	5
"    "    Cover.....	15	15	15	15	15	15	15	15	15						
Uniform Coat, Musicians'.....	7 80						7 80	7 80		2	1	2	1	2	8
"    "    Privates'.....	7 00	7 00	7 00	7 00			7 00	7 00		2	1	2	1	2	8
"    "    Jacket, Musicians'.....					5 75	5 75			4 55	2	1	2	1	2	8
"    "    Jacket, Privates'.....					5 80	5 80			4 25	2	1	2	1	2	8
Chevrons, pairs, N. C. S.....			1 25			1 25		1 25							
"    "    1st Sergeants'.....			30			30		30							
"    "    Sergeants'.....			20			20		20							
Chevrons, pairs, Corporals'.....	15				15	15	15	15	15						
Caduceus.....		85													
Shoulder Scales, pairs, N. O. S.....		50	50		50	50	50	50	50						
"    "    Sergeants'.....		50			50	50	50	50	50						
"    "    Privates'.....		50		50											
Trowsers, Sergeants'.....	2 70	2 70	2 70		3 75	3 75	2 70	2 70	2 70	3	2	3	2	3	13
"    "    Corporals'.....	2 70			2 50	3 75	3 75	2 70	2 70	2 70	3	2	3	2	3	13
"    "    Privates'.....	2 50				3 55	3 55	2 50	2 50	2 50	3	2	3	2	3	13
Sash.....	1 70	1 70	1 70		1 70	1 70	1 70	1 70	1 70						
Flannel Sack Coat (unlined).....	2 35	2 35	2 35	2 35	2 35	2 35	2 35	2 35	2 35						
"    "    (lined).....	3 12	3 12	3 12	3 12	3 12	3 12	3 12	3 12	3 12						
Knit Jackets.....	2 55	2 55	2 55	2 55	2 55	2 55	2 55	2 55	2 55						
Flannel Shirts.....	1 53	1 53	1 53	1 53	1 53	1 53	1 53	1 53	1 53	3	3	3	3	3	15
Knit.....	1 27	1 27	1 27	1 27	1 27	1 27	1 27	1 27	1 27						
Flannel Drawers.....	90	90	90	90	90	90	90	90	90	3	2	2	2	2	11
Knit.....	1 04	1 04	1 04	1 04	1 04	1 04	1 04	1 04	1 04						
Stockings.....	32	32	32	32	32	32	32	32	32						
Bootees, sewed.....	2 05	2 05	2 05	2 05	2 05	2 05	2 05	2 05	2 05	4	4	4	4	4	20
"    "    pegged.....	1 48	1 48	1 48	1 48	1 48	1 48	1 48	1 48	1 48						
Boots, sewed.....					3 35	3 35									
"    "    pegged.....					2 92	2 92									
Great Coats.....	7 50	7 50	7 50	7 50	8 75	8 75	7 50	7 50	7 50	1					1
"    "    Straps, pairs.....	11	11	11	11	8 25	8 25	11	11	11						
Blankets, woolen.....	3 25	3 25	3 25	3 25	3 25	3 25	3 25	3 25	3 25						
"    "    painted.....	1 27	1 27	1 27	1 27	1 27	1 27	1 27	1 27	1 27						
"    "    rubber.....	2 48	2 48	2 48	2 48			2 48	2 48	2 48						
Poncho, painted.....					1 70	1 70									
"    "    rubber.....					2 75	2 75									
Leather Stocks.....	9	9	9	9	9	9			9	9	1		1		2
Leggins, leather.....								1 20	1 20						
"    "    linen.....				1 24					68						
Overalls.....	1 24									1	1	1	1	1	5
Stable Frocks.....					1 30	1 30				1					2

Mounted men may, at their option, receive one pair of "boots" and two pairs of bootees, instead of four pairs of bootees. Metallic eagles, castles, shell and flame, crossed sabres, trumpets, crossed cannon, bugles, letters, numbers, tulips, plates, shoulder-scales, rings, the cap cord and tassels, the hair plume of the light artillery, the sashes, knapsacks and straps, haversacks, canteens, straps of all kinds, and the talmas, will not be issued to the soldiers, but will be borne on the return as company property while fit for service. They will be charged on the muster-rolls against the person in whose use they were when lost or destroyed by his fault.

## APPENDIX - REPORT 2 (Continued)

TABLE specifying the money value of Clothing allowed to the Army of the United States.

	NON-COM. STAFF.		CHIEF MUSICIANS.		FIRST SERGEANT.			SERGEANT.			
	Cavalry or Lt. Artillery.	or Artillery Infantry.	Cavalry or Lt. Artillery.	or Artillery Infantry.	Engineers.	Cavalry or Lt. Artillery.	or Artillery Infantry.	Engineers.	Ordnance.	Cavalry or Lt. Artillery.	or Artillery Infantry.
1st year...	\$57 58	\$55 13	\$58 48	\$55 73	\$54 47	\$55 68	\$53 23	\$54 27	\$55 13	\$55 48	\$53 03
2d year....	32 17	31 77	32 62	32 07	32 06	31 22	30 82	31 96	31 77	31 12	30 72
3d year....	47 11	46 06	48 01	46 66	45 40	45 21	44 16	45 20	46 06	45 01	43 96
4th year...	32 17	31 77	32 62	32 07	32 06	31 22	30 82	31 96	31 77	31 12	30 72
5th year...	42 47	42 72	43 37	43 32	42 06	40 57	40 82	41 86	42 72	40 37	40 62
	211 50	207 45	215 10	209 85	206 05	203 90	199 85	205 25	207 45	203 10	199 05

	HOSPITAL STEWARD.	CORPORAL.			MUSICIANS.			ARTIFICER AND PRIVATE.			
		Engineers.	Cavalry or Lt. Artillery.	or Artillery Infantry.	Engineers.	Cavalry or Lt. Artillery.	or Artillery Infantry.	Engineers.	Ordnance.	Cavalry or Lt. Artillery.	or Artillery Infantry.
1st year...	\$54 33	\$54 17	\$55 38	\$52 93	\$53 87	\$55 38	\$52 63	\$53 27	\$53 27	\$54 48	\$52 03
2d year....	31 37	31 91	31 07	30 67	31 66	30 97	30 42	31 36	31 36	30 52	30 12
3d year....	45 26	45 10	44 91	43 86	44 80	44 91	43 56	44 20	44 20	44 01	42 96
4th year...	31 37	31 91	31 07	30 67	31 66	30 97	30 42	31 36	31 36	30 52	30 12
5th year...	41 92	41 76	40 27	40 52	41 46	40 27	40 22	40 86	40 86	39 37	39 62
	204 25	204 85	202 70	148 65	203 45	202 50	197 25	201 05	201 05	198 90	194 85

The allowance to Volunteer troops is at the rate of \$42 per annum.



APPENDIX - REPORT 4

**TABULAR LIST OF ROLLS, RETURNS, AND REPORTS REQUIRED FROM COMPANY COMMANDERS.**

DESIGNATION.	WHEN TO BE MADE.	WHEN TO BE SENT.	BY WHOM.	PARAGRAPH OR REGULATIONS 1881.
<i>To Adjutant-General.</i>				
Master Roll of Company.....	Every two months.....	Within three days thereafter.....	Mustering Officer.....	333 and 334.
Inventory of Effects of Deceased Soldiers.....	Immediately.....	Do.....	Company Commander.....	152.
Final Statements of Deceased Soldiers.....	Do.....	Do.....	Do.....	152.
<i>To the Quartermaster-General.</i>				
Duplicate Returns of Clothing, Camp and Garrison Equipage, and Quartermaster's Property— one with and one without vouchers.....	End of every quarter.....	Within twenty days thereafter.....	Do.....	1189, 1171, and 1173
<i>To the Chief of Ordnance.</i>				
Returns of Ordnance and Ordnance Stores.....	End of every quarter.....	Within twenty days thereafter.....	Do.....	1471.
Certificate of Inventory on Return of Ordnance and Ordnance Stores.....	Yearly—in June.....	Do.....	Do.....	1425.
Report of Damaged Arms.....	End of every two months.....	First day of subsequent month.....	Do.....	1385.
<i>To Regimental Head-Quarters.</i>				
Descriptive List of Men Joining.....	End of every quarter.....	First day of subsequent month.....	Do.....	88 (4th clause).
Return of Deceased Soldiers.....	Do.....	Do.....	Do.....	463.
Return of the Company.....	End of every month.....	Do.....	Do.....	458.
Transcript of Orders making temporary appointments of Non-commissioned Officers, or reducing Non-commissioned Officers, at Posts not Regimental Head-Quarters.....	Immediately.....	Do.....	Do.....	74 and 79.
Inventory of Effects of Deceased Soldiers.....	Do.....	Do.....	Do.....	152.
Final Statements of Deceased Soldiers.....	Do.....	Do.....	Do.....	162.
Return of Blanks.....	End of every quarter.....	As soon as completed.....	Do.....	Gen. O., No. 13, 1892.
<i>To Post Adjutant.</i>				
Morning Report of Company.....	Each morning.....	Before eight o'clock A.M.....	Do.....	285.
Daily Return of Company (to be returned to Company Commander for file).....	End of every month.....	First of subsequent month.....	Do.....	458.
Return of Company Fund, with Company Council Book.....	End of every four months.....	Do.....	Do.....	206.

The same Returns as above are to be made by Officers commanding Bands or Company Officers, when on Regimental Recruiting Service, make to the Adjutant-General, or, in the absence of the Adjutant-General, to the Adjutant-General, or, in the absence of the Adjutant-General, to the Adjutant-General, or, in the absence of the Adjutant-General, to the Adjutant-General.

\* Three Muster and Pay Rolls are made out at the same time—two for the Paymaster and one to be retained with the Company. One Muster Roll is at the disposal of the Adjutant-General.

## APPENDIX - REPORT 5

[CIRCULAR.]

Quartermaster General's Office,  
 DIVISION OF CLOTHING AND EQUIPAGE.  
 Washington, D. C., Jan. 20, 1865.

The attention of all Officers transferring Clothing, Camp and Garrison Equipage, is hereby called to General Order, No. 357, War Department, Nov. 5, 1863, requiring in all cases duplicate invoices of transfers to be furnished direct to this Office, as soon as the transfer is made.

The Order reads as follows:

"All officers transferring Clothing or Camp and Garrison Equipage will make the Invoice thereof in triplicate, two copies of which will be delivered, or transmitted, to the officer to whom the transfer is made, and the third will be transmitted forthwith, by mail, to the Quartermaster General, at Washington, D. C."

"The only exception to this regulation is, where company commanders or other officers issue clothing directly to enlisted men."

Care will be taken to give in the invoice the full designation of the Companies and Regiments to which the Officers respectively belong, giving in each case the arm of service, number of Regiment, Brigade, Division, and Corps, and name of State; such information being necessary to establish the identity of the Officers receiving the supplies, and to perfect the record of the transfers.

By order Quartermaster General.

Alex. J. Perry  
 Col., U. S. Department

APPENDIX - REPORT 6

Requisition for Hay (for bedding) for U. S. General Hospital, Hilton Head, S. C., for the month of March 1862

Station	Non-Commiss. Agents, Officers, Privates	Total drawn for	Monthly Allowance to each	Total allowance	Remarks
			Pounds	Pounds	
Hilton Head S. C.	45	45	12s	540	There being no straw on hand, Hay is required for instead.
Total	45	45	12	540	

I certify that the above return is correct & just and that straw (or hay) has not been drawn for any part of the time charged.

Approved: By Order of *J. S. Sargent*  
*Col. V. D. Fellers* *Chief Surgeon*  
*Surgeon. U.S.A.* *W. H. Jones*  
*Quartermaster U.S.A.* *W. H. Jones* *Pro. Adjt. G.*

Received at the U. S. General Hospital, Hilton Head S. C., the \_\_\_\_\_ day of March 1862, <sup>540 pounds</sup> of hay, in full of the above requisition.

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## HERD BEHAVIOR AND MARKET STRESS: THE CASE OF MALAYSIA

**Ming-Ming Lai, Multimedia University**  
**Siok-Hwa Lau, Multimedia University**

### ABSTRACT

*This paper examines herd behavior under an extreme market stress environment of the Malaysian stock market which was badly hit in the Asian financial crisis. The cross-sectional standard deviation of returns, or dispersion, covering a period of ten years' monthly prices of all stocks from January 1992 to December 2001 are used to capture the presence of herd behavior. Interestingly, evidence of herding behavior of Malaysian market participants was prevalent in extreme lower market stress context and financial crisis (bearish) period. This result contradicts the findings of herd behavior as documented by Christie and Huang (1995). On the other hand, the results also revealed that Malaysian investors acted according to their own opinions during periods of upper market stress as indicated by positive coefficient and they did not let their investment decisions be influenced much by the collective actions of the market. Insightful and related financial events associated with market stress contexts are described.*

### INTRODUCTION

Herding exists everywhere, not only in the animal world but also human daily life; especially when making investment decision. Karguine (2003) believes that "experts tend to herd if they can communicate among themselves". As investors like to seek advise from these experts, they will then be influenced and led by the herding to similar directions. It is not surprising to know that word-of-mouth communication and contagion of ideas may sometimes happen rapidly. "A fundamental observation about human society is that people who communicate regularly with one another think similarly" (Shiller, 2000, p.148). Baruch (1958) described the stock market as follows:

*What registers in the stock market's fluctuations are not the events themselves but the human reactions to these events, how millions of individual men and women feel these happenings may affect the future. Above all else, in other words, the stock market is people.*

The 1997 Asian financial crisis which drew global attention and debate was partly due to the herd behavior of human beings (Jomo, 1998). Herding also occurred among newsletter analysts (Graham, 1999) and security analysts (Welch, 2000). Analysts and investors tend to be part of the herd and being in a herd can help them to share the blame for mistakes they make. However, there is little attempt on herd behavior within the contexts of bullish and financial crisis periods. Instigated by Malaysian stock market's uniqueness as well as its extreme experiences of market bullishness and financial crisis in the 1990s, it is interesting to examine the herding behavior in extreme up and down market movements, bullish, and financial crisis periods. This paper provides evidence to the current literature of herding behavior within various extreme market stress environments in an emerging stock market.

### **LITERATURE REVIEW**

Researchers have devoted considerable effort in examining the investment behavior of market participants. Previous evidences indicate herding is a common behavior in the capital market. Asch (1952) had conducted an experiment which indicated that people rationally took into account the information revealed by others' actions. These findings are further reinforced by Jost (1995) that the tendency for people in groups to think and behave similarly seemed to suggest some kind of irrationally, such as a loyalty induced psychological motivation to be in accord with group members. Thus, they tend to observe others before making their own decisions.

The survey conducted by Shiller and Pound (1989) indicated that herding behavior existed among institutional investors. They found that institutional investor put emphasis on the advice of other professionals in making their investment decisions in volatile stocks. Lakonishok, Shleifer, and Vishny (1992) examined the impact of institutional trading on stock prices. The results revealed only weak evidence of herding decisions by institutional investors among small capitalization stocks. However, no evidence of herding was found among large capitalization stocks.

Herding behavior was also discovered in both models of Banerjee (1992) and Bikhchandani, Hirshleifer, and Welch (1992). They affirmed that people acquired information in sequence by observing the actions of other individuals in their group who preceded them in the sequence. Banerjee (1992) illustrated that people would be doing what others were doing, even though their own information suggested doing something quite different. This made each person less responsive to their own information set and hence making them less informative to others. On the other hand, Tvede (1999) indicated that human beings would use the behaviors of others as a source of information about a subject.

Market practitioners claimed that the October 1987 Wall Street crash was caused by the panics produced by investor overreaction. The Dow Jones Industrial Average fell on 19th October 1987, Monday, by 23 percent to 1739 points in seven hours. Panic selling spilled over to other regions of the world. On the following morning, the crash was over with the positive opening of the

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world stock markets. Tvede (1999, p.134) said that "a strange mood spread through the stock market, everybody was asking one single question: What on earth happened?". Shiller's 1987 survey of the October 1987 crash revealed that investors were reacting to each other during these crashes, rather than responding to hard economic news (Shiller, 1987). Shiller (1995) observed that people who interacted with each other regularly tended to think and behave similarly.

Christie and Huang (1995) examined the presence of herd behavior in the United States stock market by using both daily and monthly data for NYSE and AMEX from July 1962 to December 1988. The monthly data for NYSE firms were from December 1925 to December 1988. They examined the presence of herd behavior under various market conditions. They pointed out that based on prediction of rational asset pricing models, larger changes in market return would result in an increase in stock return dispersions. This was because individual stock had its own differences and sensitivity to the market return. Hence, the dispersions would increase substantially during both extreme upper and lower market stress conditions. On the other hand, if the individual stock return herded around the market return and suppresses their own investment predictions and decisions, indicating the presence of herd behavior, the dispersions of equity returns would be predicted to be low. The results of the study are inconsistent with the prediction of herd behavior during periods of market stress.

Chang, Cheng and Khorana (2000) extended the work of Christie and Huang (1995). Chang et al. (2000) revealed evidence in favor of herd behavior in South Korea and Taiwan during both extreme upper and lower market stress contexts. However, in the case of the United States, Hong Kong and Japan during periods of extreme price movement, equity return dispersions actually tended to increase in a linear way rather than to decrease during periods of market stress. It is noted that the findings for the US are consistent with Christie and Huang (1995). The plausible explanation of the differences in return dispersion between the developed and emerging markets may partly be due to incomplete information disclosure in the emerging markets.

## **DATA AND METHOD**

We adapted the model developed by Christie and Huang (1995) in examining the presence of herd behavior among market participants in the Kuala Lumpur Stock Exchange (KLSE). The monthly prices of all stocks listed on the main board of the KLSE from January 1992 to December 2001 were employed and the raw data was obtained from Thomson Financial Datastream Database. We investigated the herding behavior of market participants by estimating the dispersion of equity returns in full-sample period, two sub-sample periods, bullish and bearish periods. J.L. Tan (1997) indicated that January 1993 to July 1993 was a "Bull-Run" period and August 1993 to December 1993 was a "Super Bull-Run" period for the KLSE. The degree of price momentum in the bullish period of 1993 was also recognized by the Geneva-based Morgan Stanley Capital International Perspective that appeared in the Singapore Business Times on 6th October 1993, as pointed out by

J.L. Tan (1997). The rankings indicated that nine of the best-performing stocks in the world in the first nine months of 1993 were Malaysian stocks. There were Idris Hydraulic, Technology Resources, Golden Plus Holdings, Landmarks, United Engineers, Metroplex, Innovest Berhad, Aokam Perdana, and Bedford. Not surprisingly, Malaysia emerged as the second best-performing bourse among 22 stock markets worldwide during that period. The period from mid-1997 to mid-1999 was considered as a period of financial crisis and economic downturn. Okposin and Cheng (2000) outlined the impact of financial crisis on the Malaysian economy. The Kuala Lumpur Stock Exchange Composite Index dropped by 75.65% to the level of 262.70 points over 1st July 1997 to 1st September 1998. From 1st September 1998, the Malaysian government introduced capital control measures to curb the financial crisis. The Malaysian Ringgit was no longer a legal tender outside Malaysia. The Malaysian Ringgit was pegged against the United States Dollar at the rate of US\$1.00 = RM3.80.

The monthly data was employed in consideration of the "herds repulse in longer time horizon to affect stock market prices. Hence, the use of daily data unfairly restricts the ability of herd behavior to manifest itself in dispersions during periods of market stress" (Christie and Huang, 1995, p35). By estimating equity return dispersions (S), the dispersion measure captures the key attribute of herd behavior. If returns tend to be very similar across stocks due to herding, it would produce low deviations and hence the dispersions would be low. If the asset pricing prediction is correct, the deviations would widen and dispersions would increase. The dispersion is also defined as cross-sectional standard deviation of returns. Dispersions indicate the average proximity of individual stock returns to the average return.

Equity Return Dispersions (S),

$$S = \sqrt{\frac{\sum_{i=1}^n (r_i - \bar{r})^2}{n - 1}} \quad (1)$$

Where

- $r_i$  = the observed return on firm i
- $\bar{r}$  = the cross-sectional average of the n returns in the portfolio
- $r$
- n = number of data in the sample

We then examined whether equity returns dispersions are significantly different than average during both periods of upper and lower extremes market movements or market stress by using the equation 2:

$$S_t = \alpha + \beta_1 D_t^L + \beta_2 D_t^U + \epsilon_t \quad (2)$$

Where

$D_t^L = 1$  if the market returns on month  $t$  lies in the extreme lower tail of the return distribution

$D_t^L = 0$  otherwise, and

$D_t^U = 1$  if the market returns on month  $t$  lies in the extreme upper tail of the return distribution

$D_t^U = 0$  otherwise,

$\alpha$  = the coefficient that denotes the average dispersion of the sample excluding the regions covered by the two dummy variables.

The equation 2 is estimated by using criterion to define extreme market movements. We examined the herding behavior in market stress through 1 and 5 percent criterion as indicated earlier. For example, the 5 percent criterion restricts  $D_t^L$  and  $D_t^U$  to 5 percent of the lower tail and 5 percent of the upper tail of the market returns distribution. The  $\beta_1$  coefficient on the indicator variables indicates how much the dispersion changes when the market return is in the bottom 5 percent of the market return distribution i.e. during market downturn. On the other hand, the  $\beta_2$  coefficient on the indicator variables indicates how much the dispersion changes when the market return is in the top 5 percent of the market return distribution i.e. during market upturn.

It should be pointed out that the rational asset pricing models however predict that dispersions will increase since there are significant variations in the stocks sensitivity to market movements (beta's). The rational asset pricing models expect significantly positive coefficients for  $\beta_1$  and  $\beta_2$ , while negative estimates of  $\beta_1$  and  $\beta_2$  would be consistent with the presence of herd behavior (Christie & Huang, 1995).

Identifying the ten largest positive and negative cross-sectoral monthly average returns and their associated dispersions extends this study. The identification would gauge insights of stock market conditions and its dispersions. Important financial events in the Malaysian financial markets are linked to the respective top largest positive and negative monthly returns.

## FINDINGS AND ANALYSIS

Table 1 shows the average return, its associated standard deviation, and the number of stocks in the entire sample (10-sectors) and by sector over a period of 10 years from January 1992 to December 2001.

<b>Table 1: Average Return and Standard Deviation of Dispersion Based on Sectoral Classifications from 1992 to 2001 in the KLSE</b>							
Sector	Period 1992 - 2001			1992 - 1996		1997-2001	
	Average Returns	Standard Deviation of Dispersion	Average Number of firms	Average Returns	Standard Deviation of Dispersion	Average Returns	Standard Deviation of Dispersion
Construction	-0.29	15.10	11	1.81	9.54	-2.34	18.92
Trading/Services	-0.06	12.88	52	1.88	9.50	-1.96	15.35
Hotels	-0.65	16.49	3	1.72	13.66	-2.98	18.68
Consumer Products	-0.05	10.64	33	1.32	8.80	-1.39	12.11
Finance	0.39	14.14	34	2.76	10.56	-1.94	16.71
Industrial Products	-0.29	12.00	47	1.52	8.88	-2.07	14.29
Mining	0.33	15.64	4	2.08	13.37	-1.39	17.54
Plantations	0.43	11.83	30	2.23	11.82	-1.33	11.66
Properties	-0.33	14.37	40	1.71	11.46	-2.34	16.60
Trust	-0.29	16.85	2	1.01	20.80	-1.58	11.80
All Sectors	-0.04	12.57	256	1.86	9.90	-1.91	14.58
Jan - Dec 1993			July 97- June 99				
Sector	Bullish Period		Bearish Period				
	Average Returns	Standard Deviation of Dispersion	Average Returns	Standard Deviation of Dispersion			
Construction	7.81	10.32	-2.14	26.83			
Trading/Services	9.34	9.64	-2.29	21.38			
Hotels	12.15	18.37	-2.93	24.81			
Consumer Products	6.24	8.78	-1.88	17.43			
Finance	11.28	12.94	-2.44	23.90			
Industrial Products	7.58	8.99	-2.54	20.10			
Mining	13.41	11.65	-2.33	23.98			
Plantations	13.00	14.75	-2.05	16.27			
Properties	10.14	11.67	-3.06	23.76			
Trust	11.80	37.00	-1.60	16.89			
All Sectors	9.48	10.65	-2.39	20.69			

As presented in Table 1, the average return and standard deviation of dispersions for stocks in all sectors are -0.04 percent and 12.57 percent respectively. The average return recorded its highest at 0.43 percent for the plantations sector and its lowest at -0.65 percent for the hotels sector. The highest standard deviation of dispersion is 16.85 percent for trust sector and the lowest standard deviation of dispersion was the consumer products sector with 10.64 percent. By the nature of the characteristics of the consumer products sector, low standard deviation of dispersions were obtained in both sub-sample period 1 (1992-1996) and sub-sample period 2 (1997-2001).

For the sub-sample period 1 (1992-1996), the finance sector recorded the highest average monthly return of 2.76 percent with the standard deviation of dispersion of 10.56 percent. In the sub-sample period 2 (1997-2001), all sectors in the KLSE reported -1.91 percent of average monthly return and standard deviation of 14.58 percent. This was consistent with the downward market movement during sub-sample period 2 of 1997 to 2001.

It is interesting to note that the average monthly return for sub-sample period 1 (1992-1996) was positive for all sectors and across individual sector. Nonetheless, the contrasting observations

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were found in the sub-sample period 2 (1997-2001), making the monthly average returns for the full-sample period (1992-2001) negative as a whole.

The Table 1 further reports the average return and standard deviation of dispersion during both bullish (January to December 1993) and bearish (July 1997 to June 1999) periods. In the 1993 bull market, price increases cannot be viewed as a simple reaction to earnings increases. The 1993 bull run was never before experienced by the Kuala Lumpur Stock Exchange. The mining and plantations sectors posted a 13.41 percent and 13 percent of average return respectively. The stocks in the trust sector reported the highest standard deviation of dispersions. In contrast, stocks in the consumer products and industrial products sectors showed the lowest standard deviation of 8.78 percent and 8.99 percent, respectively.

During the bearish period, the properties sector showed a -3.06 percent average return with standard deviation of dispersion of 23.76 percent. The low level of return and high standard deviation was consistent with the nature of performance of properties sector during periods of market downturn and financial crisis. Many housing and mega projects were affected. Some of them were deferred or even withdrawn (Kynge & Ridding, 1997).

Table 2 shows the regression coefficient estimates for the 10 sectors and across various sectors in extreme market movements by using both 1 and 5 percent criterion. It also shows estimates for  $\alpha$  (alpha),  $\beta_1$  and  $\beta_2$ . The constant ( $\alpha$ ) indicates what the average dispersion, the central 90 percent of the market return distribution. The first row of Table 2 indicates the estimates of  $\beta_1$  and  $\beta_2$  for the entire sample. The  $\beta_1$  coefficient on the indicator variables indicates how much the dispersion changes when the market return is in the bottom 1 or 5 percent of the market return distribution, which is also known as lower market stress. On the other hand, the  $\beta_2$  coefficient on the indicator variables indicates how much the dispersion changes in upper market stress context.

The estimates for  $\beta_1$  coefficient are negative across 10-sectors for lower market stress context under both 1 and 5 percent criterion. The negative coefficient of  $\beta_1$  is consistent with the prediction of herd behavior in the 10-sectors during periods of market downturn. The presence of herd behavior reflects the market participants' unwillingness to bet against the consensus of the market and thus the individual return would not stray from the cross-sectional average returns.

On the contrary, during the market upturn, no evidence of herd behavior was documented in which positive coefficients  $\beta_2$  were found (see Table 2). The trust and plantations sectors recorded positive estimates of 1.69 and 0.97 respectively, followed by the industrial products sector of 0.74. The dispersions were significantly larger during positive price swings. The positive  $\beta_2$  coefficients during upper market stress context are consistent with the prediction of rational asset pricing model. It should be pointed out that not many differences except some degree of magnitude of coefficient were observed when we used sectoral indices as the market proxy (see Table 3).

Sector	1 percent criterion			5 percent criterion		
	$\alpha$	$\beta_1$	$\beta_2$	$\alpha$	$\beta_1$	$\beta_2$
<b>All Sectors</b>	10.25	-0.25 (-3.69)	0.63 (3.67)	10.19	-0.25 (-3.69)	0.52 (3.51)
<b>Construction</b>	8.85	-0.21 (-2.31)	0.61 (5.30)	9.14	-0.20 (-2.24)	0.54 (4.92)
<b>Trading/Services</b>	10.85	-0.25 (-3.63)	0.49 (1.98)	10.84	-0.25 (-3.73)	0.49 (1.98)
<b>Hotels</b>	9.40	-0.25 (-2.55)	0.24 (0.62)	9.40	-0.25 (-2.55)	0.24 (0.62)
<b>Consumer Products</b>	9.45	-0.29 (-3.96)	0.45 (2.11)	9.62	-0.25 (-3.67)	0.50 (3.09)
<b>Finance</b>	10.13	-0.21 (-2.58)	0.09 (0.54)	10.03	-0.22 (-2.74)	0.33 (3.24)
<b>Industrial Products</b>	9.54	-0.29 (-4.73)	0.74 (3.83)	9.56	-0.29 (-4.86)	0.74 (3.83)
<b>Mining</b>	10.31	-0.36 (-3.19)	0.35 (1.03)	10.31	-0.36 (-3.19)	0.35 (1.03)
<b>Plantations</b>	8.72	-0.24 (-3.34)	0.97 (4.25)	8.68	-0.25 (-3.50)	0.97 (4.25)
<b>Properties</b>	11.20	-0.28 (-3.47)	0.42 (1.59)	11.12	-0.26 (-3.45)	0.31 (1.25)
<b>Trust</b>	6.21	-0.07 (-0.97)	1.69 (4.61)	5.90	-0.08 (-1.10)	1.54 (4.66)
<b>Notes:</b>	<b>Heteroscedastic-consistent t-statistics are in parentheses</b>					
	<b>* The proxy used for market return is the Kuala Lumpur Stock Exchange Composite Index (KLSE CI)</b>					

Under the both 1 and 5 percent criterion, most of the estimates for  $\beta_2$  are greater than those of  $\beta_1$ . The estimates of  $\beta_2$  of construction, trading and services, consumer products, industrial products, and plantations sectors are between two to three times greater than those for  $\beta_1$  under the both 1 and 5 percent criterion. These results imply that the increase in dispersion across sectors

during dramatic up markets is much more aggressive than during market downturn. It appears that the presence of herd behavior is more prevalent during market downturn.

Sector	1 percent criterion			5 percent criterion		
	$\alpha$	$\beta_1$	$\beta_2$	$\alpha$	$\beta_1$	$\beta_2$
<b>All Sectors</b>	9.37	-0.32	0.48	9.37	-0.32	0.48
		(-4.80)	(3.28)		(-4.80)	(3.28)
<b>**Construction</b>	9.27	-0.24	0.58	9.64	-0.24	0.52
		(-3.67)	(1.33)		(-3.71)	(1.19)
<b>**Trading/Services</b>	10.94	-0.17	0.48	10.85	-0.17	0.46
		(-2.46)	(1.75)		(-2.58)	(1.77)
<b>**Consumer Products</b>	8.02	-0.36	1.42	7.97	-0.36	1.36
		(-4.70)	(7.29)		(-4.70)	(7.34)
<b>Finance</b>	9.24	-0.29	-0.27	9.24	-0.29	-0.27
		(-4.74)	(-0.56)		(-4.74)	(-0.56)
<b>Industrial Products</b>	9.45	-0.34	0.94	9.46	-0.33	0.93
		(-5.22)	(6.52)		(-5.34)	(6.67)
<b>Mining</b>	9.64	-0.30	0.47	9.64	-0.30	0.47
		(-4.68)	(0.84)		(-4.68)	(0.84)
<b>Plantations</b>	7.84	-0.30	1.08	7.91	-0.30	0.94
		(-4.05)	(4.30)		(-4.05)	(4.74)
<b>Properties</b>	12.37	-0.41	-0.02	11.84	-0.38	-0.25
		(-6.40)	(-0.02)		(-5.95)	(-0.27)

**Notes:**  
**Heteroscedastic-consistent t-statistics are in parentheses**  
**\* The proxy used for market return is the individual sector index.**  
**\*\* Data for construction, trading/services, and consumer products sectors started in Nov. 1993**

Table 4 shows the ten largest positive and negative average monthly cross-sectional returns, their associated actual dispersion and the Kuala Lumpur Stock Exchange Composite Index (see Figure 1 in Appendix). The top three positive monthly cross-sectional average returns were February 1998, November 1998, and December 1993. On the other hand, the three largest negative returns were recorded in the months of November, August and October 1997. These months fell within the bullish and bearish period in the history of the Malaysian stock market, thus, it is interesting to further explore the real extreme market stress environment. In relation to these, the performances of these months are linked to major financial events within the respective months for in-depth insights.

The market rally in the month of February 1998 with the monthly cross-sectional returns of 40.36 percent and standard deviation of dispersion of returns of 24.64 percent was prompted by exciting news. Magesvaran (1998) acknowledged that the market was poured with liquidity immediately after the one week Chinese New Year and Hari Raya festive break with the KLSE CI flying high on the first day back. In addition, market sentiment was also encouraged by positive comment from World Bank Chief, James Wolfensohn, announcement by Bank Negara Malaysia, the central bank of Malaysia on the reduction of statutory reserve ratio (SRR) from 13.5 percent to 10 percent effective from February 16, and the speculation of merger and acquisitions within the financial sector. McNulty (1998) added that Bank Negara extended the March 31 deadline for the consolidation of the banking and finance sectors. As a result, finance companies were only required to announce with whom they wished to merge.

<b>Table 4: Identification of Ten Largest Positive and Negative Cross Sectional Average Monthly Returns, Their Associated Dispersions and KLSE CI from 1992 to 2001 in the KLSE</b>			
<b>Largest Positive Monthly Cross-Sectional Average Returns</b>			
<b>Month</b>	<b>Average Return (%)</b>	<b>Standard Deviation of Dispersion (%)</b>	<b>Kuala Lumpur Stock Exchange Composite Index (KLSE CI)</b>
February 1998	40.36	24.64	745.36
November 1998	32.96	17.60	501.47
December 1993	31.17	21.48	1275.32
September 1998	29.19	22.97	373.52
April 1999	28.70	16.18	674.96
June 1999	22.68	18.33	811.10
October 1993	19.53	19.65	971.99
August 1994	18.21	13.38	1130.01
April 1993	16.20	15.42	719.61
February 1995	15.93	10.93	979.64
<b>Largest Negative Monthly Cross-Sectional Average Returns</b>			
<b>Month</b>	<b>Average Return (%)</b>	<b>Standard Deviation of Dispersion (%)</b>	<b>Kuala Lumpur Stock Exchange Composite Index (KLSE CI)</b>
November 1997	-35.08	25.22	545.44
August 1997	-30.82	17.86	804.40
October 1997	-26.11	15.22	664.69
March 1994	-24.24	11.79	952.72
January 1994	-22.82	14.01	1106.99
April 1998	-20.55	16.25	625.97
August 1998	-19.94	18.15	302.91
September 2001	-17.02	12.11	615.34
January 1995	-16.72	10.08	883.29
September 2000	-16.11	12.06	713.51

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The market was surprisingly resilient during November 1998 despite the unique exchange control implemented and the then Deputy Prime Minister Datuk Seri Anwar Ibrahim court case in September 1998. Hamsawi (1998) reported that the market reacted favorably and was stimulated by Wall Street's strong performance. Market sentiment improved further after the restructuring exercises of listed companies placed under Section 176 to be removed from the list. Investor confidence was improved with certainty in trading rules. As explained by Majid (1998), the stock market stability and transparency were enhanced with the amendments to the securities laws introduced in November 1998.

The key factors driving the impressive bull runs in December 1993 were partly due to the stable political and economic environment within the country and world-wide prosperity as a whole. "Malaysian Stocks," (1993) quoted the Kuala Lumpur Stock Exchange (KLSE) as one of the hottest stock markets in the world and the largest stock market in Southeast Asia. Aponte (1993) and Leo (1993) indicated the bull rally in the Malaysian market was not on its own, but a result of worldwide liquidity as fund managers moved money into the regional market. Further to this, Sivanithy (1993) highlighted the phenomenal interest in the Central Limit Order Book (CLOB) counters as one of the factors contributing to the bull run as well.

The high negative returns may mainly be brought by the negative and dramatic Asian financial crisis that struck most of the countries in Asia including Malaysia after the free floating of Thailand Baht on 2 July 1997. In 1997, the Malaysian stock market experienced one of its worst bearish run as the financial crisis led to the crash of Malaysian stock market, sending down prices of stocks as well as the confidence of the investors. Tharmaratnam and Wee (1997) observed that corporate bailout worries took prominence following the UEM/Renong deal and the government's takeover of the Bakun hydroelectric dam project from Ekran. Both the news was perceived negatively and as a result the market took a dive in November 1997, falling below 600 on the KLSE CI. The surprise move of UEM to acquire a 32% stake in Renong was widely seen as rescuing cash-strapped Renong by cash rich UEM (who in turn is the operator of the North-South Expressway and has good cash flow). This raised investors' fear that similar rescue could occur to other cash rich companies. The deal also triggered Rating Agency Malaysia (RAM) concerns by putting both of the companies on unfavorable rating watch. Parameswaran (1997) added that the collapse of the Japanese brokerage Yamaichi Securities also severely eroded market confidence and sentiment in November 1997.

The negative market sentiment in August 1997 was mainly emanating from the sharp depreciation of the ringgit, weak exports and capital control. Kyng and Ridding (1997) reported that the currency crisis triggered by the Thai Baht devaluation spread like wildfire in the regional market. "Thrown By," (1997) noted that the ringgit dipped to a new historic low in end of August. As the currency weakened, capital continued to flee the market. In addition, Kyng and Ridding (1997) acknowledged the market depressed further when investors were confused by the contradictory statements announced by the Malaysian Prime Minister and Deputy Prime Minister

on the deferment of some key mega projects. Toh (1997b) pinpointed to the macro-economic figures which showed a worrying trend, the trade deficit in June increased to a worse-than-expected RM2.8 billion which drove down market sentiment. Bank Negara Malaysia introduced capital control on August 4, by which banks were to limit commercial swap transactions to US\$2 million per customer. In view of this, the control limited the ringgit's availability to foreign speculators.

Poor sentiment in October 1997 was primarily due to the rapid stock price declines, which fed on the very weak currency trend since July 1997. Kyng (1997) and L.E. Tan (1997) observed that there was market disappointment when the country's 1998 budget failed to live up the expectations of austerity, as the government seemed to be holding unrealistic assumptions. Fiscal measures announced were perceived as not tough enough to tackle the economic problems within the country. Furthermore, the self-denial mentality when addressing financial problems also eroded investors' confidence.

Table 5 illustrates the regression coefficients during another market stress periods - the bullish and bearish ones - as indicated earlier. During the bullish period, both estimates of  $\beta_1$  and  $\beta_2$  exhibited both negative and positive coefficients as a whole. Given these results, no clear herding behavior can be inferred and this warrants further investigation.

Sector	1 percent criterion			5 percent criterion		
	$\alpha$	$\beta_1$	$\beta_2$	$\alpha$	$\beta_1$	$\beta_2$
<b>Jan 1993 - Dec 1993 (Bullish Period)</b>						
<b>All Sectors</b>	20.61	7.41	1.21	20.61	7.41	1.21
		n/a	(6.97)		n/a	(6.97)
<b>Construction</b>	7.44	-0.86	1.50	7.44	-0.86	1.50
		(-0.36)	(0.84)		(-0.36)	(0.84)
<b>Trading/Services</b>	29.24	11.07	-0.78	29.24	11.07	-0.78
		n/a	(-1.84)		n/a	(-1.84)
<b>Hotels</b>	9.74	-0.46	0.10	9.74	-0.46	0.10
		(-1.78)	(0.10)		(-1.78)	(0.10)
<b>Consumer Products</b>	10.28	n/a	0.12	10.28	n/a	0.12
		n/a	(0.23)		n/a	(0.23)
<b>Finance</b>	21.40	7.80	-0.10	20.74	7.80	0.37
		n/a	(-0.17)		n/a	(1.52)
<b>Industrial Products</b>	17.54	7.56	2.49	17.54	7.56	2.49
		n/a	(1.72)		n/a	(1.72)
<b>Mining</b>	15.37	5.61	1.73	15.37	5.61	1.73
		n/a	(0.86)		n/a	(0.86)
<b>Plantations</b>	24.34	9.73	1.06	24.34	9.73	1.06
		n/a	(3.96)		n/a	(3.96)

**Table 5: Regression Coefficients on Monthly Dispersions During Periods of Market Stress (Bullish and Bearish Periods) from 1992 to 2001 in the KLSE**

Sector	1 percent criterion			5 percent criterion		
	$\alpha$	$\beta_1$	$\beta_2$	$\alpha$	$\beta_1$	$\beta_2$
<b>Properties</b>	20.62	4.38	-0.68	20.62	4.38	-0.68
		n/a	(-0.34)		n/a	(-0.34)
<b>Trust</b>	2.48	-0.31	2.86	2.48	-0.31	2.86
		(-1.80)	n/a		(-1.80)	n/a
<b>July 1997 - June 1999 (Bearish Period)</b>						
<b>All Sectors</b>	13.04	-0.04	0.85	13.04	-0.04	0.85
		(-0.32)	(2.43)		(-0.32)	(2.43)
<b>Construction</b>	13.70	0.13	0.55	13.70	0.13	0.55
		(0.80)	(2.94)		(0.80)	(2.94)
<b>Trading/Services</b>	13.57	-0.08	0.60	13.57	-0.08	0.60
		(-0.70)	(3.17)		(-0.70)	(3.17)
<b>Hotels</b>	8.46	-0.17	1.05	8.46	-0.17	1.05
		(-0.98)	(2.05)		(-0.98)	(2.05)
<b>Consumer Products</b>	13.74	-0.05	-0.27	13.41	-0.09	-0.27
		(-0.24)	n/a		(-0.62)	n/a
<b>Finance</b>	12.01	0.04	0.83	12.66	0.04	0.52
		(0.27)	n/a		(0.27)	(5.35)
<b>Industrial Products</b>	10.60	-0.08	1.46	10.60	-0.08	1.46
		(-0.70)	(2.75)		(-0.70)	(0.22)
<b>Mining</b>	15.10	-0.13	-0.09	15.10	-0.13	-0.09
		(-0.55)	(-0.23)		(-0.55)	(-0.23)
<b>Plantations</b>	14.86	-0.01	0.01	14.86	-0.01	0.01
		(-0.07)	n/a		(-0.07)	n/a
<b>Properties</b>	16.58	-0.08	-0.16	16.58	-0.08	-0.16
		(-0.45)	n/a		(-0.45)	n/a
<b>Trust</b>	6.90	0.33	-0.46	8.06	0.15	0.14
		(1.34)	n/a		(0.70)	(0.29)
<b>Notes:</b>						
n/a denotes not applicable						
Heteroscedastic-consistent t-statistics are in parentheses						

On the other hand, in the case of the bearish period, the estimates of  $\beta_1$  and  $\beta_2$  exhibited more negative but were not statistically significant in general. The negative coefficient is consistent with the prediction of herd behavior in which the individual stock returns would not stray away from the cross-sectional average returns.

We can find no explanation other than investors' psychological influences to account for the findings of the herding behavior in the extreme lower market stress and bearish periods. Tvede (1999) pointed out that when human beings are in doubt, they tend to look to others for answers. It is quite easy to imagine when an investor sees stock prices continue to fall, the investor likes to use other people's judgement as the basis for his or her decisions. Investors as a whole prefer to follow the opinion of others rather than form their own opinions.

This can be seen from the survey conducted by Shiller (1987) on nearly 900 investors within a few days after the October 1987 crash. Two thirds of the respondents indicated that investor psychology was more responsible for the stock market crash than fundamental changes. Investors viewed the declining stock prices as important information when compared to economic fundamental factors such as corporate earnings and interest rates.

During the market downturn, the investors herd around and followed the crowd, hence, causing the stock prices to plunge even further. Keynes (1936), Scharfstein and Stein (1990), and Lifson and Geist (1999) had explained that investors may be reluctant to act according to their own information and beliefs, fearing that their contrarian behavior will damage the reputation as sensible decision makers. If an investor is successful when he or she follows the general belief, his or her decision is rewarded since it conforms to the general belief. However, if he or she is unsuccessful, his or her decision will be perceived fine as he or she is not the only one to do so. Many other people make similar mistakes and share the blame together. Conversely, if an investor follows a contrarian investment or any unconventional investment strategy, and if it fails to perform, he or she will be perceived as incompetent and will not receive much acknowledgement from his or her peers. Worldly wisdom teaches that it is better for reputation to fail conventionally than to succeed unconventionally.

The fear over the financial crisis during the bearish period in the KLSE is evident from a review in the Investors Digest about stock picking in the KLSE. To this extent, Sun (1997) reported that fund managers expressed their concerns on the performance of the KLSE and viewed that the market seemed to have overreacted with the collapse in stock valuation where many stocks were selling substantially below the par value.

"Discarding The," (1997, p.4) reported that "fragile faith seems to govern the Kuala Lumpur Stock Exchange, where players still move like a herd of cows. Going by the recent lunatic reaction on the local bourse, little has changed in terms of the sentiments of market players, despite the lessons they ought to have learnt from the last four months of turmoil and efforts to improve the situation. The herd mentality rules in the KLSE and the love affair with damning rumors still continues. Facts and statistics were irrelevant, players herded themselves and acted upon the assumptions that they needed to cut their losses and get out fast, just like everyone else. The mood spread like wildfire and in a day we burnt to ashes some hard-earned wealth."

Toh (1997a) recapitulated the Malaysian stock market scenario in 1997 and further indicated that "market players, both retail and institutional, are not always rational as many are still largely

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guided by sentiment. They often get caught up in a herd instinct even if the lemming-like rush only leads to a plunge into the sea. It is unfortunate that many market players still base their investment decisions on idle chatter."

### CONCLUSION

The results reveal the presence of herd behavior in the Malaysian stock market in which it is more prevalent in the lower market stress and bearish periods. Investors are perceived irrational as they are unwilling to make their own decisions. Instead, they follow the collective actions of the market. This behavior further implies that the violation of the rational people assumption in which standard modern finance is based. The result is consistent with Shefrin (2000) who suggest that the need for market participants to understand the impact of psychology has on them and those around them. If they ignore psychology, they do so at their own risk. Future research that reconstructs financial theories along with human behavior and psychology would be of interest, as well as possibly providing important insights when such investors' behavior cannot be understood under modern finance theories.

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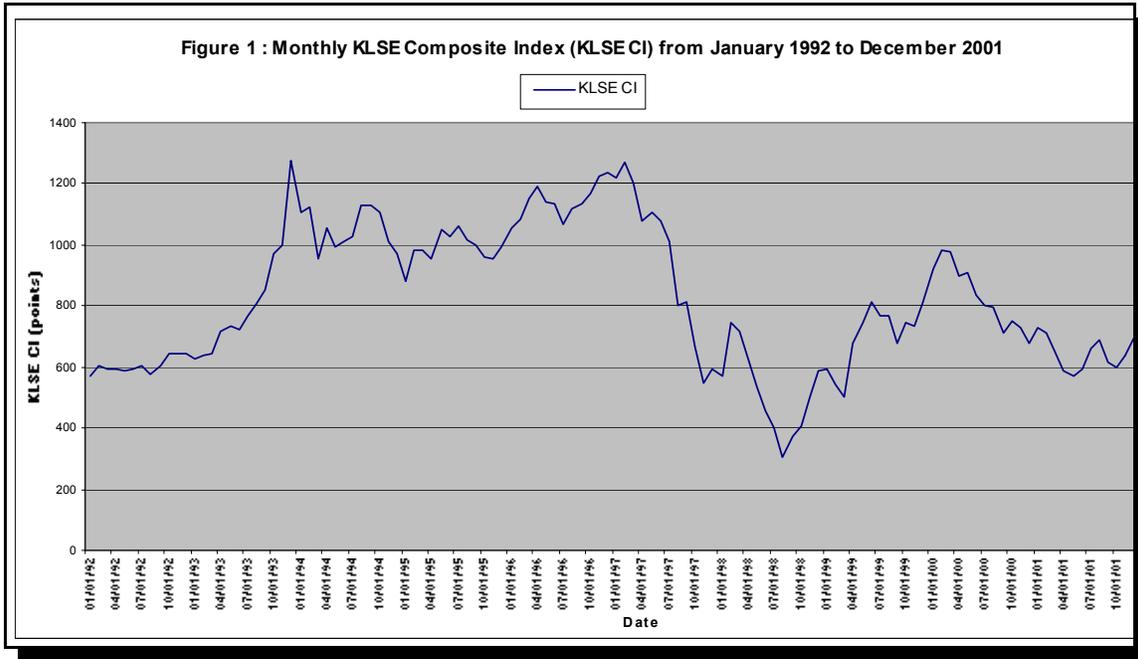
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APPENDIX



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## PORTFOLIO DECISIONS AND THE SMALL FIRM EFFECT

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### ABSTRACT

*Many empirical studies have found excess returns on the stocks of small firms. This "small firm effect" may cause individual investors to choose to diversify into smaller firms when they make asset allocation decisions. This paper questions whether investors should consider the small firm effect. Monte Carlo simulations cast doubt on the small firm effect. We urge investors to exercise caution when buying small stocks.*

*The views expressed in this paper are those of the authors and do not necessarily represent the views or policies of the International Monetary Fund. This paper describes research by the authors and is published to elicit further debate. The authors are indebted to Stephen Smith, Peter Dadalt, Jacqueline Garner and an anonymous referee for several useful comments and suggestions.*

### INTRODUCTION

Many empirical studies have observed excess returns on the stocks of small firms. For example, Ibbotson and Sinquefeld (1999) report that common stocks earned an average annual return of 13.2 percent from 1926 to 1998 while small capitalization stocks earned an average annual return of 17.4 percent. This implies an excess annual return of 4.2 percent before adjusting for risk. Investors often include small stocks in their portfolios because they expect to receive higher returns. The higher returns will enable them to reach their goals or to reach their goals sooner. These investors are usually aware of the increased level of volatility associated with the returns of small stocks but they expect to be generously rewarded for the additional risk. According to this assumption, they will receive more return per unit of risk than if they had invested in the stocks of larger firms. We question whether this assumption is valid and whether the small firm effect (SFE) truly exists in the markets or whether it is an artifact of the datasets that are studied. By investing in small stocks, investors may be accepting even more risk than they believe they are.

Reinganum (1981/1999) finds excess risk-adjusted returns on small firms. Aharony and Falk (1992) find that small banks' returns second-order stochastically dominate returns for large banks.

Roll (1981) offers an explanation for the phenomenon. He conjectures that the SFE may be attributable to improper estimation of systematic risk due to non-synchronous trading. According to this hypothesis, infrequent trading of smaller firms' stocks leads to autocorrelation in the returns for portfolios of small stocks. This, in turn, leads to an underestimation in their variances and systematic risk. Reinganum (1982), however, tests Roll's proposition and concludes that the SFE continues to be significant even after correcting for non-synchronous trading. Isberg and Thies (1992) attribute the SFE to the higher direct and indirect transaction costs involved in investing in small firms and the difficulty associated with measuring these. Wei and Stansell (1991) find that benchmark error (measurement error on the market) may explain the SFE. Knez and Ready (1997) find that the risk premium on size completely disappears when they use a regression technique that trims the one percent most extreme data observations each month. They believe that the differences in how various small firms grow determine the higher returns on small firms.

None of the above studies consider survival as a possible problem. Aharony and Falk (1992) test for the presence of survivorship bias arising out of the non-inclusion of failed firms. They do so by testing for differences in results between the entire sample period and a sub sample when no firms fail. However, the bias due to survival is present in the first period even though no firms fail in the sub sample period. On the other hand, survival, as we define it, refers to the fact that "default" states are not observed for the firm. Hence, the time series data on the stock does not comprise a representative sample for drawing inferences. Survival is a problem in the sense that this incompleteness of the dataset leads to biased measurements.

Past studies of the SFE have not corrected for the upward bias in observed mean returns arising out of survival. This upward bias increases proportionally with the probability of default and it is generally acknowledged that the probability of default is higher for small firms than for large firms. For example, consider a security with a true expected return of 12.5 percent. A 2 percent probability of default biases the observed mean returns upward by 2.3 percent. A 3 percent probability of default biases the observed mean returns upward by 3.48 percent. See Best and Smith (1993). The SFE has been noticed in tests of models of mean-variance efficiency (e.g. CAPM), but some of the observed excess return could be explained by a downward bias in the observed betas or insufficient risk adjustment for small firms. Therefore, the excess return may result from an upward bias in the mean and a downward bias in the beta. These excess returns on account of survival would be observed even if CAPM held and markets were always mean-variance efficient.

In this paper, we examine the hypothesis that the SFE is an empirical artifact resulting from differences in the survival rates across firms. Our study's results support the hypothesis that the SFE may be explained by survivorship bias in the sample data and that investors should be more cautious when including small stocks in their portfolios.

The rest of the paper is organized as follows. The literature on survival bias for stocks is discussed in the second section. The motivation and the simulations methodology used in this study

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are described in the third section. Hypothesis tests and results from the simulations are reported in the fourth section. The last section provides the conclusions.

### **PRIOR STUDIES ON SURVIVAL**

Almost all securities in the market have some positive probability of default. This concept is modeled in Best and Smith (1993) and Brown, Goetzmann and Ross (1995). Best and Smith (1993) study the impact of survivorship bias in a setting where investors are risk neutral. They find that when the probability of default is included in a regression, the CAPM does not have any significant explanatory power over expected returns. Brown, Goetzmann, and Ross (1995) find that survival creates an upward bias in the expected returns of equity time-series data. They urge caution in interpreting the results of equity premium puzzle studies, event studies, and stock split studies.

Some studies model survivorship bias as the bias arising out of the non-inclusion of failed firms in a sample. They attempt to determine whether it is possible to predict future performance using past performance. They argue that the sample drawn for such a study suffers from survivorship bias owing to the non-inclusion of failed firms. The exclusion of failed firms from the sample biases the performance of the sample over the second time period and leads to an illusion of persistent good performance. Brown, Goetzmann, Ibbotson, and Ross (1992) consider samples that are truncated by survivorship bias. They suggest that an adjustment for survivorship bias by including failed firms in the sample should solve this seeming market imperfection. The empirical evidence on this is mixed. Blake, Elton and Gruber (1993) find no evidence of predictability using past performance for bond mutual funds after adjusting for survivorship bias. On the other hand, Hendricks, Patel and Zeckhauser (1993) find persistence in performance for no-load growth oriented mutual funds even after adjusting for the bias. Carpenter and Lynch (1999) simulate tests of mutual fund performance introducing survivorship bias. They reinforce the conclusion from previous studies that, even adjusting for survival bias, mutual fund performance is truly persistent. Kothari, Shanken and Sloan (1995) isolate and analyze the difference in returns between data from the Center for Research in Security Prices (CRSP) and data from Standard and Poor's Compustat Service. They argue that there is significant survivorship bias on the Compustat tapes. This implies that the results of previous empirical studies using Compustat data (e.g. Fama & French, 1992) may be partially explained by the existence of these sample selection biases.

In a more recent paper, ter Horst et al, 2001, show that standard methods of analysis that correct for survivorship bias are subject to look-ahead biases. They show that correcting for survivorship by including failed firms induces a spurious U-shaped pattern in performance persistence. They also show how one can correct for look-ahead bias by using weights based on probit regressions.

## MONTE CARLO SIMULATIONS METHODOLOGY

CRSP tapes report stock prices and returns for all stocks listed on the NYSE, AMEX and NASDAQ exchanges. Securities of firms that default fail to meet the exchange's listing criteria at some point and are delisted. Viewed in another manner, default/failure states are not observed for the stocks that are listed on these exchanges. Therefore, not only are the failed securities dropped from a sample, but also the surviving securities' returns are inaccurately measured. This is the source of a "survival" bias in studies using CRSP data. The observed moments of the returns distributions are the moments of the distribution conditional on survival. This entails that: 1) the observed mean is higher than the true mean, 2) the observed variances are downward biased estimates of the true variance, and 3) the observed beta is biased. For example, Best and Smith(1993) show that:

$$E[R] = E[R/N](1 - \gamma) - \gamma$$

where R = the returns on the security,  
N are the survival states,  
 $\gamma$  is the probability of failure/default.

The above assumes that realized returns to stocks in failed firms are a negative 100 percent. As expected, for a given  $E[R]$ ,  $E[R/N]$  is increasing in  $\gamma$ , so that the difference between true and observed returns is also increasing in  $\gamma$ . Note that correcting for survivorship bias merely by including failed firms is an inadequate correction for the bias arising out of the survival of a security. Parameter estimates for surviving firms will continue to be biased even though the sample includes failed firms, since it is the distribution of the individual security that needs to be corrected for the non-observance of failure states.

We agree with Altman, Haldeman, and Narayanan (1977), who show that the probability of failure is greater for smaller firms. This implies that observed mean returns are overstated for small firms. In addition, if observed betas are lower than true betas for small firms, the SFE may be explained by an understatement in required returns. This in fact, is the central hypothesis of our paper. Here, we model the difference between observed and true betas. Other studies have also hypothesized an understatement in computed betas relative to true betas for small firms. However, the understatement in those studies arises out of sources other than survival. We show that this difference is related to the probability of failure and potentially explains the SFE.

We use Monte Carlo simulations to isolate the misspecification arising out of survival from the market efficiency hypothesis. As a first step in our simulations and to mimic the CAPM framework, we generate a finite set of securities with their complete "true" distributions. The "market" we generate is a mean variance efficient portfolio of the original securities. Thereafter, we compute "true" betas of the securities based on the complete true distributions. Thus, our

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simulation creates a situation where the market is indeed a mean-variance efficient portfolio and all securities earn true returns in accordance with their betas.

Our next step is to compute "observed" betas based only on the "survival" states in the distribution. It is important to realize that for all stocks in the market, *at any point in time*, the observed multivariate distribution contains only survival states for all securities. For example, one cannot observe returns for IBM where Microsoft has been in default and vice versa. One can only observe returns where both IBM and Microsoft have survived. Therefore, in this study, we incorporate the effect of survival, by dropping realizations of the distribution where any security is in default. ter Horst, et al, 2001, show that correcting for survivorship bias by including failed firms is subject to look-ahead bias (spurious U-shaped pattern in performance persistence), when analyzing the performance of mutual funds. We then compute "observed" betas. This approach does not incorporate time-varying betas.

The Monte Carlo simulations of securities and market returns enable us to isolate the bias as the difference between true and observed betas. We then test the hypothesis that survival causes measurement error in returns and betas causing the illusion of a SFE.

We report summary statistics for these variables in Table 1. The beta of the market will always be 1, regardless of survival bias and by construction. Therefore, survival bias will imply that for some stocks,  $\hat{\beta}$  is upward biased, and is downward biased for other stocks. True betas are distributed between 0.7039 and 1.2117 and have an unweighted mean of 0.9182. Observed betas are distributed between 0.6832 and 1.2113 and have an unweighted mean of 0.9137. On average the observed betas are lower than true betas. The difference ( $\hat{\beta} - \beta_i$ ) has a mean close to zero and is distributed between -0.0619 and 0.0286. Given that the equity risk premium in the market is approximately 8.5 percent, the security that has the biggest downward biased beta ( $\hat{\beta} - \beta_i = -0.0619$ ) will have its expected return biased downwards by approximately 53 basis points, relative to its true expected return ( $8.5 \times .0619 = 0.525$ ). In this case, realized returns will appear to have "excess returns". The stock that has the most upward biased beta ( $\hat{\beta} - \beta_i = 0.0286$ ) will have its expected return biased upwards by approximately 24 basis points, relative to its true expected return ( $8.5 \times .0286 = .243$ ). In this case, realized returns will appear to not compensate the investor for risk. This creates a bias of approximately 77 basis points in expected returns between the two stocks. The question, of course, arises whether betas are likely to be biased downwards for smaller stocks and upwards for larger stocks.

The details of the simulation are as follows:

First, we generate 100 independent normal return distributions with 5000 observations each. The mean of the independent normal distributions is picked randomly from a uniform distribution (over the range 4 to 19 percent). The mean for the independent normal distributions is bounded below 4 percent because of the requirement that the riskless asset should dominate no security. We assume a return of 4 percent for the riskless asset. The standard deviation is also picked randomly from a uniform distribution (over the range 0 to 300 percent).

"Securities" are created using weighted combinations of the independent normal distributions. The weights are also picked randomly from a uniform distribution (over the range 0 to 1). Using weights from a distribution over the range 0 to 1 ensures two things. First, all securities will have an "expected return" greater than 4 percent, and second, they will have mostly positive covariances. In practice, most stocks are observed to have positive covariances.

For every security return that is less than -100 percent, the security return is set to -100 percent. In this manner, the security's distribution is truncated at -100 percent in order to be consistent with limited liability.

The securities, thus modified, have expected returns distributed between 9.98 percent and 14.3 percent and standard deviations distributed between 16.4 percent and 45.1 percent. It is worth pointing out that expected returns and standard deviations are randomly picked in this simulation, and some of the securities that are associated with high risk do not come with a higher expected return. Therefore, they may be stochastically dominated by other securities in the set and will not be optimally included in an efficient portfolio.

The riskless security is assumed to have a rate of return equal to 4 percent.

We compute the "market" as a mean variance efficient portfolio of the 101 securities (100 risky securities and one riskless security) through a standard mean variance optimization routine with constraints; the constraints imposed are that the market must yield an expected return of 12.5 percent, and that all securities must have non-negative weights in the market portfolio. These parameters are consistent with statistics for the history of the CRSP tapes. (See Ibbotson & Sinquefeld, 1999).

The optimization routine reports the weights of the individual securities in the resulting market portfolio. On average, only about 28 securities have a positive weight in the market portfolio, and the rest have a zero weight. The resulting market portfolio has a standard deviation of approximately 20 percent.

We drop securities that have zero weight in the market portfolio from subsequent computations. Including these securities will, in fact, bias results since they have been optimally excluded from investors' portfolios and their behavior can not carry any implications for efficient markets or asset pricing. Indeed, using an equally weighted portfolio of all 100 securities faces a similar problem. In simulations, it is first necessary to establish that the securities included in a market portfolio are "optimal" so that investors would choose to hold them.

We now compute the "true" beta ( $\beta$ ) for each security by regressing individual security returns against the market portfolio.

We compute the probability of default ( $\gamma$ ) for each security by counting the number of observations for which the security's return is equal to -100 percent and dividing that number by the total number of observations. The probability of default ( $\gamma$ ) across securities in the simulations ranges from 0 to about 0.86 percent.

We introduce a survival bias into the simulations by dropping those observations where any security has a return of -100 percent and we retain only those observations where none of the securities is in default. The survival bias introduced here would pertain primarily to the states when the security is finally delisted and it becomes worthless. Clearly, most of the loss in value happens prior to delisting; these are states where the returns are greater than -100 percent, although negative. On average, approximately 1 percent of the stocks on the CRSP tapes disappear each year because of delisting.

Biased standard deviations for the simulations range between 15.7 and 44.3 percent while biased expected returns range between 11 and 16 percent.

We compute the "observed" beta ( $\hat{\beta}$ ) for each security using the incomplete distribution of the security and market returns.

The variables generated in the simulation are:

$\bar{R}_i$  = "true" expected return on security  $i$ ,  $i = 1 \dots n$ .

$\hat{R}_i$  = "observed" expected return on security  $i$ ,  $i = 1 \dots n$ .

$\beta_i$  = "true" beta of security  $i$ ,  $i = 1 \dots n$ .

$\hat{\beta}_i$  = "observed" beta of security  $i$ ,  $i = 1 \dots n$ .

$\gamma_i$  = probability of default/failure of security  $i$ ,  $i = 1 \dots n$ .

**Table 1: Summary Statistics**

$\bar{R}_i$ = "true" expected return on security i, i = 1...n.				
$\hat{R}_i$ = "observed" expected return on security i, i = 1...n.				
$\beta_i$ = "true" beta of security i, i = 1...n.				
$\hat{\beta}_i$ = "observed" beta of security i, i = 1...n.				
$\gamma_i$ = probability of default/failure of security i, i = 1...n.				
$\sigma_i^2$ = variance of "true" expected returns on security i, i = 1...n.				
$\hat{\sigma}_i^2$ = variance of "observed" expected returns on security i, i = 1...n.				
Variable	Mean	Standard Deviation	Minimum	Maximum
$\beta_i$	0.9182	0.0672	0.7039	1.2117
$\hat{\beta}_i$	0.9137	0.0687	0.6832	1.2113
$\hat{\beta}_i - \beta_i$	-0.0045	0.0113	-0.0619	0.0286
$\gamma_i$	0.0009	0.0016	0.0000	0.0086
$\hat{R}_i$	0.1344	0.0066	0.1129	0.1625
$\bar{R}_i$	0.1180	0.0057	0.0998	0.1430
$\sigma_i^2$	0.0972	0.0495	0.0268	0.2031
$\hat{\sigma}_i^2$	0.0937	0.0482	0.0247	0.1966

## HYPOTHESES AND TESTS AND RESULTS

In order to address the question of how bias in betas is related to firm size, we make the reasonable and well-established assumption that small stocks have a greater probability of default than large stocks. Accordingly, our first hypothesis is that stocks with  $\hat{\beta}_i > \beta_i$  have a low probability of default, and stocks with  $\hat{\beta}_i < \beta_i$  have a high probability of default. We define a dummy variable,  $\delta$ , such that  $\delta = 0$  if the bias,  $\hat{\beta}_i - \beta_i > 0$ , 1 otherwise. Therefore, according to our hypothesis,  $\gamma_i(\delta = 0) < \gamma_i(\delta = 1)$ . We test this hypothesis with a t-test, using all observations for all simulations. We report the results in Table 2. The results provide strong support for the aforementioned hypothesis.

We also conduct this t-test for the stocks generated in each simulation individually, and find that results are qualitatively consistent with those in Table 2.

<b>Table 2: Results on t-test for differences in probability of default between the groups where <math>\delta=0</math> and <math>\delta=1</math>, using observations for all securities generated in all simulations.</b>				
	Mean value of $\gamma_i$	Assumption (method)	t-stat	p-value
$\delta=0$ such that $\hat{\beta}_i - \beta_i > 0$	0.0005	Equal variance (pooled)	-12.55	0.0001
$\delta=1$ such that $\hat{\beta}_i - \beta_i \leq 0$	0.0013	Unequal variance (Satterthwaite)	-14.71	0.0001
Test for equality of variance, F-stat = 3.33, pval = 0.0001				

To provide further evidence, we next test the hypothesis that the bias in beta,  $\hat{\beta}_i - \beta_i$ , is related to the firm's probability of default,  $\gamma_i$ . For this purpose, we run a regression with  $\hat{\beta}_i - \beta_i$  as a dependent variable and  $\gamma_i$  as an independent variable. We expect to find that the greater the  $\gamma_i$ , the lower the  $\hat{\beta}_i$ . More formally stated, we predict a negative relationship between  $\hat{\beta}_i - \beta_i$  and  $\gamma_i$ . We conduct the test for each of the 100 simulations to ensure consistency. The results are reported in Table 3. In an overwhelming number of the market simulations (79 out of 100), we find, as expected, a negative and significant relationship between  $\hat{\beta}_i - \beta_i$  and  $\gamma_i$ . In a few simulations (4 out of 100), the relationship is positive, but not significant. It is noteworthy that in no case, is the relationship between  $\hat{\beta}_i - \beta_i$  and  $\gamma_i$  positive and significant. These simulation regressions and t-tests provide strong support for the hypothesis that betas of small firms are biased downward while those of large firms are biased upward, hence contributing to the empirical observation of the so-called SFE.

In addition to our central results discussed above, we point out some interesting patterns that appear in these simulations. One of these is the weak relationship between  $\gamma_i$  and  $\beta_i$ . Table 4 contains the results of the cross sectional regressions of  $\beta_i$  on  $\gamma_i$  and it turns out that there is not much of a relationship between true betas and the probability of default. A similar pattern appears in Table 5 where we report the results of cross sectional regressions of observed betas ( $\hat{\beta}_i$ ) against the probability of default. A majority of these regressions have coefficients that are not significant, which tells us that neither  $\beta_i$  nor  $\hat{\beta}_i$  are related to the probability of default. Yet, the bias in beta measurement does significantly depend on probability of default ( $\gamma_i$ ) as discussed in Table 3. This is an interesting result and is consistent with a number of empirical studies that find that size and beta are not significantly related to one another.

<b>Table 3: For each of the 100 simulations, the regression <math>(\hat{\beta}_i - \beta_i) = a_0 + b_0 \gamma_i + \varepsilon</math> was performed and the results are summarized below. Significance is measured at the 5 percent level.</b>				
For simulations with $(b_0)$ coefficients that are:	N	R <sup>2</sup>	$a_0$ (p- value)	$b_0$ (p-value)
Negative, not significant	17	0.0362	-0.0025 (0.4073)	-1.919 (0.2892)
Negative, significant	79	0.3116	-0.0008 (0.5588)	-4.080 (0.0077)
Positive, not significant	4	0.0151	-0.002 (0.4064)	2.374 (0.4872)
Total	100	0.0151	-0.001 (0.5270)	-3.455 (0.0747)

<b>Table 4: For each of the 100 simulations, the regression: <math>\beta_i = a_0 + b_0 \gamma_i + \varepsilon</math> was performed and the results are summarized below. Significance is measured at the 5 percent level.</b>				
For simulations with $(b_0)$ coefficients that are:	N	R <sup>2</sup>	$a_0$ (p-value)	$b_0$ (p- value)
Positive, not significant	62	0.0526	0.911 (0.0001)	6.075 (0.3594)
Negative, not significant	10	0.0241	0.896 (0.0001)	-3.687 (0.0108)
Positive, significant	28	0.2752	0.918 (0.0001)	17.64 (0.0108)
Total	100	0.1120	0.912 (0.0001)	8.338 (0.2881)

<b>Table 5: For each of the 100 simulations, the regression: <math>\hat{\beta}_i = a_0 + b_0\gamma_i + \varepsilon</math> was performed and the results are summarized below. Significance is measured at the 5 percent level.</b>				
For simulations with ( $b_0$ ) coefficients that are:	N	R <sup>2</sup>	$a_0$ (p-value)	$b_0$ (p-value)
Positive, not significant	50	0.0384	0.9108 (0.0001)	5.3163 (0.4378)
Negative, not significant	32	0.0168	0.9029 (0.0001)	-2.9119 (0.6197)
Negative, significant	1	0.2816	0.9749 (0.0001)	-17.2652 (0.0044)
Positive, significant	17	0.2515	0.922 (0.0001)	19.5898 (0.0181)
Total	100	0.1120	0.9121 (0.0001)	8.3389 (0.2881)

<b>Table 6: For each of the 100 simulations, the regression <math>\hat{R}_i = a_0 + b_0\hat{\beta}_i + c_0\gamma_i + \varepsilon</math> was performed and the results are summarized below. Significance is measured at the 5 percent level.</b>					
For simulations with ( $c_0$ ) coefficients that are:	N	R <sup>2</sup>	$a_0$ (p-value)	$b_0$ (p-value)	$c_0$ (p-value)
Positive, not significant	6	0.86 70	0.0556 (0.0001)	0.0844 (0.0001)	0.4112 (0.4764)
Positive, significant	94	0.85 23	0.0587 (0.0005)	0.08153 (0.0001)	1.1806 (0.0016)
Total	100	0.85 32	0.0586 (0.0005)	0.0817 (0.0001)	1.134 (0.0301)
Coefficient of beta hat is always positive in the above regressions; including probability of default improves the explanatory power and increases the returns.					

Finally, we also mimic the cross-sectional studies as in Fama and French (1992) by conducting cross-sectional regressions of  $\hat{\beta}_i$  and  $\gamma_i$  on  $\hat{R}_i$ . The results for these regressions are presented in Table 6. As the academic literature has been finding with stock-market data, our simulations indicate that, in the presence of survival bias, an inclusion of  $\gamma_i$  as one of the independent variables improves the explanatory power of the regressions significantly (see Table

7). In our results,  $\gamma_i$  is positively related to expected returns on stocks in 94 regressions out of a 100 regressions.

<b>Table 7: For each of the 100 simulations, the regression <math>\hat{R}_i = a_0 + b_0 \hat{\beta}_i + \varepsilon</math> was performed and the results are summarized below. Significance is measured at the 5 percent level.</b>				
For simulations with ( $b_0$ ) coefficients that are:	N	R <sup>2</sup>	$a_0$ (p-value)	$b_0$ (p-value)
Significant	100	0.694	0.0556 (0.0084)	0.0861 (0.0002)

These results have been obtained in the context of a CAPM mean-variance efficient world and can be explained by the existence of survival bias alone. Therefore, according to our results, the SFE could be an artifact of the way we observe the returns on stocks in the market, and small firms may actually be earning no excess returns. The risk of small stocks may actually be fairly priced in the market, and investors should not invest in small stocks if they are expecting high excess returns.

## CONCLUSION AND IMPLICATIONS

Certainly the simulations above are not an exact replication of the market. However, we have made an attempt to match the moments of the simulation to the moments of the market. An advantage of our approach is that we have been able to isolate the issue of survival bias from the issue of market mean-variance efficiency. In this context, our study casts doubt on the SFE. The simulation results provide strong support for the hypothesis that the SFE could be due to a bias introduced in the dataset by the survival of stocks.

For investors this means they should exercise caution when buying small stocks. It may be true that some portfolios can benefit from this diversification but there is no guarantee that small stocks will outperform larger stocks in the market. The larger excess returns observed on small stocks in various studies may simply be attributed to a measurement error in the dataset. Investors in small stocks will usually experience considerable volatility in returns. They may not, however, be rewarded by higher returns.

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# THE IMPACT OF BUSINESS RESTRUCTURING ON FIRM PERFORMANCE -EVIDENCE FROM PUBLICLY TRADED FIRMS IN CHINA

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## ABSTRACT

*Many publicly traded companies in China underwent significant business restructuring in the last several years to achieve higher operating efficiency and greater growth opportunities. This paper examines the impact restructuring had on the operational aspects of these firms. We used changes in revenue, profit margin, return on assets and the total asset turnover ratio before and after the restructuring as proxies for firm performance and conducted tests to determine whether business restructuring resulted in significant changes. We also examined the stock price reaction to the restructuring announcements. Our study showed that there were significant improvements in total revenue, profit margin, and return on assets following restructurings but there was no evidence of any significant impact on asset turnover ratio. The market reaction to the restructuring announcements was positive and statistically significant. We also found evidence of significant market anticipation and overreaction to the restructuring announcements.*

## INTRODUCTION

For historical reasons, the majority of the publicly traded companies listed on the exchanges in China are in traditional industries such as textile, chemical and machine building. Since the late 1990s, and especially after China's entry into the World Trade Organization, which opened the door much wider for imported foreign goods and services, many of these firms have been faced with declining domestic demand and increasing foreign competition. At the same time, the Chinese Government, concerned about the structure of the antiquated industrial base, made serious efforts to encourage companies in traditional industries to migrate into new industries with greater promises of growth and technological improvement. The 10th Five-Year Plan called for rapid development of financial, communication and information technology industries, while consolidating the

petrochemical, automobile and electronics industries. As a result, many publicly traded companies, most in which the State had a controlling interest, decided to fundamentally restructure their businesses in recent years. They completely withdrew from the business or industry they were in and either entered a new business or industry believed to have better prospects or entered the new business or industry while continuing their existing business. According to published research, 192 listed companies went through restructuring in 1998 and 1999 (Zheng, 2000). Some of these firms were forced by poor financial results or a disappearing market. But, many were proactive and did the fundamental restructuring to seek new growth and profit potentials. Restructuring took place in three different ways: 1) merger and acquisition; 2) purchase of large block of shares in an existing company; 3) building new production facilities. Most of the restructuring companies withdrew from such industries as textile, chemical, machinery and steel where there was either severe competition or excess capacity. The industries they went into were mostly telecommunications, computer hardware or software, network, biotechnology, etc.

The purpose of this paper is to evaluate the impact of restructuring on these firms. As proxies for firm performance, we used revenue, profit margin, return on assets, and asset turnover ratio. We then conducted tests to determine whether business restructuring brought about significant, sustainable, and positive changes in revenue, profit margin, return on assets and the asset turnover in the restructuring firms. We also examined the market reaction to the restructuring announcements by using the conventional market model to estimate the cumulative abnormal returns at, before, and after the announcements.

The results of our study indicate that there are significant short-term improvements in total revenue, profit margin, and return on assets. Restructuring does not seem to have any significant impact on the asset turnover ratio. The market reaction to the announcements is positive and statistically significant. The two-day cumulative abnormal return (CAR) at announcement is about 2% and statistically significant. Moreover, there is a significant increase in stock price before the announcement. The CAR from 30 days before the announcement to 2 days before the announcement is almost 8%, suggesting possible information leakage or market anticipation. So, the 2%, 2-day CAR at the announcement may not reflect the true magnitude of market reaction to the restructuring announcement. On the other hand, the CAR does go down a little bit after announcement. The CAR from 30 days before the announcements to 30 days after the announcements is about 4%, indicating that there might be some market over-reaction to the announcements.

This paper proceeds as follows. Section one provides a literature review on corporate restructuring. Section two presents data, and the empirical methodology. Section three presents and discusses the results. Section four summarizes the study and presents conclusions and implications.

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## LITERATURE REVIEW

Business restructuring is a very common occurrence in the U.S. and around the world. There is a growing but inconclusive body of literature on this issue. Jensen (1993) reports that 35,000 corporate restructurings took place in the U.S. between 1976 and 1990 and the total market value of these firms was \$2.6 trillion. Liebeskind, Opler and Hatefield (1996) study corporate restructurings between 1981 and 1989 and define seven measures of restructures based primarily on whether the firm was continuously in operation in the industry and whether the firm was added to the industry during the study period. Adams and Brock (1988) and Shepherd (1990) argue that the massive corporate restructurings have resulted in reduced industrial efficiency because of higher industrial concentration. Blair, Lane, and Schary (1991) provide evidence that the dollar value of horizontal mergers increased from \$25 billion in 1970-78 to \$261 billion in 1979-87. Bhagat, Shleifer, and Vishny (1990) believe that restructurings are mainly motivated by consolidation and that they would decrease competition. On the other hand, Jensen (1988,1993), Shleifer and Vishny (1992) argue that corporate restructurings serve to enhance market discipline, reduce capacity at both the firm and industry levels, and force the firms to focus on the industries in which they have a competitive advantage. In the long run, therefore, restructuring improves productivity and efficiency.

Internationally, Kang and Shivdasani (1997) study corporate restructuring during performance declines in Japan. Their sample includes 92 corporations that experienced substantial decline in operating performance between 1986 and 1990 and find evidence that the operating performance of these firms did improve following restructuring. Valsan (2001) studies business restructuring in newly privatized Romanian firms and finds that restructuring increases the likelihood of survival. Dohyung (1999) examines the effects of financial and corporate restructuring following the IMF bailout in the late 1990s and concludes that the massive restructuring helped the recovery process and ultimately reduced the unemployment rate in Korea even though the unemployment rate initially rose.

## DATA AND METHODOLOGY

### Sample Selection

Our sample selection process consists of following screens:

- |    |  |
|----|--|
| 1) | The firm started the restructuring process in 1998 or 1999 during which it entered a new industry, such as telecommunications, computer hardware or software, network, or biotechnology. |
|----|--|

2.	The firm's entry into the new business was reported by one of the three major national business media outlets: Shanghai Securities Daily, China Securities Daily, or Security Times.
3.	In cases where a company entered more than one new industry, the first entry is used as the event date.
4.	If a company entered a new industry through investing in an existing firm, the company must have a controlling interest in the firm in which it invested.
5.	The firm had no significant accounting irregularities in recent years.

Seventy-seven (77) firms passed all the screens and formed our test sample. The total sample is then divided into Groups A and B based on the year the restructuring took place. Group A consisted of 32 firms that went through restructuring in 1998. Group B consisted of 45 firms that went through restructuring in 1999. The distribution is reported in Table 1.

<b>Table 1: Distribution of Sample Firms</b>		
Publicly traded firms in China that underwent restructure in 1998 and 1999 and passed the screen process to be in the sample.		
1998 (Group A)	1999 (Group B)	Subtotal
32	45	77

We then conducted two-sample T-tests on annual performance measures of these firms before and after the restructuring to determine whether there was evidence of significant changes in these measures. The performance measures we used were total revenue, profit margin, return on assets and the total asset turnover. For each firm in the sample, we calculated these measures before and after restructuring. As we used two to three years' data to conduct our tests, we also construct a control sample to help us determine whether any of the performance changes over time were really the result of restructuring, or due to changes in the business environment or other confounding events. To be selected for the control sample, a firm had to meet three criteria:

1.	It did no restructuring in recent years.
2.	It is in the same industry as the sample firms.
3.	Its return on equity in 1997 was about the same as that of the sample firm.

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## Estimation of Market Reaction to Firm Announcement

Abnormal returns at announcement are estimated by employing the market model. The coefficients are estimated by using 300 days' return data prior to 2 days before the announcement. In particular, the abnormal return of firm  $k$  at time  $t$  ( $AR_{kt}$ ) is defined as:

$$AR_{kt} = R_{kt} - (\alpha_k + \beta_k R_{mt}), \quad (1)$$

where,

$R_{kt}$  is the observed return of firm  $k$  on day  $t$ .

$R_{mt}$  is the return on the Shanghai A share index on day.

Following Asquith and Mullins (1986) and other researchers, market reaction to firm  $k$ 's announcement is defined as a two-day cumulative abnormal return ( $CAR_k$ ). The two-day CAR is the sum of firm  $k$ 's abnormal returns on day  $t-1$  and day  $t$ . Day  $t$  is the day that the restructuring announcement appeared in any of the three major newspapers listed above. The basic assumption here is that the market immediately reassesses the company following the restructuring announcement and reacts to it. We also calculated the daily abnormal returns from day  $t - 30$  to  $t + 30$  to see whether there is market anticipation and overreaction to the announcements.

## RESULTS

### Total Revenue

Total revenue for Group A, (companies that underwent restructuring in 1998) increased by 24.3% in 1998 and 35.9% in 1999. These results indicate that there was a statistically significant increase in revenue for Group A firms in both the year restructuring took place and the following year. The average change in total revenue for Group B, (companies that underwent restructuring in 1999) was slightly negative in the restructuring year but statistically insignificant. The change for Group B in the year following was positive and statistically significant.

On the whole, our results indicate that there is a statistically significant increase in total revenue following restructuring, either in the year of restructuring or the following year. The increase in revenue is probably generated by investment in the new business. Since some of the firms in our sample completely withdrew from the industry they were in and entered new industry,

the increase in revenue in the restructuring year and the following year does suggest that the restructuring does increase revenues.

The test results using our control sample provide similar findings. The increases in revenue for the control group are not significant in either the year restructuring took place nor the following years. The results on revenue are reported in Table 2.

<b>Table 2: Changes in revenue over the previous year.</b>			
(* = significant at 5% and ** = significant at 1%)			
Group	% of Change Over Previous Year		
	1998	1999	2000
A	24.3*	36.9*	11.6
B		-2.33	20.59*
C	2.31	6.21	3.45

### Profit Margin

We calculated the average changes in profit margin to determine whether restructuring improves the profit margin. The results are reported in Table 3.

<b>Table 3: Changes in profit margin over the previous year.</b>			
(* = significant at 5% and ** = significant at 1%)			
Group	Average Change Over Previous Year		
	1998	1999	2000
A	4.493*	0.585	0.747
B		2.06	2.786
C	-557	-1.027	-0.93

In the restructuring year, profit margins for Group A firms increased by a statistically significant 4.493%. Group B firms' average profit margins increased by 2.06% but the increase is not statistically significant. In the years following the restructuring, there are modest increases in profit margins for both Group A and Group B firms, but the increases are not statistically significant.

The results from the control sample show that profit margin increases were statistically insignificant in the restructuring year, followed by minor declines in the next two years. These results indicate that there is an increase in the profit margin in the restructuring year, but no further increases in subsequent years. The fact that there was no decline in the profit margin following a significant increase shows that restructuring does improve profit margins.

### Return on Assets

We calculate the return on assets of the restructuring firms to see whether there is any significant change after restructuring. The results are reported in Table 4. There is a statistically significant increase in return on assets in both groups in the restructuring year: 11% for Group A and 9% for Group B. The results are even more noteworthy when compared with the results of the control group, which shows a decline in return on assets for the same time period. For Group A, there is a slight decline in the second year, but the decline is not statistically significant and by lesser amount than the control group. These results clearly indicate that restructuring does improve return on assets at least in the restructuring year.

Table 4: Changes in return on assets over the previous year.			
(* = significant at 5% and ** = significant at 1%)			
Group	Average Change Over Previous Year		
	1998	1999	2000
A	11.1*	-1.10	1.687
B		8.98*	1.734
C	-3.65*	-3.77	3.726

### Asset Turnover

We calculated asset turnover ratio to determine whether there is any significant change in asset management efficiency before and after the restructuring.

For Group A, there is a slight but statistically insignificant decrease in asset turnover in the restructuring year. In the year following, there is an increase, but it is statistically insignificant.

For Group B, there is a significant decrease in asset turnover in the restructuring year, but in the year following restructuring, there is an increase, though it is not statistically significant.

The results are reported in Table 5. The results indicate that there is no significant change in the asset turnover ratio before and after restructuring. These findings suggest that restructuring does not significantly improve the restructuring firms' asset management efficiency. The main reason for that, we believe, is that the numerator, the total revenue, may not increase as fast, at least initially, as the value of the total asset due to large investments by these firms.

<b>Table 5: Changes in total asset turnover ratio over the previous year.</b>			
(* = significant at 5% and *** = significant at 1%)			
Group	Average Change Over Previous Year		
	1998	1999	2000
A	-4.53	5.656	-5.674
B		-6.081*	3.28
C	-10.93**	-3.274	1.59

The results from our control sample show that there is a significant decrease in asset turnover in the first year for the control group. This suggests that the insignificant decrease in Group A was probably not caused by restructuring. It may have been caused by some macro economic factors or industry related factors. In fact, restructuring may have reduced the decline somewhat (Group A: -4.53% vs. Control Group: -10.93%). In the year after the restructuring, there was an increase for Group A but the Control Group remained negative. In the second year following the restructuring, the ratio for Group A turned negative but the ratio for Control Group C was positive. What these somewhat conflicting results show, we believe, is that there might be a slight, though statistically insignificant, increase in management efficiency following the restructuring. There is no evidence to suggest that restructuring improves asset turnover ratios.

### **Market Reaction to Restructure Announcements**

The two-day cumulative returns for the whole sample and for each group are positive and statistically significant. The two-day CAR for the whole sample is 2.3%. It is 2.5% for Group A and 2.2% for Group B. All are significantly different from zero, indicating a significant announcement effect. The CAR from day t-30 to t-2 is 5.6% for Group A and 3.2% for Group B, suggesting a statistically significant price run-up before the announcements. This may be due to information leakages or market anticipation. Either way, the significant CARs before the

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announcements undercut the announcement returns. So, the reported announcement CARs may be underestimated. At the same time, we also find that the returns turn negative after the announcements, averaging a 3% drop from the announcement dates to 30 days after the announcements. A possible reason for this is that when investors learn the details of the restructuring and analyze the plans, they are less optimistic about the prospects of the firms and the declining stock price reflects the readjustment.

## CONCLUSION AND IMPLICATIONS

Many publicly traded companies in China underwent business restructuring in recent years to achieve new growth opportunities. We conducted this study to determine whether these restructurings fundamentally improved the firm's operating performance as measured by revenue, profit margin, return on asset, and the asset turnover ratio. We also examined market reaction to the restructuring announcements.

Our results provide evidence that there are significant increases in revenue, profit margin and return on assets following restructuring. We found, however, no evidence to suggest that restructuring significantly changed the asset turnover ratio. The market reaction to the restructuring announcement was positive and statistically significant. The two-day announcement CAR was a little more than 2%. However, this may understate the magnitude of the market reaction because there was a significant increase in stock price days before the announcements, either due to an information leak or market anticipation. At the same time, we also found a significant drop in stock price in the days after the announcements, suggesting a reassessment of the restructuring after the market had a chance to analyze the details. The overall market reaction to restructuring announcements, however, remains significantly positive.

The findings of this paper have important implications. Restructuring clearly paid off for the companies in our sample, resulting in increased revenue, more profit, and higher returns on their assets. Based on results from the control group, it is clear that because of lack of demand and overcapacity in their old lines of business, the sample firms would not have been able to accomplish any of these increases had they not restructured. Restructuring was clearly a good decision for these firms. At the same time, restructuring publicly traded companies may also benefit the whole Chinese economy in two significant ways. 1). Restructuring creates more capacity in the industries where there was a lack of capacity. The new entrants may also increase competition in these industries. 2). Restructuring reduces the excess capacity that existed in the traditional industries. This helps stabilize prices in those industries and enables the remaining firms to improve their financial performance and generate badly needed funds for research and development. So, restructuring not only helps the restructuring firms but also represents a capital reallocation in response to changing market conditions. Such capital reallocation has the potential to improve overall productivity and

provide significant social benefits. The findings of this study contribute to the existing literature by providing evidence that restructuring not only improves the operating performance of the restructuring firms but also helps to reduce excess capacity and improve productivity and efficiency.

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