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FAMILY MATTERS!

AN ANALYSIS OF THE IMPACT OF FOUNDING FAMILY OWNERSHIP ON THE HR PRACTICES OF PUBLICLY TRADED FIRMS

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ABSTRACT

The extant literature on family ownership has shown that founding family owned firms differ from non-founding family owned firms in various strategic and financial dimensions. This paper explores the differences in the human resource practices between founding family owned and non-founding family owned firms. In particular, it looks at the impact of founding family ownership on executive compensation strategies and overall employee pensions on a sample of large, publicly traded S&P 500 firms. Results show that founding family ownership is positively associated with the ratio of base to total compensation of top executives, and pension expenses for all employees. It is also negatively associated with total executive compensation and variance in executive pay. These findings imply that founding family firms' HR policies contribute to their unique characteristics and can enhance their human capital.

Introduction

The extant scholarship on publicly traded founding family-owned firms has revealed the tremendous impact that founding family ownership has on several aspects of firm behavior. It has shown how founding family firms differ from non-founding family firms in their strategic orientation towards diversification, risk, and approaches to debt (Anderson, Mansi & Reeb, 2003; Mishra & McConaughy, 1999; Kang, 2000). The unique characteristic of publicly traded family-owned firms is in the overlap of the manager and the owner – which brings the promise of an exceptional reconciliation of the typical 'agency' problem that has plagued modern corporations for long (Fama & Jensen, 1983). In fact, it is this singularity of family ownership, along with the organic knowledge of the firm possessed by the founding family members that has often been attributed as the primary reason for the superior performance of publicly traded family owned firms (Anderson & Reeb, 2003; Villalonga & Amit, 2006). Within the growing field of founding family literature in management studies, one significant absence has been a systematic exploration of the impact of this form of ownership on the human resource practices (strategies) of the firm. This is important since human resource strategies not only impact firm outcomes

(Becker & Huselid, 2000; Pfeffer, 1995) but are also derived from firm strategies (Lengnick-Hall & Lengnick-Hall, 1988). Studies from an agency theory perspective have often looked at the impact of other forms of ownership such as institutional and blockholding owners on issues of major HR issues such as CEO compensation (David et al, 1998; David & Kochhar, 1996; Khan et al, 2005). Others have examined only certain kinds of ownership in particular contexts, such as the impact of managerial ownership on HR practices in Ukraine (Buck, Filatotchev, Demina & Wright, 2003), or the impact of state versus private ownership on the HR systems in China (Braun & Warner, 2003). However, there is a lack of any systematic study exploring the relationship between founding family ownership and firm human resource policies and discern its differences from non-founding family owned firms.

The lack of understanding of how HR practices differ between founding family firms (FFFs) and non-FFFs is crucial for several reasons. First, a firm's HR practices are a major source of its competitive advantage as they contribute to its unique human capital (Barney, 1991, Pfeffer, 1995, Tsui et al., 1997). Indeed, attracting and retaining talent is crucial for success especially in today's more turbulent environment (Tsui et al., 1997). Second,

many FFFs have a long term orientation and tend to be less diversified than non-FFFs, increasing their need to rely on their unique human capital to survive and succeed.

Specifically, we believe that family ownership would have a strong impact on firm human resource practices due to the long-term orientation of founding family owned firms (James, 1999; De Vries, 1993), their high levels of control of the firms, their personal monetary investment (Anderson & Reeb, 2003), and their psychological involvement in the firm (Wasserman, 2003). Thus, in this paper, we try to explore the differences between founding family owned and non-founding family owned firms in their HR practices. We investigate the differences in their compensation and benefits practices since these HR practices form the highest costs for firms and therefore are a reflection of the strategic decisions taken by the firms (Gomez-Mejia et al, 2004). Here, we study: 1) the differences in executive compensation strategies – particularly the structure of compensation for the top team and the variance in their pay, and 2) the differences in the benefits, especially in pension spending, between founding family owned and non-founding family firms in the context of the large publicly traded S&P 500 firms in the US.

In the next section, we discuss the extant literature on family ownership and compensation. We develop our hypotheses from two key theoretical perspectives – agency theory and the equity theory of compensation. In the following section we discuss the methodology – including the key variables used and the mode of analysis. We then show the results obtained for our hypotheses tests. In the last section, we discuss the results, their implications for managers, the limitations of the current study and the future explorations that can be made from here.

Theory and Hypotheses

Founding family ownership

Approximately 60% of the US GDP is generated by founding family controlled businesses (Bellet, Dunn, Heck, Parady, Powell, & Upton, 1995). Yet, family control or ownership has remained a relatively unexplored area of interest within management scholarship (Litz, 1997). Recently more studies have begun exploring this phenomenon from different perspectives. They have shown that publicly traded founding family firms (FFF) outperform publicly traded non-founding family firms (Villalonga & Amit, 2006; Anderson & Reeb, 2003;

Kang, 2000), may have different risk propensities, and make different strategic choices, especially financial ones (Anderson, Mansi & Reeb, 2003; Dyer, 1986; Fama & Jensen, 1983; Harris, Martinez, & Ward, 1994). Others have used the resource based perspective to show how FFFs have a unique resource called the ‘familiness’ that provides them with a competitive edge over non-family firms (Habbershon, Williams & Kaye, 1999). From a psychological perspective, some scholars have argued that FFFs have different orientations and belief structures (Gersick, Davis, Hampton, & Lansberg, 1997; De Vries, 1993).

FFFs are also characterized by higher under-diversified personal wealth invested in the firm (Anderson & Reeb, 2003) and by the salience of firm identity for family related executives or directors (Gersick, et al., 1997). Further, many such firms are managed to preserve the firm for future generations (James, 1999). Consequently FFFs are considered more long-term oriented than non FFF (Alcorn, 1982; James, 1999; McConaughy, 2000). Similarly, the values and personality of the firm’s founder impacts a firm’s culture and traditions, even after the founder has died (Wasserman, 2003). These characteristics make FFFs stand out in comparison to non-FFF and compel us to explore the interesting possibility that with regard to HR in general, and compensation and benefits in particular, such firms will exhibit unique tendencies. Firms’ HR strategies are an important if not a crucial determinant of their performance and outcomes (Legnick-Hall & Legnick-Hall, 1988). Some suggest that the way that firms manage their human capital can contribute to the firm competitive success (Barney, 1991; Becker & Huselid, 2000). Thus we explore the human resource practices of FFFs to find out how they are different from non-FFFs. Specifically we examine the top management team’s compensation and overall employee benefit compensation. Top management team compensation strongly affects the strategies and performance of firms (Finkelstein & Hambrick, 1988; Gomez-Mejia, Tosi & Hinkin, 1987). Benefit compensation reflects an important aspect of the firm HR philosophy and orientation toward its employees (Tsui et al, 1997). This is especially important now when, in the last decade, pension funding and other forms of benefits, have been reduced/re-trenched by several firms to limit the costs incurred by rising benefits costs (Gomez-Mejia et al, 2004).

Executive compensation

Ownership, compensation and agency theory

The agency framework has largely guided much of the literature on compensation in publicly traded firms – where, typically, there is a clear separation between principals (owners) and agents (managers) (Berle & Means, 1932; Eisenhardt, 1989). This framework suggests that the interests of owners and principals can diverge and thus owners need to monitor the behavior of managers to ensure goal alignment between the contracting parties (Eisenhardt, 1989; Fama & Jensen, 1983). In this context it is usually difficult to directly observe the behavior of managers, therefore monitoring takes place by the use of different pay practices (Jensen & Meckling, 1976), in particular outcome-based pay structures that emphasize performance related compensation. Studies have suggested that large owners, namely institutional owners and concentrated blockholders are efficient monitors and have a strong impact on compensation of their executives, increasing interest alignment (Bushee, 1998; David & Kochhar, 1996; David et al, 1998).

Despite a major focus on different forms of ownership and its implications on managerial compensation, there is a dearth of exploration of the founding family as a form of ownership in publicly traded firms. This is crucial, because as discussed before, founding family controlled firms by definition, seem to mitigate the agency problem by an incentive alignment caused by the overlapping of management and ownership (Fama & Jensen, 1983; James, 1999; McConaughy, 2000). This view has been supported by several studies that have shown that such ownership is positively associated with firm value (Anderson & Reeb, 2003; Kang, 2000), negatively associated with total pay and incentive compensation of family CEOs (McConaughy, 2000), and also negatively associated with firm diversification (Mishra & McConaughy, 1999).

Following the findings of the above studies and the logic of the agency school of thought, we would expect that founding family owned firms would have a larger scope to monitor the behavior of their managers. This is by virtue of two key factors. First, founding family members tend to have more of their personal wealth invested in the firm and this investment represents a less diversified portfolio than for other investors (Anderson & Reeb, 2003; Anderson, Mansi & Reeb, 2003). This motivates them to monitor their investment more actively than other investors. Second, by virtue of their higher invest-

ment and their involvement in the management of the firm, founding family members possess greater knowledge of the firm than other shareholders. This reduces the information asymmetry that leads to monitoring problems (Barney & Hesterley, 1999). This superior monitoring potential should therefore make it superfluous to use other methods of minimizing agency problems – namely incentive compensation (Eisenhardt, 1989; Rediker & Seth, 1995). In particular the ability to monitor agents' behavior directly is a central factor in the decision to use behavioral versus outcome-based contracts (Eisenhardt, 1989). Specifically, as the monitoring potential increases the propensity to use behavioral based contracts (salary based) as opposed to outcome based (incentive compensation) should increase as well (Eisenhardt, 1989). In the context of the top management team the presence of founding family executives, directors or equity holders (Bethel, Liebeskind & Opler, 1998; Carleton, Nelson, & Weisbach, 1998) creates a frequent opportunity to monitor top executive behavior. Since these individuals are members of the founding family they have a vested interest in monitoring the behavior of other top executives in the firm. Therefore, given the unique position of founding family members, we would expect that FFFs to depend more on monitoring than incentive alignment and therefore would use more behavioral based compensation as opposed to outcome based compensation. Thus we propose:

H1a: Founding family firms are positively associated with base compensation and negatively associated with incentive compensation, in comparison to non- founding family firms.

The ease of monitoring (Andersen & Reeb, 2003) in these firms also affects the total compensation of the executives. According to Eisenhardt (1989) and others (Westphal, 1998), monitoring difficulties lead to the increase in the total compensation of the CEOs and the other members of the top management team. Thus, the heightened monitoring effect of founding family ownership should also reduce the total compensation of the executives.

This tendency can also happen because of certain motivational reasons. According to Maslow (1943), compensation is one form of motivation. This is also echoed by March and Simon (1958), when they posit that inducements are a composition of several factors including the culture at work and the pay received. They also assert that firms balance the total inducements, such that low compensation can be used with great working environment and vice versa. According to De Vries (1993), FFFs have corporate cultures that create a “common purpose

for employees to help establish a sense of identification and commitment". Moreover, FFFs are influenced by the personality and values of the founder of the firm, even if that person is no longer alive (Wasserman, 2003). Such influence can impact the culture of the firm and shape its collective identity (Gersick et al., 1997). If this is the case FFFs' employees could exhibit higher levels of identification and commitment with their firm leading to high motivation (O'Reilly & Chatman, 1986). This should apply even more so with regard to top executives since they are more involved in firms' strategic decision making and by virtue of their position interact more with any founding family members. Thus we hypothesize:

- H1b: Founding family firms are negatively associated with total compensation in comparison to non-founding family firms.

Equity aspects of compensation

One key theory that has been employed for understanding employee compensation from the larger perspective of motivation is Equity theory (Adams, 1965). According to this perspective, compensation is motivational when there is a sense of fairness in the pay structure – balancing the level of inputs and outcomes. Freedman and Montari (1986) suggest that the values and goals of the managers who take the decision of compensation in the organization are reflected in the level of equity fairness in pay. They also suggest that managers with long-term orientation in the firm may take decisions to increase motivation and reduce conflict related to pay. Moreover, studies have shown that founding family CEOs get paid less than non-family CEOs (McConaughy, 2000). This resonates the idea that family firms have high levels of incentive alignment with their family members who play an active role in the firm. It also shows that firm compensation is affected by the presence of founding family managers. Studies have also shown that high levels of pay dispersion caused by excessive reliance on individual pay for performance, lead to reduced levels of total performance (Bloom, 1999). As discussed earlier, FFFs have greater investment in, and greater knowledge of the firm they own, and so are more likely to be sensitive to the level of fairness caused by pay dispersion. We therefore propose:

- H2: Founding Family firms are negatively associated with variance in executive compensation.

Benefits

Benefits, in general and pension plans in particular, have not been explored extensively within the field of corporate governance, even though there are several issues that involve firm governance in making decisions over pensions (Hamdallah & Ruland, 1986). Some studies have used agency theory and equated the concept of benefits to base pay, since both of them are not determined by employee performance (Barringer & Milkovich, 1998). Others have looked at pensions from the perspective of accounting (Hamdallah & Ruland, 1986). However, in the human resource management literature, benefits have been viewed as the 'golden handcuffs' that are methods of retaining employees (Gomez-Mejia, et al, 2004). Moreover, there has been an increasing cost of benefits leading firms to often decide to reduce expenses by cutting off pensions, especially defined contribution. Thus firms with higher expenses on pensions should also be the ones looking towards a long-term, somewhat paternalistic relationship with employees (Gomez-Mejia et al, 2004), incurring higher investments in them (Tsui et al, 1997). As discussed previously, the literature on family firms suggest that they have a long-term orientation towards firm processes and a commitment to employee motivation (James, 1999; De Vries, 1993). This coupled with the agency perspective that benefits resemble base compensation rather than equity compensation (Barringer & Milkovich, 1998), we expect that founding family owned firms would have greater reliance on pensions for all their employees. We thus propose:

- H3: Founding Family firms are positively associated with pension funds in comparison to non-family owned firms.

Research Design

Sample

The sample for this study consisted of S & P 500 firms. Due to the exploratory nature of this study we chose to look at a cross section of companies and focused only on one year – the year 2000. In order to compare FFFs to non-FFFs in a comprehensive manner and to generalize our results, we compared FFFs to all other firms in their industry (defined at the two SIC digit level for the most inclusive set of firms). This resulted in a sample of 470 firms out of the S&P 500. The data for this study was collected from the Compustat and ExecuComp databases and the proxy statements of the firms. From the initial sample of 470 an additional 50 firms were dropped due to missing data. Thus, the final sample contained

420 firms. Next we will discuss the measures used in the study starting with the dependent variables.

Dependent variables

Based on EXECUCOMP and COMPUSTAT databases, we created four measures of top management team compensation and one measure for pension expenses. The executive compensation variables are calculated for the top 5 executives in each firm in the sample (all items reported in thousands of dollars, unless stated otherwise).

Ratio of salary to total compensation. This variable measures the ratio of the behavioral based compensation in the total compensation. It is measured as a % and is calculated as the mean value of base managerial salary divided by the mean total current compensation.

Mean Value of Total Compensation. This variable captures the average total compensation paid to the top executives.

Variance in Managerial Salary. This variable measures the level of variance in the base salaries of the 5 highest paid executives. This addresses the equity question.

Variance in Total Compensation. This is the variance in the total compensation paid for the year to the 5 highest paid executives. This also addresses the equity question.

Pension and Retirement Expenses. We measured benefits by taking the pension and retirement benefit expenses from Compustat (in millions of dollars).

Independent variables

In order to define which firms are founding family firms we scanned the proxy statements and corporate histories of firms in our sample to find the presence of either the founder of the firm or his or her family members that are involved in the firm's management (as the CEO, in top management positions or serving on the board of directors of the firm). We also searched for the equity ownership of such founding families. Based on this information and following Anderson & Reeb's (2003) and Gallo's (1998) methodology we created the measure of founding family firms.

Family ownership. This variable captures the actual equity ownership of the firm by the founding family members. For example, the Ford family owns about 40% of the firm's voting stock. We refer to this variable as the founding family equity ownership.

Control Variables

We used a variety of controls that are commonly used in management research. We controlled for size, performance and industry.

Size. Previous studies have linked firm size and CEO compensation (Gomez-Mejia, 1994). We measure size by taking log of number of employees for each firm. This data was taken from Compustat.

Performance. We controlled for performance since it can influence the compensation paid to executives. We used ROA, which is an the accounting measure. It was measured as the firms' after tax earnings divided by their total assets (Sanders, 2001). Data for this variable was taken from Compustat.

Industry. We measured industry effects using two categorical variables. First, we used the two-digit SIC classification. Second, we combined the 4 digit SIC codes to 15 industrial categorizations suggested by Barth et al (1999), thus creating a 14 category dummy code.

Analysis

The hypotheses in this study were tested using OLS regression. In testing all the hypotheses we used a 2 step approach, where in Step 1 the models were run only with the controls, while in Step 2 the family ownership variables were added. This approach helped us identify the magnitude of the effect of the family ownership variables.

Results

Table 1 provides the means, standard deviations and correlations of all the variables. The summary statistics show that on average, 54% of total compensation (SD 0.18) was composed of salary (behavioral based). While the average total salary was a little under \$1 million (\$987,000 with SD 506,480). The average number of employees was around 41,000, which was to expected due to the nature of our sample. The average return on assets for the sample was 5% and family ownership av-

eraged around 3% (SD 8.89). The correlations for the family ownership variable are not that significant. The results of the regression analyses are presented in Table 2 and are discussed in detail next.

1b postulates a negative association between founding family firms and total compensation in comparison to non- founding family firms.

TABLE 1
DESCRIPTIVE STATISTICS AND CORRELATIONS

Variable	Mean	StdDev	1	2	3	4	5	6	7
1. Ratio of salary to total compensation	0.54	0.18	1						
2. Mean total compensation (\$000)	987.67	506.48	-0.707***	1					
3. Variance in managerial salary	55674.09	50931.37	-0.109*	0.437***	1				
4. Variance in total compensation	5.66E+05	1.07E+06	-0.476***	0.627***	0.467***	1			
5. Pension and retirement expenses (\$million)	1.05	200.30	0.043	-0.103*	-0.107*	-0.085†	1		
6. Size (000)	41.89	79.92	-0.089†	0.277***	0.233***	0.194***	-0.017	1	
7. Performance (%)	5.24	5.48	-0.161***	0.061	-0.016	0	0.05	-0.015	1
8. Family Ownership	2.99	8.89	0.05	-0.035	-0.064	-0.072	0.073	0.219***	0.103*

Hypothesis 1a relates to the structure of compensation while hypothesis 1b relates to the level of total compensation. There is support for both these hypotheses in our results. The model for the proportions of salary has a positive significant beta ($\beta=0.095$, $p<.05$), supporting hypothesis 1a that family firms pay more in behavior based compensation. This provides support for our assertion that due to a greater ease of monitoring FFFs find less need for using incentives for goal alignment. Similarly, hypothesis 1b is supported in the total compensation model ($\beta=-0.094$, $p<.05$). hypothesis

Hypothesis 2 postulates a negative association between founding family firms and variance in executive compensation. The results in Table 2 show that founding family equity ownership is negatively associated with the variance in managerial salary and the variance in total compensation. Specifically, founding family equity ownership is negatively associated with variance in managerial salary ($\beta= -.115$, $p<.05$) and total managerial compensation ($\beta= -.122$, $p<.05$). These results suggest greater equity in the pay practices of founding family firms as compared with non-founding family firms.

TABLE 2- RESULTS OF REGRESSION ANALYSIS

	Ratio of salary to Total compensation	Mean total compensation	Variance in managerial salary	Variance in total compensation	Pension and retirement expenses
Step 1					
Intercept	0.000	0.000	0.000	0.000	0.000
Industry					
Size	-0.254***	0.165***	0.029	0.054	0.016
Performance	-0.201***	0.358***	0.282***	0.296***	-0.032
Step 2					
Family ownership	0.095*	-0.094*	-0.115*	-0.122*	0.093†
	Adj-R ²	Adj-R ²	Adj-R ²	Adj-R ²	Adj-R ²
Step1 R ²	0.154	0.122	0.1603	0.100	0.064
Step 2 R ²	0.162	0.129	0.2003	0.112	0.075
ΔR^2	0.0083*	0.0081*	0.0122*	0.013*	0.0078†

†p < .10, *p < .05, **p < .01, ***p < 0.001.

Hypothesis 3 postulates a positive association between founding family firms and pension funds. We had expected to find a higher commitment to employees through higher pension and retirement expenses. As can be seen in Table 2 founding family equity ownership is positively associated with pension and retirement expenses ($\beta = .093$, $p < .10$), thus supporting hypothesis 3. Thus we find support for all our hypotheses.¹

Discussion and Conclusions

The main purpose of this study was to examine the relationship between FFFs and aspects of firm's compensation strategies. Consistent with our predictions, we found that FFFs do impact compensation and benefits strategies, compared to non-FFFs. Specifically, firms in which founding family members own equity tend to rely more on monitoring than on incentive alignment and hence rely on behavioral compensation as opposed to outcome-based compensation in these firms. This monitoring ability of FFFs is further supported by the results showing FFFs to use less total compensation. One interesting and new finding is that FFFs do have less variance in their executive compensation. This result would have potential bearing on studies about top management teams. It also shows that FFFs have higher equity sensitivity than non-FFFs. For the issue of benefits also, we find that FFFs spend more on pension funds, and are therefore exhibit a long-term orientation towards their employees.

Taken together these results provide some evidence that founding family firms do have a unique approach to their compensation practices. The founding family equity ownership measure captures more of the traditional investor-firm where the founding family resembles that of the long-term investor's involvement with firms (Anderson & Reeb, 2003) in their vested interest in such firms as well as their stronger motivation to monitor such firms (e.g., Bushee, 1998, Cox, Brammer, & Millington, 2004, Graves & Waddock, 1994). However, unlike other long-term investors founding family ownership are generally less diversified and hence have greater incentives to monitor the firm (Andersen & Reeb, 2003).

¹ We also used another measure of family firms – Family Control. This variable is a binary variable that represents the active participation of the family members on the board or management of the firm. The results obtained with this as the independent variable revealed similar results as family ownership. Due to lack of additional information added by the variable, and need for brevity, we used only the equity measure for this study. The results for the Family control variable can be provided on request.

Our results provide some support for an agency theory viewpoint of founding family firms. It does appear that family firm ownership can curb compensation that can be seen as potentially reflecting self-interested managerial behavior (Eisenhardt, 1989). Yet there could be a downside to such curbing as other firms in the same industry might offer better compensatory packages and try to lure talented managers away. However, FFFs also have other motivational factors that could prevent such a turnover, like the culture of identification with the firm and the owners, the long term security, fairness in pay and also the higher levels of benefits.

With regard to pension plans and non-executive employees we find that pension expenses were associated with founding family firms. The positive association of founding family equity ownership on pension plan expenses could indicate that founding family firms long-term orientation translates in the way they view their employees and thus would want to bond them with the firm by spending more on pension funds. This could also reflect Tsui et al, (1997) finding that investing in employees results in better attitudinal outcomes and can maintain employees in a firm.

Limitations

There are several limitations of the current study. Overcoming these limitations would lead to better conclusions about the differences that family ownership and/or control would make. The first limitation of the study is that we could not compare the compensation of non-executive personnel. This is because there is publicly available data for only the top management team and not the others. Second, our study is limited only to an exploration of one form of benefit. Third, this is a cross sectional study, a more longitudinal analysis may provide us with stronger and better insights. Fourth, due to data availability issues we focused only on S & P 500 firms, this limits the generalizability of our findings.

We also acknowledge the fact that our statistical effect sizes in our regressions are not large, yet they are significant. These modest effect sizes indicate that while FFFs do exhibit unique HR policies compared to non-FFFs they too are impacted by their industry and institutional norms (i.e., Dimaggio & Powell, 1983). In other words while we contend that FFFs are characterized by a greater understanding of the importance of their human capital (due to their long term orientation) we realize that HR practices are still strongly impacted by existing societal and industrial norms (Gomez-Mejia et al., 2004). For example employees' compensation is mainly determined by occupational expectations as well

as demand and supply. Thus while FFFs are unique with regard to some of their HR practices they too must conform, to some degree with external pressures and norms. This does not reduce FFFs uniqueness but rather sets an institutional boundary for it. Moreover, it is important to note that the issue of equity has not been extensively examined in the context of executive compensation, thus it is interesting and revealing that FFFs are more aware of this issue.

Future directions

There is a general dearth of literature on issues related to family firms (Litz, 1997). Thus our study makes a significant first step towards analyzing the role of family as a form of ownership for employment practices in the firm. There are several directions that this work can be expanded. One exploration is to dig deep into these organizations to understand their policies on recruitment, training, and performance management. The other possible direction is to explore the non-executive and executive compensation and benefits to check how the firms follow either more egalitarian or more elitist pay policies (Gomez-Mejia et al, 2004). Another potential extension is to explore non-publicly traded firms, which are completely family owned and controlled. Anecdotal data often suggest that they tend to be better employers than others. Similarly, there can be comparisons made across the HR practices between family owned and controlled firms across different countries as the meaning of ownership may be relative to the cultural attributes of the people.

Conclusions

In this study, we address a specific absence within both the literature of corporate governance and human resources. Our results provide preliminary support to the hypothesis that there are significant differences in the structure and thereby the culture promoted by these publicly traded FFFs as compared to other publicly traded firms. Thus, we consider this to be a contribution to the above mentioned research streams in showing that founding family owners, and not just the managers of the firm affect the nature of employment practices of the firm.

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THE BREAKEVEN INFLATION RATE

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ABSTRACT

The breakeven inflation rate refers to the difference between the nominal yield on a conventional bond and the real yield on an inflation-indexed bond of the same maturity. It has been used extensively as a tool to obtain the expected inflation. Since the introduction of Treasury Inflation-Protected Securities (known as TIPS) in 1997, many studies have been done by utilizing this newly available proxy for real interest rate. The current study derives the nominal and real interest rate term structure by using trading prices of Treasury STRIPS and TIPS with constant maturities. The breakeven inflation rate is then compared to the inflation expectation survey data published by the Federal Reserve Bank at Philadelphia. Although breakeven inflation rates are constantly lower than the mean expected inflation during the early period, they are well within the maximum and minimum boundaries of expectations from the professionals. Empirical evidence suggests that investors are pessimistic and tend to overestimate future inflations.

Introduction

According to the traditional Fisher (1930) equation, expected future inflation is represented by the difference between *ex ante* nominal and real interest rates. In a world with uncertain inflation, the nominal rate of return incorporates the real rate, expected inflation, and an inflation risk premium, which compensates investors for bearing the risk of inflation. Investors' confidence in monetary authorities as well as the credibility of policy-maker actions in the marketplace will affect the amount of the inflation risk premium. The greater the inflation risk, the higher the inflation risk premium should be.

Empirical studies provide mixed results regarding the size of the inflation risk premium. In general, historical estimates vary from 0 to 250 basis points in the U.S. and the U.K. Some suggest a zero inflation risk premium, while others believe the inflation risk premium is significant and sizable. Evans (1998) documents that the inflation risk premium in the U.K market varies over time, and that it is proportional to the spread between nominal and real interest rates.

Many studies used index-linked gilt data from the U.K. since the *ex ante* real interest rate in the U.S. was unobservable before the introduction of TIPS. Country-spe-

cific characteristics mean that an inflation risk premium in the U.S. and U.K. are likely to behave differently. The size and significance of inflation risk premium depend crucially on the behavior of inflation within a country. Surprises in inflation—difference between expected inflation and realized inflation—play a more important role in determining the extent of inflation risk premiums than the level of inflation itself.

Since the introduction of TIPS in 1997, the *ex ante* real interest rate becomes measurable. By linking value to the Consumer Price Index (CPI), TIPS provide investors with a "real" rate of return. It can be viewed as one of the safest financial assets due to its minimal exposure to default risk and inflation risk. However, one feature of the TIPS that impedes its use as a perfect measure of the *ex ante* real rate is its indexing procedure.

The Bureau of Labor Statistics compiles and publishes the monthly Consumer Price index independent of the Treasury. In order to track inflation movements on a daily basis, hence, adjusting TIPS trading prices accordingly, daily reference CPI is being calculated using a linear interpolation of the most recent two monthly CPIs. Because of this design, there's a built-in three-month lag on TIPS prices. Consequently, TIPS prices don't di-

rectly reflect the real interest rate movement, therefore, adjustments are needed.

The current study derives the nominal and TIPS interest rate term structures using trading prices of Treasury STRIPS and TIPS. The single-factor Cox, Ingersoll, and Ross (1985) model and a two-factor model by Bakshi et al. (2006) are applied to estimate the TIPS and nominal spot rates with constant maturities, respectively. The real term structure is obtained by adjusting for the three-month lag effect following Evans (1998) method. When compared with the inflation expectation survey data, the nominal-real yield spreads are constantly below the mean expectations. This study suggests that the lower than average spreads were not affected by the inflation risk premium or the liquidity risk premium. Instead, people are pessimistic about future outlook and overestimate the inflations.

The rest of the paper is organized as follows. Section II is the literature review. Section III presents data and methodology. Section IV discusses the empirical results and Section V concludes.

Literature Review

Fisher (1930) hypothesizes that the nominal interest rate consists of the expected real rate of interest and expected inflation. The Fisher link, the connection of *ex ante* real rate and *ex ante* nominal rate, is central to the transmission of information about future inflation. In a competitive market, real rates and nominal rates must be set by markets so that the spread summarizes information about expected inflation rate and possibly the inflation risk premium. If the spread is wider than inflation expectations would indicate, there will be an arbitrage opportunity resulting in adjustment of interest rates.

Many empirical studies investigate the relationship of nominal interest rates and the expected inflation rate, called the Fisher effect. These tests have been carried out in the absence of an observable expected inflation rate, for which proxies are used. In a recent study, Chu et al. (2003) extracts *ex ante* real rates using TIPS trading prices. Their results indicate that the nominal and real interest rates are cointegrated. In other words, the nominal-real yield spreads include expected inflation and the inflation risk premium in a world with uncertainty.

Fifteen countries around the world have issued inflation-indexed securities, and studies related to them have been carried out since the 1980s. Since the U.K. has

the largest index-linked bond market, great interest has been concentrated in this market. Chu et al. (1995) investigate the extent and the significance of the inflation risk premium by applying data from index-linked gilts traded in the U.K. Their findings show that the average inflation risk premium is significantly greater than zero at the 1 percent confidence level. The annualized inflation risk premium is about 241 basis points. They conclude that the size and significance of the inflation risk premium indicates investors' willingness to accept a lower real return on gilts when they recognize that both nominal bonds and equity assets are poor hedges against inflation.

Shen (1998) also documents a significant and sizable inflation risk premium in the U.K. nominal government bond market. Shen subtracts the yields of index-linked gilts from the yields of nominal bonds, and compares this difference with expected inflation according to survey results. The inflation risk premium for 20-year nominal bonds averages about 1.0 to 1.6 percent for 1996 ~ 1997. The amount of the inflation risk premium increases with time to maturity. Furthermore, he demonstrates that information on the inflation risk premium provides useful insights for monetary policymakers.

Sack (2000) derives inflation expectations from nominal and Treasury Inflation-Protected Securities (TIPS) yields. He creates a portfolio of Treasury STRIPS that replicates the exact cash flow pattern of a TIPS to obtain a market-based measure of inflation expectations with the assumption of a zero inflation risk premium. The estimated inflation expectations from Sack (2000) are not only quite different from those obtained in a survey, but also more volatile.¹ In a related study, Emmons (2000) suggests that the long-term inflation risk premiums embodied in U.S. nominal Treasury yields are at the lower end of historical estimates.

Shen and Corning (2002) analyze how well TIPS yields can help to identify long-term inflation expectations. They suggest that when investors care about more than just the expected real yields, there might be an inflation risk premium and a liquidity risk premium. They also show that the spread between the yields of nominal and TIPS securities could be higher or lower than inflation expectations, depending on whether the inflation risk premium is higher or lower than the liquidity risk premium. Whether the nominal-real yield spread indicates investors expected inflation becomes an empirical issue.

1 Sack (2000) did not address the three-month indexing lag of TIPS and the declining maturities of the securities.

Data and Methodology

Nominal-Real Yield Spread

The nominal and TIPS term structures are estimated based on Treasury STRIPS and TIPS daily trading prices obtained from the Datastream database. 632 daily prices are collected for the period from April 8, 1999 to September 7, 2001. April 8, 1999 is the first day with six TIPS issues outstanding, and the study period ends on September 7, 2001 to avoid any possible structural break due to the terrorist attack. We also extend the study period in the last part of this paper to see how breakeven inflation rates evolve over time compare to long-term professional expected inflation.

The nominal term structure of interest rate is estimated using a two-factor model derived by Bakshi et al. (2006). The two-factor model allows the instantaneous spot rate and the long-run mean of the short-term rate to evolve stochastically. For each observation day, we employ a robust estimation method to estimate the term structure of nominal interest rates. The objective of our estimation is to minimize root mean-squared weighted percentage pricing errors:

$$\underset{\{z, k_r, \sigma_r, k_z, \mu_z, \sigma_z, \rho_{r,z}, r\}}{\text{Minimize}} \sqrt{\frac{1}{N} \sum_{n=1}^N w_n^2 \left(\frac{\bar{B}(\tau_n) - B(\tau_n)}{\bar{B}(\tau_n)} \right)^2} \quad (1)$$

subject to: $B(\tau) = \exp[-\alpha(\tau) - \beta(\tau)r - \gamma(\tau)z]$

$$\alpha(\tau) = -\frac{1}{2}\sigma_r^2 \int_0^\tau \beta^2(s)ds - \frac{1}{2}\sigma_z^2 \int_0^\tau \gamma^2(s)ds + k_z \mu_z \int_0^\tau \gamma(s)ds - \rho_{r,z} \sigma_r \sigma_z \int_0^\tau \beta(s)\gamma(s)ds$$

$$\beta(\tau) = \frac{1 - \exp(-k_r \tau)}{k_r}$$

$$\gamma(\tau) = \frac{1 - \exp(-k_z \tau)}{k_z} + \frac{\exp(-k_z \tau) - \exp(-k_r \tau)}{k_z - k_r}$$

where $\{z, k_r, \sigma_r, k_z, \mu_z, \sigma_z, \rho_{r,z}, r\}$ are the parameters to be estimated; r and z are the short-term rate and the long-run mean of the short rate, respectively; $\rho_{r,z}$ is the correlation between the two standard Brownian motions for the spot rate and the long-term mean of the spot rate; k_r and k_z are the rates of mean reversion; σ_r and σ_z are constant-diffusion coefficients in the two stochastic processes; and μ_z is the mean for z . We use w_n to represent the weight assigned to security n . $\bar{B}(\tau_n)$ is the market ask price for the n -th STRIPS with τ_n years to maturity, and $B(\tau_n)$ is the model price specified by the two-factor model for the corresponding STRIPS.

The single-factor CIR model is used to estimate the term structure of interest rates for TIPS.² The estimation of the TIPS term structure of interest rates aims to minimize the root mean-squared percentage pricing errors between the observed TIPS price and the price suggested by the single-factor CIR model.

The optimization model is summarized as follows:

$$\underset{\{\phi_1, \phi_2, \phi_3, r\}}{\text{Minimize}} \sqrt{\frac{1}{N} \sum_{n=1}^N \left(\frac{\bar{B}_n^+ - B_n^+}{\bar{B}_n^+} \right)^2} \quad (2)$$

subject to:

$$B_n^+ = \sum_{j=1}^{J_n} C_n(s_j) d(s_j)$$

$$d(s) = e^{4s(\ln \bar{B}(0.25))} \quad \text{if } s \leq 0.25$$

$$d(s) = \bar{B}(0.25) a(s - 0.25) e^{-b(s - 0.25)r} \quad \text{if } s > 0.25$$

$$a(\tau) = \left[\frac{\phi_1 e^{\phi_2 \tau}}{\phi_2 (e^{\phi_1 \tau} - 1) + \phi_1} \right]^{\phi_3}$$

$$b(\tau) = \frac{e^{\phi_1 \tau} - 1}{\phi_2 (e^{\phi_1 \tau} - 1) + \phi_1}$$

where $\{\phi_1, \phi_2, \phi_3, r\}$ are the parameters to be estimated. N represents the number of TIPS in a specific day, J_n is the number of coupon or principal payments associated with the n -th security, and $C_n(s_j)$ is the real cash flows for the n -th bond occurring at time s_j . $a(\tau)$ and $b(\tau)$ are functions of the time span τ and $d(s)$ is the discount factor for one real dollar with elapsed time of s . \bar{B}_n^+ is the market real price for the n -th inflation-indexed bond, and B_n^+ is the real price suggested by the one-factor CIR model for the corresponding security.

Under continuous compounding, term structures of nominal and real interest rates are derived with constant times to maturity.³ We investigate the nominal-real yield spread for constant maturities of 5, 10, 15, 20, and 25 years, which should represent a close estimation of inflation expectations.

Expected Inflation

We collect ten-year inflation expectations survey data from the Federal Reserve Bank at Philadelphia. The Philadelphia Fed maintains this oldest quarterly survey

2 Brown and Schaefer (1994) apply the CIR model to British government index-linked gilt prices. They find that the CIR model provides a flexible fit for the term structure of real interest rates. Furthermore, the small sample size of TIPS prices on each observation date rules out using the more general two-factor model.

3 With parameter estimates from the single-factor CIR model, TIPS spot rates are derived under continuous compounding. The three-month indexing lag of TIPS is being adjusted following Evans (1998) method to obtain the real spot rate with constant maturities. Please see Chu et al. (2003) for detailed discussion.

of macroeconomic series in the U.S.⁴ Each quarter, a small group of professional individuals are surveyed and their beliefs about future inflation rates are gathered. The Federal Reserve Bank at Philadelphia collects these data and reports the mean value as the market expectation for future inflation. During our two-year study period (1999: 2nd quarter–2001: 3rd quarter), long-term expected inflation rates are quite stable. The quarterly expectations for the 10-year inflation rate vary from 2.41 percent to 2.68 percent. By assuming constant future inflation, we derive inflation expectations for 5, 15, 20, and 25 years. In other words, we assume that the average annual future inflation is constant across time periods.

Each quarter, the survey provides inflation forecasts for one-year, two-year, and ten-year periods. We follow a similar procedure used by Shen (1998). By assuming constant future inflation, we express the expected five-year and ten-year inflation as:

$$\pi_5^e = \frac{1}{5}(\pi_1^e + \pi_2^e + 3\hat{\pi}) \quad (3)$$

$$\pi_{10}^e = \frac{1}{10}(\pi_1^e + \pi_2^e + 8\hat{\pi}) \quad (4)$$

where π^e represents the expected rate of inflation, and $\hat{\pi}$ is the constant future annual inflation rate. We first solve equation (4) for $\hat{\pi}$ and then apply this value to equation (3). Following the same procedure, we calculate the expected rate of inflation for different time periods.

Empirical Results

Table 1 presents summary information of inflation expectations for different time span. Except for the five-year expectation, survey data for expected inflation from 10 through 25 years show a high degree of consistency. Standard deviations are around 8 basis points. The mean value of expected inflation first increases from the 5- to 10-year period, and then declines from the 10- to 25-year period.

Table 2 presents summary statistics for the nominal-real spot rate spread with constant maturities. The spreads are more volatile than the survey inflation expectations during the same time frame. This finding is consistent with Sack (2000). The five-year spread has the highest

standard deviation, and standard deviations decline as we move to longer maturities. The mean value of the spreads between the nominal and real spot rates increases from 5 to 20 years and then drops from 20 to 25 years.

The Federal Reserve Bank of Philadelphia also reports minimum and maximum values in its survey report that allows us to compare the spreads with the expectation band created by the maximum and minimum survey results. We calculate the quarterly average spreads from daily observations. Comparisons of 10- and 20-year spreads and inflation expectations are plotted in Figure 1.⁵ Although the spreads are consistently below the mean value of expected inflation rates for the particular periods, the spread between nominal and real spot rates consistently falls within the range of the maximum and minimum expected inflation rates.

One possible explanation for this phenomenon is that inflation expectations of practitioners are too high. Survey data have been criticized for their unreliability, and these values may not be representative. When we compare ten-year inflation expectations in 1991 with the actually realized ten-year inflation, we find the expectations are much higher. Given recent inflation history, together with stable expected long-term inflation rates obtained from the survey data, we suggest that the inflation risk premium in the U.S. is marginal.

Figure 2 plots the expected rate of inflation derived from the nominal and real spot rate time series. The expected inflation is higher for longer maturities most of the time while the three series do converge around the first half of 2000. In other words, during the first half of 2000, the expected inflation on 5-year, 10-year, and 20-years are roughly the same.

There is another reason the spread may be lower than the mean survey data. TIPS is a new type of security with a very short trading history. The significant differences in the trading volumes of conventional Treasury securities and TIPS may complicate the relationship. Some authors suggest there might be a liquidity risk premium in the TIPS yield, which makes this a noisy measurement of inflation expectation. The effort to quantify a liquidity risk premium has been in vain, due to a short trading history and limited issues outstanding.

Shen and Corning (2002) compare yields of the most active ten-year conventional and TIPS notes to measure

⁴ The survey was started in 1968 by the American Statistical Association and the National Bureau of Economic Research. It is also known as the Livingston Survey. The Federal Reserve Bank of Philadelphia took over the survey in 1990.

⁵ Comparisons of 15- and 25-year spreads are available upon request.

the nominal-real yield spread which may incorporate many idiosyncratic factors. Their finding suggests that the liquidity risk premium is higher than the inflation risk premium during the period under investigation. In a comparison of the ratio of the trading volume of TIPS and conventional Treasuries with the yield spread, they show that the low point of the spread during the 1998 market crisis coincides with the low point in trading volume for the same period. Consequently, they suggest that the ratio of trading volumes can be used as an indicator of the liquidity risk premium. Since trading volume varies over time, liquidity risk premiums on TIPS also should vary over time.

We do not find a pattern like Shen and Corning's when we compare the ratios of trading volumes and the breakeven inflation rates. From April 1999 through September 2001, the ten-year spread is relatively stable. There is a downward trend in the spread after May 2000. The ratios of trading volumes, however, are highly variable, and there is a significant increase in TIPS trading after May 2000.⁶ Our findings are not consistent with Shen and Corning's results.

Given the highly variable trading volume and a stable long-term spread between nominal and real spot rates, we conjecture that the liquidity risk premium impounded in TIPS prices does not have a significant effect on the estimation of expected inflation. Even though there may be a liquidity risk premium, spreads do not move according to trading activities. Short-term variations in the nominal-real spot rate spread might be affected by trading activities and market conditions, but the long-term spot rate spread should be affected less by these factors and represents instead more economic activities.

We also extend the study period to the second quarter of 2007 and examine the relationship between breakeven inflation rates and professionals' expectations over time. Survey results for the long-term expected inflation are presented in Table 3. We reported the mean, minimum, maximum, median, standard deviation, and the number of professionals surveyed for each quarter in the table. The median expected 10-year inflation stays stable around 2.5% with a maximum and a minimum mean value of 6% and 3%, respectively. During the eight-year period, Figure 3 shows that breakeven inflation rates fall constantly within the maximum and minimum boundaries of survey data. However, the differences between the mean survey data and the breakeven inflation rate narrow significantly after the third quarter of 2003. It

indicates that the market perception of expected inflation converges to the survey data from professionals, which also leads us to the conclusion that inflation risk premium is insignificant in the US market during the study period.

Summary

The traditional Fisher equation states that the spread between *ex ante* nominal and real interest rates represents the market's expectations of future inflation. With uncertain inflation and market imperfections, the relationship may be complicated by the presence of inflation risk and liquidity risk premiums. Although we are unable to directly test inflation risk and liquidity risk premiums because of the limited trading history of TIPS, the survey data we have and trading activities in the markets imply that these inflation premiums have marginal effects on long-term interest rates. It is reasonable to assume that the spread of long-term nominal and real *ex ante* interest rates represents the market expectations of long-term future inflation.

As time goes by, we will be able to quantify the inflation risk premium and the liquidity risk premium from nominal and TIPS securities when more data become available. Meanwhile, we can confirm the trend observed in breakeven inflation rate is consistent with the inflation expectation survey data.

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⁶ For trading volume ratios of Treasury Inflation Indexed bonds and conventional Treasuries, see Shen and Corning (2002), p74.

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TABLE 1 QUARTERLY SURVEY DATA FOR EXPECTED FUTURE INFLATION 2ND QUARTER OF 1999 THROUGH THE 3RD QUARTER OF 2001					
	5 year	10 year	15 year	20 year	25 year
1999					
Q2	1.450	2.434	2.454	2.463	2.469
Q3	1.488	2.504	2.517	2.523	2.527
Q4	1.525	2.405	2.397	2.393	2.391
2000					
Q1	1.538	2.506	2.502	2.501	2.499
Q2	2.225	2.677	2.658	2.649	2.644
Q3	2.113	2.531	2.488	2.466	2.453
Q4	2.113	2.582	2.543	2.524	2.512
2001					
Q1	1.725	2.525	2.535	2.541	2.544
Q2	2.038	2.612	2.601	2.595	2.591
Q3	2.025	2.577	2.554	2.543	2.536
Mean	1.824	2.535	2.525	2.520	2.517
SD	0.307	0.081	0.073	0.071	0.071
Min	1.450	2.405	2.397	2.393	2.391
Max	2.225	2.677	2.658	2.649	2.644

TABLE 2 DAILY BREAKEVEN INFLATION RATE WITH CONSTANT MATURITIES APRIL 8, 1999–SEPTEMBER 7, 2001					
	5 year	10 year	15 year	20 year	25 year
Mean	1.795	2.038	2.238	2.275	2.151
SD	0.334	0.244	0.196	0.185	0.168
Max	2.560	2.615	2.649	2.731	2.620
Min	0.689	1.286	1.714	1.907	1.747

Shen, P., & Corning, J. (2002). Can TIPS help identify long-term inflation expectations? *Federal Reserve Bank of Kansas City Economic Review*, 86 (4), 61-87.

TABLE 3 QUARTERLY SURVEY DATA ON 10-YEAR EXPECTED INFLATION						
	Min	Mean	Max	Mid	S.D.	N
1999						
Q2	1.200	2.434	3.500	2.500	0.472	34
Q3	1.200	2.504	3.500	2.500	0.425	35
Q4	1.200	2.405	3.500	2.500	0.410	40
2000						
Q1	1.200	2.506	3.500	2.500	0.453	34
Q2	2.000	2.677	4.500	2.500	0.466	30
Q3	1.800	2.531	3.500	2.500	0.430	31
Q4	1.800	2.582	3.500	2.500	0.403	33
2001						
Q1	1.500	2.525	3.500	2.500	0.410	34
Q2	1.800	2.612	4.000	2.500	0.441	29
Q3	1.750	2.577	3.500	2.500	0.393	30
Q4	1.500	2.520	3.100	2.550	0.417	26
2002						
Q1	1.800	2.589	3.500	2.500	0.377	33
Q2	2.000	2.546	3.500	2.500	0.316	34
Q3	1.750	2.544	3.500	2.500	0.306	32
Q4	1.750	2.386	3.500	2.450	0.358	28
2003						
Q1	1.750	2.474	3.000	2.500	0.289	34
Q2	1.750	2.464	3.500	2.500	0.360	33
Q3	1.750	2.459	3.000	2.500	0.322	27
Q4	1.500	2.457	3.500	2.500	0.391	31
2004						
Q1	1.500	2.420	3.000	2.500	0.383	27
Q2	1.750	2.506	3.100	2.500	0.353	25
Q3	1.750	2.513	3.000	2.500	0.327	20
Q4	1.750	2.500	3.000	2.500	0.290	25
2005						
Q1	1.750	2.495	4.500	2.450	0.435	33
Q2	1.750	2.523	4.000	2.500	0.366	45
Q3	2.000	2.701	6.000	2.500	0.673	37
Q4	1.750	2.533	3.500	2.500	0.331	31
2006						
Q1	1.750	2.512	3.700	2.500	0.354	49
Q2	1.750	2.505	3.500	2.500	0.381	32
Q3	1.750	2.630	4.650	2.500	0.550	48
Q4	1.750	2.580	4.550	2.500	0.490	46
2007						
Q1	1.690	2.410	4.000	2.350	0.400	46
Q2	1.800	2.470	4.000	2.400	0.450	49

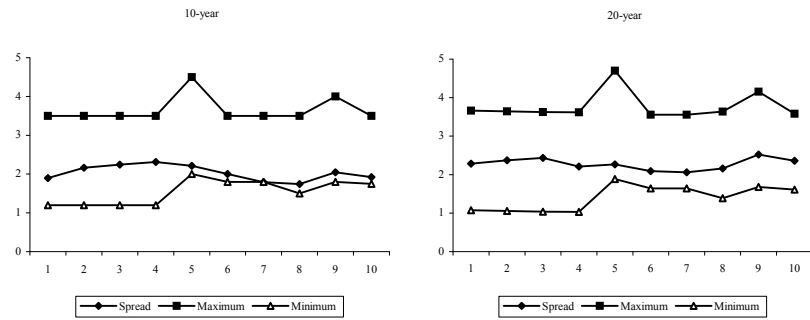


Figure 1
The Breakeven Inflation Rate and Inflation Expectation Survey
1999 Q2 – 2001 Q3

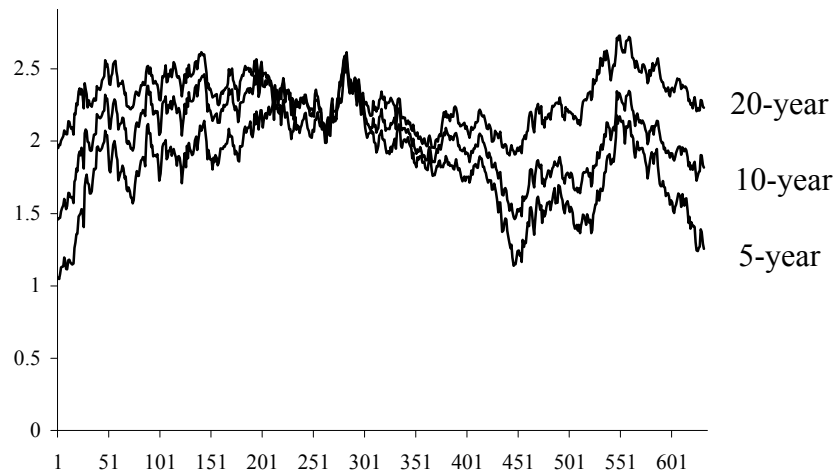


Figure 2
The Breakeven Inflation Rate Derived from the
TIPS and Nominal Yield Curve

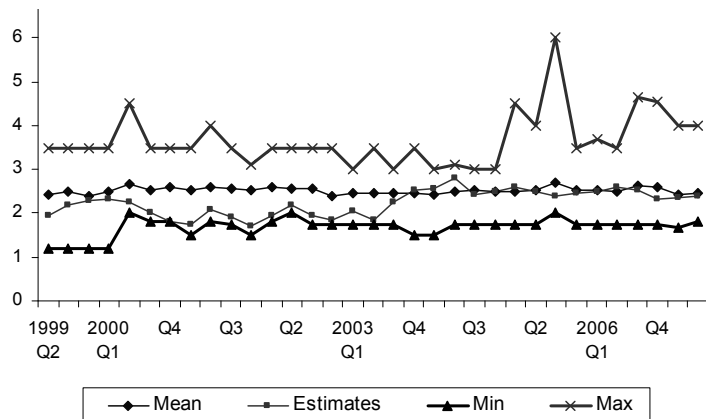


Figure3
The Breakeven Inflation Rate and Inflation Expectation Survey
1999 Q2 – 2007 Q2

ETHICAL BUSINESS DECISION-MAKING: A COMPREHENSIVE VALIDATION OF FORSYTH'S ETHICS POSITION QUESTIONNAIRE

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ABSTRACT

The topic of ethical decision-making is of acute interest in the business world. One tool that was developed in the early 1980's to help measure and understand the dynamics of ethical decision-making was Forsyth's Ethics Position Questionnaire (EPQ). There are two constructs purportedly measured by the EPQ – Idealism, which basically posits that individuals are driven in their ethical decision-making by moral absolutes, and Relativism, which says that ethical decision-making is dependent upon context (i.e., there are no moral absolutes). The purpose of this paper is to conduct a comprehensive statistical validation of the EPQ. To do so, we administered the EPQ to a sample of students at a mid-sized public university in the mid-South. The results of a correlation analysis indicated that the notions of Idealism and Relativism are indeed separate and distinct constructs. A Factor Analysis also confirmed that the EPQ consists of questions that do segregate statistically into the two groups of Idealism and Relativism. A Cluster Analysis further confirmed that the participants did cluster along these same two parameters, and finally a Discriminant Analysis indicated that group membership (Idealist versus Relativist) could be accurately predicted using the EPQ. Our over-all conclusion is that the EPQ is a strong instrument for measuring and predicting individual distinction in terms of being an Idealist or a Relativist.

Introduction

In recent years there have been a number of major business frauds (e.g., Enron, Worldcom, Tyco, Adelphia, Health South, et. al.). Given that it is people that run businesses, it is therefore obvious that it is individual people that ultimately structured and orchestrated these and other frauds. Consequently, the business community is very interested in the area of business ethics in general, and in particular, how the individual person goes about processing ethical decision-making.

The study of personal ethics is one of complexities and often of disagreement among researchers because of inconsistencies in study findings. Early research tried to predict moral behaviors from moral values but results did not indicate significant relationship between the two constructs (Hartshorne & May, 1928). One of the methodological problems was the disagreement between people in deciding what was considered moral and immoral. Researchers were focusing more on the act instead of the person rating the acts. For example, researchers would ask the question, "Is abortion moral?" without considering whether one was old or young, male or female.

Researchers in this area now generally agree that to study ethical behaviors one must study individual differences. Gilligan (1982) believed that females tend to behave in such a way that few people got hurt but males stressed a more rational principle. She studied the concept of ethics of caring. Kohlberg (1981) focused on the idea of social justice and how that shaped moral development.

Schlenker and Forsyth (1977) reasoned that these individual differences in morality could be explained by understanding two simple factors. The first factor was the degree in which one accepts or rejects the idea of universal moral rules and the second factor was related to the outcome of a decision and how others may be affected. In 1980, Forsyth, using a survey he called the Ethics Position Questionnaire (EPQ), redefined the general idea of moral values into a more specific concept called moral philosophies based on these two factors which he related back to Relativism and Idealism, respectively. According to Forsyth, people high on Relativism do not believe in moral absolutes but examine situations on a relative basis. Individuals high on Idealism believe that moral actions should have positive consequences and do not believe that others should be harmed in the pursuit of a goal. Less idealistic individuals believe that some-

times other people may get harmed in the pursuit of a greater good (Forsyth, 1992).

The purpose of this paper is to validate Forsyth's 1980 EPQ using various statistical tests, including Factor, Cluster, and Discriminant Analysis. Forsyth (1980) stated that Relativism and Idealism are two distinct constructs and should not correlate with one another, either negatively or positively. Therefore, it is hypothesized that i

Idealism and Relativism would not correlate but should be two separate factors. It is also hypothesized that if the EPQ measures individual philosophies, then the two constructs, Idealism and Relativism, should, via a Factor Analysis, factor out and the questions within each dimension should be highly correlated with one another. If the two constructs of Idealism and Relativism are indeed valid and individual subjects can be designated as such via some sort of measuring device, then a Cluster Analysis should group subjects by those two parameters and in approximately the same proportions as observed in the sample. Finally, if the Factor and Cluster Analyses work out as hypothesized, then a Discriminant Analysis of the same data should predict group membership (Idealistic versus Relativistic) with a high degree of accuracy. This paper conducts all three of these techniques on our sample data.

Accordingly, the remainder of the paper is organized as follows. The second section of this paper presents the data and the methodologies used for analysis. We first look at correlations, then do a Factor Analysis, then a Cluster Analysis, and lastly a Discriminant Analysis. The third section is a summary and conclusions, and the final section discusses limitations of the paper and suggests where to then go in terms of future research.

DATA & METHODOLOGY

Data

Surveys were administered to 191 students at a mid-sized public university in the mid-South. Participants were randomly drawn from students who were enrolled in classes taught by the co-authors of this paper in the semester in which the surveys were administered. Before running the study, a power analysis was conducted. Power is the probability of finding statistical significance when in fact there is a statistical significance. In the case of this study, it is the likelihood of finding a correlation between the idealism and relativism questions when a relationship truly exists. Power calculations were based

on a one-sided test with a significance level of 5%. We found that in order to achieve a 90% power we needed 125 participants. The students were mostly either business or liberal arts majors and were scattered diversely amongst year-of-study (i.e., freshman, sophomore, junior, senior). Of the 191 surveys administered, 174 were usable for purposes of this study.

Correlations

In that this research revolves around Forsyth's (1980) model of Idealism and Relativism, the first order of business was to observe whether these constructs held up in context of the survey instrument administered. The first section of the survey consisted of twenty questions dealing with aspects of ethics as it relates to decision-making. Response to the questions were structured as a 7-point Likert scale with 1 being designated as "completely disagree" and 7 being "completely agree". The first ten questions were structured such that agreement was consistent with Idealism (thus, we call the first ten questions the "Idealism" questions), and the second ten questions were worded such that agreement with them would be consistent with Relativism (and so, questions 11 through 20 are deemed the "Relativism" questions).

The result from running Spearman correlations between the ten Idealism questions (Table 1) indicates almost unanimous correlation. This can be taken as evidence that the ten Idealism questions do indeed serve as a strong proxy for the same general construct. In addition, a Cronbach's alpha of .846 indicates strong internal consistency amongst these ten questions in terms of measuring a related concept.

TABLE 1
IDEALISM – CORRELATION P-VALUES

	I1	I2	I3	I4	I5	I6	I7	I8	I9	I10
I1		.000	.000	.000	.000	.000	.052	.000	.000	.000
I2	.000		.000	.000	.000	.000	.002	.000	.000	.000
I3	.000	.000		.000	.000	.000	.000	.000	.000	.000
I4	.000	.000	.000		.000	.000	.131	.000	.000	.000
I5	.000	.000	.000	.000		.000	.000	.000	.000	.000
I6	.000	.000	.000	.000	.000		.024	.000	.000	.018
I7	.052	.002	.000	.131	.000	.024		.018	.000	.000
I8	.000	.000	.000	.000	.000	.000	.018		.000	.000
I9	.000	.000	.000	.000	.000	.000	.000	.000		.000
I10	.000	.000	.000	.000	.000	.018	.000	.000	.000	

The result from the Spearman correlations between the ten Relativism questions (Table 2) are not as strong as those for the Idealism questions; but nonetheless, with

38 of the 45 total possible correlations being statistically significant, this too offers relatively strong evidence that a similar construct is being represented by those ten questions. Cronbach's alpha for the ten Relativism questions was .726 – indicative of at least “acceptable” internal consistency.

TABLE 2 RELATIVISM – CORRELATION P-VALUES										
	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10
R1		.483	.006	.108	.000	.001	.004	.287	.226	.060
R2	.483		.000	.002	.001	.456	.040	.002	.001	.002
R3	.006	.000		.000	.000	.000	.000	.007	.028	.069
R4	.108	.002	.000		.000	.000	.148	.003	.447	.028
R5	.000	.001	.000	.000		.000	.000	.000	.002	.000
R6	.001	.456	.000	.000	.000		.000	.005	.299	.055
R7	.004	.040	.000	.148	.000	.000		.000	.000	.000
R8	.287	.002	.007	.003	.000	.005	.000		.001	.000
R9	.226	.001	.028	.447	.002	.229	.000	.001		.000
R10	.060	.002	.069	.028	.000	.055	.000	.000	.000	

Finally, when we look at Spearman correlations between the ten Idealism questions and the ten Relativism questions (Table 3) we see that only 16% of possible correlations are statistically significant. From this we conclude that the Idealism construct and the Relativism construct are essentially NOT correlated.

TABLE 3 IDEALISM – RELATIVISM CORRELATION P-VALUES										
	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10
I1	.010	.283	.125	.499	.067	.221	.307	.097	.233	.313
I2	.127	.267	.277	.331	.410	.175	.439	.185	.241	.375
I3	.436	.222	.468	.411	.388	.099	.062	.488	.090	.327
I4	.000	.463	.126	.368	.029	.497	.110	.451	.092	.039
I5	.003	.324	.183	.346	.039	.233	.273	.068	.177	.117
I6	.275	.331	.333	.344	.362	.021	.371	.331	.422	.469
I7	.000	.059	.277	.011	.068	.003	.367	.362	.398	.428
I8	.040	.378	.248	.185	.181	.264	.498	.034	.433	.301
I9	.332	.452	.024	.378	.042	.002	.087	.396	.368	.436
I10	.331	.333	.119	.340	.380	.007	.405	.207	.095	.304

In summary, all of this goes to support the internal consistency of the survey instrument in distinguishing between Idealism and Relativism.

Factor Analysis

Having established strong evidence from correlations that Idealism and Relativism, as posited by the survey instrument, are indeed distinct and separable constructs, we now seek further confirmatory evidence that

the twenty questions of the survey are separated into their proper respective groups of Idealism and Relativism. We can do this with a factor analysis. If the first ten questions are uniquely indicative of Idealism and the second ten questions uniquely indicative of Relativism, they should “cluster” as such.

When all twenty (ten Idealism and ten Relativism) survey questions were loaded in the Factor Analysis, and a two-factor solution was forced, the twenty questions did group as expected (Table 4). All ten idealism questions loaded on to the first group, with loading factors ranging from .843 to .344. Eight of the ten idealism questions had loading factors above .50 on Factor 1 and there were few cross loadings with the relativism questions. Conversely, all ten relativism questions grouped on the second factor. Loading factors ranged from .691 to .397. The low number of cross loadings for each factor lends support that the factors are distinct from one another.

TABLE 4 COMPONENT MATRIX		
	Component	
	1	2
I5	.843	
I1	.771	
I2	.768	
I4	.760	
I6	.753	
I3	.717	
I8	.586	
I9	.513	
I10	.439	
I7	.344	
R5		.691
R7		.635
R6		.604
R10		.566
R9		.495
R8		.491
R3		.448
R4		.434
R1		.404
R2		.397
Extraction Method: Principal Component Analysis a. 2 component extracted		

When the all twenty survey questions were loaded in an “open-ended” Factor Analysis, i.e., with as many factors allowed to develop as a Varimax rotation methodology would generate, a different solution resulted (Table 5). Notice that the twenty questions now distill to six factors; but the factors can be still be separated into two groups - two consisting of Idealism questions

and four consisting of Relativism questions. This delineation is totally “pure” with the one exception of Relativism question #11 being thrust in the middle of factor 3 along with three Idealism questions. We take this result to be further evidence that the notions of Idealism and Relativism are indeed distinct constructs that can be statistically separated from each other, and therefore constitutes additional confirmation of the reasonableness of Forsythe’s Idealism/Relativism Model.

TABLE 5
ROTATED COMPONENT MATRIX

	Component					
	1	2	3	4	5	6
I5	.861					
I1	.794					
I2	.781					
I4	.781					
I6	.779					
I3	.684					
I8	.586					
R9		.911				
R10		.901				
I7			.754			
R1			.657			
I9						
I10						
R7				.803		
R8				.723		
R6				.608		
R3					.789	
R2					.689	
R4						.826
R5						

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 13 iterations.

Frequencies

At this point in the analysis we want to explicitly quantify how many of this 174-member sample can be labeled as Idealistic versus Relativistic. To do so, for each subject in the study we simply computed an aggregate score for the first ten questions of the survey (Idealism) and also an aggregate score for the second ten questions of the survey (Relativism). To classify an individual subject as being either an Idealist or a Relativist we compared the two aggregate scores and according to which ever of the

two was the largest, and that was the classification. Proceeding in this manner through all 174 usable subjects, 139 were classified as Idealists and 35 were classified as Relativists.

Cluster Analysis

Having established in the above Frequencies Section how many respondents are Idealistic (139) versus how many are Relativistic (35), and having observed in the Factor Analysis Section that the twenty questions of the survey do group rationally into the two overriding constructs of Idealism and Relativism, we next turn our attention to the question: “Do the subjects of this study rationally aggregate, based on the detailed twenty questions of the survey, into the two pools of Idealism and Relativism?” The tool we use to explore this question is Cluster Analysis.

Similar to Factor Analysis, Cluster Analysis distills a larger number of items into a smaller number of similar or “like-kind” items. The difference between the two techniques is that whereas Factor Analysis looks at predictor variables (the right side of the relational equation $y = f(x)$) and condenses them into a smaller number of statistically significant factors, Cluster Analysis (given a selected number of predictor variables) groups the subjects into a smaller number of groups. Here in this study our objective is to see if the subjects of this study do cluster into the two groups of Idealists versus Relativists.

We ran the Cluster Analysis twice and the first time we designated all twenty survey questions as predictor variables with the cases being the respondents to the study. As previously explained in the Frequency section of this paper, the respondents were pre-designated as being either Idealistic or Relativistic based on the predominate aggregate score of the first ten (the Idealism) questions of the survey compared to the aggregate score of the second ten (the Relativism) questions of the survey. Using all twenty survey questions as predictors, did the subjects of the survey actually cluster into these two groups? A Within-Groups-Linkage Cluster Method (with cluster separation computed by squared Euclidean distance) was used and the answer is - “moderately so”. Of the 35 “actual” Relativists, the Cluster Analysis designated only 17. However, it is interesting to note that all 17 subjects labeled by the analysis as Relativists were also designated as Relativists by our simple comparison-of-aggregate-score technique. Eighteen of the Relativists were misclassified as Idealists.

We then ran the Cluster Analysis a second time, this time loading in as predictors only the top ten most pre-

dictive survey questions as indicated by the rotated Factor Analysis. These were questions 1,2,4,5, and 6 and questions 13,14,17,19, and 20 - thus 5 Idealism questions and 5 Relativism questions. This time 39 subjects were classified as being Relativists. But upon closer examination, we observed that 24 of the designated Relativists were classified correctly and 15 of the Idealists were incorrectly classified as Relativists. Nonetheless, this gives us a 68% ($24 \div 35$) correct classification rate for the Relativists.

The conclusion we reach from the above analysis is that there is evidence from Cluster Analysis that the subjects of this study do cluster, with moderate accuracy, into the two groups of Idealists and Relativists.

Discriminant Analysis

Yet another way to look at the issue of whether respondents do in fact aggregate rationally into the two groups of Idealism versus Relativism is to examine whether group membership can be **predicted** based on certain of the twenty question asked in the survey. The tool that can answer this question is Discriminant Analysis.

Again, we ran two versions of the analysis. In the first, for the predictor variables we looked to factor loadings to indicate the survey questions with the strongest predictive value. Recall again, from Table 5 we see that the 5 strongest Idealism questions are #'s 1,2,4,5, and 6. The five strongest Relativism questions are #'s 13,14,17,19, and 20. Loading in just these ten questions as the independent variables in the Discriminant Analysis produced results as indicated in Table 6. Note that this

TABLE 6 CLASSIFICATION RESULTS (IDEALISM Q-1, 2, 4, 5, 6; RELATIVISM Q-13, 14, 17, 19, 20)					
Cluster			Predicted Group Membership		Total
			1	2	
Original	Count	1	30	5	35
		2	9	130	139
		Ungrouped cases	3	2	5
	%	1	85.7	14.3	100
		2	6.5	93.5	100
		Ungrouped cases	60.0	40.0	100

92% of original grouped cases correctly classified.

group of predictors gives us a 92% correct-classification rate.

When we load in all twenty survey questions as independent variables in the Discriminant Analysis we get results as indicated in Table 7. Note that the correct classification percentage improves a bit to 95.4%

TABLE 7 CLASSIFICATION RESULTS (ALL 20 QUESTIONS LOADED)					
Cluster			Predicted Group Membership		Total
			1	2	
Original	Count	1	30	5	35
		2	3	136	139
		Ungrouped cases	1	3	4
	%	1	85.7	14.3	100
		2	2.2	97.8	100
		Ungrouped cases	25.0	75.0	100
95.4% of original grouped cases correctly classified.					

The results from the Discriminant Analysis are strong. Loading in all 20 Idealism/Relativism questions from the survey as "predictors", over 95% of the respondents were properly classified in their respective groups of Idealistic versus Relativistic. Perhaps even more interesting was the result that using just a selected number of the 20 questions – just ten (5 Idealism and 5 Relativism) questions – in the Discriminant Analysis provided almost as strong of predictive ability. A discriminant model with just the ten questions produced a correct classification percentage of 92%.

Conclusions

We conclude that the results of this study largely confirms Forsyth's (1980) model of Idealism/Relativism. From the Spearman correlations we find that the ten survey Idealism questions strongly correlate amongst themselves, as they should. Likewise, the ten survey Relativism questions also have predominately strong correlations among themselves, as they should. On the other hand, the ten Idealism questions and the ten Relativism questions do **not** strongly correlation among themselves, and this is an expected result. The Factor Analysis shows that the twenty survey questions do in fact separate rationally in their two respective groups of Idealism and Relativism. The Cluster Analysis then shows that given an individual respondent has been identified as either Idealistic or Relativistic, they do in

fact cluster along those same two parameters and in approximately the same proportions as is "actual". Finally, the Discriminant Analysis shows that group membership of respondents (Idealistic versus Relativistic) can be predicted with a high degree of accuracy (95%).

All of this evidence taken together, therefore, allows us to say with a fair amount of confidence that people can, indeed, be delineated along the lines of Idealism and Relativism. Furthermore, we also conclude that the survey instrument that we used for this study does a creditable job of making that delineation.

Limitations and Future Research

This paper illustrates the classic trade-off between internal and external validity. In formal statistics texts there are usually indicated several types of internal validity; but in simple terms, the issue can be addressed in terms of two basic questions: 1) "Is there association between variables?" and 2) "Are you measuring what you intend to measure?" The variables in this study are the ten Idealism and the ten Relativism questions of the EPQ. Correlations, Cronbach's alpha, and Factor Analysis results all imply relatively strong association and consistent measurement of whatever it is that we are measuring. We submit that it is reasonable to assert that we are indeed measuring the notions of Idealism and Relativism. So, it can be said that the internal validity of this study is relatively strong. On the other hand, the issue of whether the results of this study generalize to the rest of the world (i.e., does it have external validity) is debatable. We used a relatively small sample of college students as a proxy for the rest of the world, which some would say is of specious external validity; so, this perhaps is the greatest limitation of this study.

In spite of the relatively strong confirmatory evidence this study presents in support of the validity of Forsyth's (1980) EPQ and the constructs of Idealism and Relativism, evidence does emerge that perhaps this two-construct model of human ethical decision-making can be improved upon. In the Factor Analysis section, we present evidence that rather than two essential factors, there may be as many as six – two Idealism oriented and four Relativism oriented. In fact, in subsequent work Forsyth (1980) himself evolved the EPQ and suggested at least a four-construct model comprised of factors that he called situationalists, absolutists, subjectivists, and exceptionalists. The distinctions between these four factors is beyond the scope of this paper, but this study does suggest that further research into this expanded model of moral philosophy and ethical decision-making is warranted.

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UTILIZATION OF THE MYERS-BRIGGS TYPE INDICATOR® IN THE WORK PLACE

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ABSTRACT

The Myers-Briggs Type Indicator® (MBTI®) is a personality instrument with numerous applications. The focus of this article is on the effects of each personality preference in the work place and how insight into our own psychological preferences and the preferences of others may increase both our effectiveness and satisfaction in the workplace.

Introduction

Extensive work identifying personality types and preferences in the early 1900s by Swiss psychiatrist Carl G. Jung confirmed that individuals have mental or psychological preferences for performing certain tasks, just as they have physical preferences such as a dominant hand or eye. Many human mental processes are not conscious but nonetheless dictate various personal traits and choices (e.g., preferred communication patterns, study habits, modes of relaxation, stressors, etc.). Jung utilized this knowledge in dealing with patients, students, and people with whom he came in contact, and wrote and lectured extensively on his theory of personality preferences.

Two students of Jung's work -- Isabel Briggs Myers and her mother Katherine C. Briggs -- conducted research in the early 1940s on how to measure personality preferences and invited Jung to participate in their research. Jung declined to become involved in the research because of other projects that consumed his time, the geo-

graphical distance between himself and the researchers, and his age. Apparently, however, Jung recognized that their work could potentially help move his theory of type into practical applications, because he encouraged the mother-daughter pair to go forward with their research. Subsequently, as a result of their research and development, Myers and Briggs' (1943/1976) Type Indicator (MBTI®) emerged as a personality instrument having numerous applications (Hirsh & Kummerow, 1992; McCaulley, 1989; Myers, 1995).

The Myers-Briggs Type Indicator®

The MBTI® (Myers & Briggs, 1943/1976) can best be described as a self-report questionnaire designed to make Jung's theory of psychological types understandable and useful in everyday life. MBTI® results identify valuable differences between normal, healthy people--differences that can result in much misunderstanding and miscommunication. The MBTI® can help people better understand themselves: their motivations, natural strengths, and potential for growth (Myers, 1998).

Continuing research and development for over 60 years has made the current MBTI® the most widely used instrument for understanding normal personality differences. The instrument's applications cut across many areas, including (a) self-understanding and development; (b) stress management; (c) team building; (d) organizational development; (e) understanding learning styles; and (f) preferred communication styles.

Based on Jung's premise that people have preferences, and there are two opposing behavioral dichotomies for each of four basic preferences (energizing, attending, deciding, living), the MBTI® identifies and measures eight mental or psychological preferences for performing certain tasks, outlined as follows by Hirsch and Kummerow (1992):

There are two ways a person can be energized. Extroversion is the preference that relates to drawing energy from outside oneself in the external world of peers, activities, and things. Introversion is the preference that relates to drawing energy from one's inner world of ideas, emotions, and impressions.

The two preferences for attending are Sensing and Intuition. Sensing relates to the preference for paying attention to information that is perceived directly through the five senses and for focusing on what actually exists. Intuition refers to the preference for paying attention to information that is taken in through a "sixth sense" and for noticing what might or could be, rather than what actually exists.

The deciding preferences are Thinking and Feeling. Thinking is the preference that relates to organizing and structuring information to decide in a logical and objective way. Feeling is related to the preference for organizing and structuring information to decide in a personal, value-oriented way.

Judgment and Perception are the two preferences that relate to how one likes to live one's life. Judgment is the preference that relates to living a planned and organized life. Perception refers to the preference for living in a more spontaneous and flexible way (pp. 5-6)

Even though people use all eight preferences, only one from each of the four basic preference pairs is generally favored. The combination of these four preferences results in a psychological type (e.g., Introverted-Intuitive-Thinking-Judging).

Using the MBTI® in the Work Place

The MBTI® is used widely in the workplace, including in most of the Fortune 500 companies (Shuit, 2003). Information gleaned from the MBTI® can be used constructively to better understand the possible effects of psychological preferences on worker satisfaction and effectiveness. Knowledge of psychological preferences enables individuals to look at themselves in relation to others, to their work, and to their overall environment (Hirsh, 1991; Hirsh & Kise, 2001). The potential afforded by the utilization of knowledge of personality preferences to develop a more effective and more harmonious work place cannot be fully described in a brief article such as this one. However, an introduction to type could provide individuals with an impetus for attaining a broader personal awareness of their own personal likes and dislikes and personal strengths and weaknesses, while at the same time gaining a better understanding and appreciation of the likes and dislikes and strengths and weaknesses of their work place associates.

MBTI® research data have indicated that different personality types bring different strengths and potential weaknesses to work situations. In the realm of energizing, or how and where one draws energy, extroverts like variety and action; are often good at greeting people; like having people around in the working environment; and like learning a new task by talking with someone. At the same time, extroverts are sometimes impatient with long, slow jobs; often act quickly, sometimes without thinking; and may prefer verbal communication to written communication. Introverts, conversely, prefer quiet for concentration; work alone contentedly; can work on one project for a long time without interruptions; and may prefer written communication. Introverts have trouble remembering names and faces; think before they act, sometimes without acting; dislike being interrupted; and may prefer to learn by reading rather than talking or experiencing (Hirsh & Kise, 2001, pp. 4-41). Commenting on the effect of personality preferences on group and or team work, Larry Demarest (1997) observed that an extrovert will often speak up right away; will let others know what she/he thinks or feels; seeks, gives, and desires more feedback; and regards meetings as places to build relationships and to get work done. On the other hand, introverts may need to be asked what they think or feel; prefer to speak up only

after observing and formulating their own questions; seek, give, and desire less feedback; and regard meetings as taking time away from work and as places where more work gets generated (Demarest, 1997, pp. 4-5).

In the realm of attending -- or information gathering -- persons who are sensing types (i.e., pay attention to information that is perceived directly through the five senses) tend to have more accurate self-representation in that they are aware of the uniqueness of each event; focus on what works now; like established ways of doing things; enjoy applying what they have already learned; work steadily with a realistic sense of how long it will take; reach conclusions step by step; are careful about the facts, and accept current reality as a given with which to work. Sensing types can oversimplify a task; are not often inspired; and may not trust the inspiration when they are. Individuals who are intuitive types, on the other hand, are aware of new challenges and possibilities; focus on how things could be improved; enjoy learning new skills; follow their inspirations and hunches; and ask why things are as they are. Intuitive types often dislike doing the same thing repeatedly; may leap to a conclusion quickly; may get their facts a bit wrong; can overcomplicate a task; and dislike taking time for precision (Hirsch & Kise, 2001, pp.4 - 41). When working in teams, Demarest (1997) observed that sensing types want the team to have a clear purpose and need accurate information to move ahead confidently. They may take things literally, at face value, and have little interest in discussions concerning vague, unrealistic, or theoretical possibilities. Conversely, people with a preference for intuition are comfortable with moving ahead with little or incomplete information and want the team to have an engaging vision and mission.

Individuals who favor thinking in the decision-making process are good at putting things in logical order; have a talent for analyzing a problem or situation; and are able to anticipate or predict logical outcomes. They have a need to be treated fairly; tend to respond more to people's ideas than their feelings; tend to be firm and tough minded; are able to fire or reprimand people when necessary; and may hurt people's feelings without knowing it. Individuals who favor feeling in the deciding process tend to respond to people's values as much as to their thoughts; are good at seeing how choices affect people; take an interest in the person behind the job or idea; like harmony and will work to make it happen; tend to be sympathetic; and enjoy pleasing people (Hirsch & Kise, 2001, pp. 4-42). Demarest (1997) observed that when working as part of a group or team, thinking types believe that what is accomplished is more important than how the group works together; expect the best ideas

and solutions to emerge from argument and debate; and believe that having business-like working relationships is a prerequisite to being able to focus effectively on the task. Conversely, feeling types believe that how the group works together is equally important as what is accomplished; expect the best ideas and solutions to emerge from cooperation; may experience give-and-take arguments as disruptive; prefer feedback that acknowledges contributions; and believe that having harmonious working relationships is required to focus effectively on the task (Demarest, 1997, pp. 8-9).

In the realm of living, or the type of life style adopted, individuals whose preference is more toward a judging life style are most likely work best when they can plan their work and follow the plan. They want only the essentials needed to begin their work; tend to be satisfied once they reach a decision; use lists as agendas for action; and schedule projects so that each step is completed on time. They may dislike interrupting a current project for a more urgent one; prefer to get things settled and finished; and may decide things too quickly. Perceptive types, or persons whose preference is to live in a more spontaneous and flexible manner, do not mind making last-minute changes; adapt well to changing situations; want to know all about a new job; and work well at the last minute under deadline pressure. Perceptive types may have trouble making decisions because they often feel they never have sufficient information; may have a tendency to postpone unpleasant jobs; may start too many projects and have difficulty finishing them; and use lists as reminders of all the things they have to do (Hirsch & Kise, 2001, 4-42). Demarest (1997) observed that, when working in groups/teams, judging types may take a "let's get on with it" approach and may frustrate others by deciding too quickly without sufficient input. Demarest observed that the "wait and see what rolls out" approach taken by perceptive types may frustrate other team members by bringing up new possibilities after a decision seems to have been made (Demarest, 1997, pp. 10-11).

Ethical Use of the MBTI®

Individuals with certain personality types have been found to self-select themselves for specific positions based on self-knowledge of personal preferences (Gardner & Martinko, 1996). However, researchers have cautioned that people should not completely eliminate certain occupations from job consideration solely on the basis that they are not the appropriate type (Abella & Dutton, 1994). Rather, prospective workers should thoroughly investigate and consider positions that may not be standard for their type. Pursuing such job oppor-

tunities can provide them with personal growth as well as providing significant benefits for the new work group, due to their possession of abilities that are generally rare among co-workers (Myers & Briggs, 1995).

The Center for Applications of Psychological Type's (1995) *Code of Ethics* cited nine cautions in interpreting MBTI® results. The third caution, dealing with utilizing results in job search counseling, states "One should not state or imply that type explains everything. Type does not reflect an individual's ability, intelligence, likelihood of success, emotions, or normalcy. Type is one important component of the complex human personality." Tieger and Barron-Tieger (2001) reinforced this caution by stating: "Respondents should be told that type reflects an individual's preferences, not abilities or intelligence, nor is it a predictor of success. People should not be counseled toward or away from certain jobs *solely* on the basis of type" (p. 367). Lawrence and Martin (2001) cautioned similarly:

Before we review some of the applications of type to careers, it is very important to understand that type alone is not enough information to make a career choice. Virtually all types are found in all careers. People making career decisions need to understand not only their personality type, but also their history, values, interests, skills, resources and goals, among other things (p. 140).

Finally, in answering the question, "Why should MBTI results not be used to make hiring or promotion decisions," Abella and Dutton (1994) asserted:

Ethically, no proof exists to show that people with certain preferences will not perform any given job well. It would, therefore, be unethical to deny them an equal chance for a promotion or new position. On a legal basis, such decisions would not meet the requirement that hiring criteria be clearly linked to job performance.

As Michael Segovia said, "The MBTI is meant for inclusion, not exclusion... Its purpose is not to move people in and out of the team, but to help people work more happily, more successfully, as team members" (Shuit, 2003).

Summary and Conclusion

The present day work environment has continued to evolve into a place of temporary social contracts between workers and employers and is more and more competitive because of globalization. Mergers, takeovers, buyouts, outsourcing, and so forth suggest that this competitive environment will continue, which in turn requires workers to have up-to-date skills, training, and education, as well as more self-understanding and an ability to engage in active planning. As globalization, outsourcing, etc. continue at a rapid pace in the future, workers (and the workplace) will benefit from a work force that possesses more self-knowledge and personal enlightenment (Schultz & Schultz, 2006).

Management officials at all levels will be able to provide additional empowerment to their workers by utilizing the MBTI® in teambuilding and other improvement efforts. Knowledge obtained from MBTI® research provides a type of empowerment in that individuals can (a) achieve insight into their sources of energy, information gathering, decision making, and personal lifestyle or orientation; (b) strengthen interpersonal relationships from an objective view of underlying rationales to highly charged emotional issues; (c) gain opportunity to consider different ways of meeting objectives; and (d) find encouragement toward more constructive and complementary uses of their preferences and differences.

The MBTI® provides a useful avenue to greater acceptance of individual preferences and differences for workers, as well as for those who assist in work force development and those who are looking to fill positions of employment with quality personnel. The MBTI® offers a means to understanding that a person's personality preferences can enrich both the job search and the likelihood of successful employment.

Addressing whether or not consideration of type may "fence people in," Lawrence (1993) ably responded: Not if one understands the information being offered. An understanding of personality type can free a person in several ways. It can provide confidence in one's own direction of development and help to reveal the areas in which one can excel with ease and pleasure. It can also reduce the guilt one might feel at not being able to do everything in life equally well. Acknowledging one's own preferences opens the possibility of finding constructive values instead of conflicts in the differences one might encounter with someone whose preferences are opposite one's own.

Recognizing the value of diverse personality types is of vital importance in today's workplace and personal life, but it is not a new phenomenon. As Paul wrote:

Having then gifts differing according to the grace that is given to us, whether prophecy, let us prophesy according to the proportion of faith; or ministry, let us work on our own ministering; or he that teacheth, on teaching; or he that exhorteth, on exhortation; he that giveth, let him do it with simplicity; he that ruleth, with diligence; he that sheweth mercy, with cheerfulness. (Romans 12:6-8, King James Version).

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UTILIZING THE INTERVIEW IN THE SELECTION PROCESS: A CONTINUING STUDY, 2002-2007

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ABSTRACT

This paper presents statistical data that supports earlier research indicating that the employment interview continues to be utilized by most organizations in the United States. The research data establishes that panel interviews are used far less frequently than one-person interviews. Suggestions are made concerning ways to strengthen both panel and one-person interviews.

Introduction

In terms of sheer frequency, interviews are the most popular method of selecting employees (Muchinsky, 2000). Both human resource management staff and line managers often insist that the interview should be utilized as one of the primary employee selection techniques. Heavy reliance on the interview is true for both public and private sector employers. It has been estimated that over 80% of U. S. organizations use some type of interview process, and some estimates range as high as 99% (Levy, 2003).

However, despite the popularity of the interview as a selection tool, personnel psychologists have long questioned the interview's validity in predicting successful performance on the job. These validity questions reach back to the very beginning of industrial psychology. One of the first research efforts on the interview was a study in 1915 by Walter Dill Scott, a founder of industrial psychology. Scott concluded that the predictive valid-

ity of the interview was low (cited in Schultz & Schultz, 2002). More recent research studies continue to support the premise that the selection interview probably contributes very little in the way of validity to the selection process (Avery & Campion, 1982; Carlson, Thayer, Mayfield & Peterson, 1971; DeCenzo & Robbins, 1988; Dixon, Wang, Calvin, Dineen & Tomlinson, 2002; Wells & Sprinks, 1992; Schmitt, 1976). However, other studies indicate that structured interviews and the use of multiple interviewers provide improved validity (Foster & Godkin, 1998; also Dreher, Ash & Hancock, 1988; Janz, 1982; Orpen, 1985; cited in Buckley, Norris, & Wiese, 2000). In recent years, there has been a proliferation of validated, statistically-based selection procedures that could possibly serve as alternatives or be utilized along with the interview to further strengthen the selection process (Kennedy, 1994).

Frequent use of the interview in the U. S. is in sharp contrast to many countries in the eastern part of the world. Traditionally, employee interviews have not been part

of the selection process in Korea, Japan, and other Asian countries, where selection decisions have been made almost entirely on the basis of exam scores, scholastic accomplishments, and letters of recommendation. However, the interview is beginning to be more common as a screening device in these countries as well (Robbins & Judge, 2007).

Statistical Research Results

In an attempt to measure current use of the interview in the selection process, the authors have conducted a longitudinal study asking persons currently working if they had been interviewed during the selection process. While there are many different types of interviews, this study focuses on comparing the prevalence of individual and panel interviews. Panel interviews may be defined as interviews conducted by two or more people who jointly interview each candidate. Based on the results of the interviews, the candidates are rated and ranked against relevant knowledge, skills, and ability criteria by each panel member. This is in contrast to individual interviews, in which each candidate is interviewed by a single individual, who then rates and ranks the candidates. It is believed that panel interviews help to control for interviewer biases and prejudices in the hiring process.

This survey is conducted each semester in business classes at Athens State University, an upper-division institution primarily serving older students with family responsibilities and work experience. Students are asked in class if they are currently working. Those who respond positively are asked if they were or were not interviewed for their job. Those who were interviewed are then asked if the interview was conducted by an individual or by a panel. Over the five years of the study, 75.5% (750 out of 993) have reported that they have been interviewed. Almost half were interviewed by one only person, See Figure 1 for a breakdown of hiring processes.

Obviously this is a convenience sample; however, the results compare with and tend to validate the results cited above by Levy (2003). Of those who reported being in-

FIGURE 1
TYPES OF SELECTION PROCESSES



terviewed, 64.3% were interviewed by individuals and 35.3% were interviewed by a panel of interviewers. See Table 1 for a summary of the study data.

The significant drop in the percent interviewed shown in the 2005 results is surprising, but data from 2006-2007 indicate it may be a one-time aberration. Likewise, the drop in the number of 2006 and 2007 respondents who reported having been interviewed by an individual and the corresponding increase who reported being interviewed by a panel may or may not be meaningful. We will have to wait for additional data from 2007 and future years to determine whether it indicates a trend.

The less frequent utilization of a panel (compared to using one individual) to conduct the interview produces some cause for concern. Some evidence exists that structured panel or group interviews are more valid predictors of job success than traditional one-on-one interviews (Dipboye, Gaugler, Hayes & Parker, 2001; Warmke & Weston, 1992).

In 1971, Carlson, Thayer, Mayfield, and Peterson stated that it is clear that no amount of additional negative evidence on the lack of validity would alter the role of the interview in the selection process. The research referenced by Levy (2003) and the research conducted by the authors strongly suggests that Carlson et al.'s deduc-

TABLE 1
NUMBER AND PERCENTAGE OF RESPONDENTS

	Total		2002-03	2004	2005	2006	2007
	No.	%					
Working	993		N=346	N=133	N=282	N=171	N=61
Interviewed	750	75.5%	78.3%	81.2%	66.7%	77.2%	83.6%
Interviewed by individual	482	64.3%	67.2%	67.6%	67.0%	57.6%	54.9%
Interviewed by panel	265	35.3%	32.8%	32.4%	33.0%	42.4%	45.1%

tion is most likely true. The task at hand is to attempt to make the interview process as effective as possible because of the continued popularity of interviews as an important component of the hiring process.

Discussion: Improvements to the Interview Process

Both the business literature and the results of the survey discussed above indicate the continuing reliance on the interview in the hiring process, and the prevalence of the individual interview over the use of a panel. However, as Koen has pointed out, not every supervisor is able to conduct an effective employment interview (2004). Guidance is still needed to prepare and conduct a valid, reliable interview.

Recent research by Foster and Godwin (1998) and by Campion and Palmer (1997) indicates that structured selection interviews may demonstrate improved psychometric properties, resulting in a more stable, longer-tenured work force. Campion and Palmer have identified a number of techniques that may enhance the content or evaluation process in the interview. These include basing questions on a job analysis, asking the same questions of each interviewee, limiting prompting or follow-up questioning, using a longer interview or more questions, limiting ancillary information that may confound the interpretation of the interview, not allowing questions from the interviewee during the interview, using anchored ratings scales, using the same interviewers for all candidates, and providing extensive interviewing training (Campion & Palmer, 1997). In-depth training of interviewers is vital to successful selection interviewing, and concerted efforts should be directed toward insuring that everyone involved in the interview process receive intensive initial and follow-up training in order to insure continuous improvement (Dixon, Wang, Calvin, Dinnen & Tomlinson, 2002; Huffcutt & Woehr, 1999; Sunoo, 1996).

Based on a study of research focusing on panel interviews, Dixon et al. proposed an eight-step framework (2002) for successful selection interviewing. The eight steps include:

1. Perform a job analysis
2. Develop questions based on this analysis. Questions can be either behavioral or situational. Both types have shown good validity, although there is some evidence that behav-

ioral questions may provide slightly better validity.

3. Develop scoring anchors. Establishing scoring benchmarks has been shown to improve interrater reliability in panel interviews.
4. Select panel members. Interview validity has been shown to be related to the number of interviewers, and panel interviews demonstrate increased reliability.
5. Train interviewers. Research has indicated that training has more effect on interview validity than other variables, including structure, note taking, and format of interviews.
6. Conduct the interviews. Structured interviews, in which each candidate is asked the same questions in same order, tend to increase validity and reliability.
7. Evaluate the candidates. When using a panel or multiple interviewers, evaluation can be done through statistical averaging or discussion leading to a consensus. Research indicates that either method is acceptable with neither method demonstrating superiority.
8. Evaluate selection decisions based on subsequent employee performance. The predictive validity of interviews in relation to subsequent performance varies depending upon the performance criteria, and further research is needed in this area. However, analysis of hiring success is vital to understanding and improving the interview and selection process.

Greenberg and Barron (2003) stress that the impressions prospective employers form of candidates may be based on subtle behaviors, such as how the candidates dress and speak, or more elaborate acts, such as announcing accomplishments. Actions by the interviewees may be the result of calculated efforts to get others to think of them in a certain way or may be passive, unintended effects of their actions. Davis and Brown (1992), Imada and Hakel (1977), and Ugba and Evuleocha (1992) have stated that, generally, the more positive the nonverbal cues transmitted by applicants, the higher the ratings they receive from interviewers. Telephone interviews may help avoid biases based on appearance, background, and similar nonverbal communication factors, increasing the objectivity of the interview and the defensibility of the selection (Schmidt & Rader, 1999). However,

as Lim, Winter and Chan (2006) point out, telephone interviews may highlight cultural differences and create potential biases in the interview and hiring processes. As the work force becomes more multicultural, effective training in cultural sensitivity will become more important for successful interviewing.

Information and research addressing the serious flaws and shortcomings of the interview process are not new. In order to maximize the strong points of the interview and minimize the weak points for all persons involved in the process, Kennedy (1994) suggests the following:

- Intensive training should be provided in the dynamics of the interview decision-making process.
- Interview questions should be thoroughly based on knowledge, skills, and abilities of the specific position being filled. As a part of this process, each question would be reviewed and approved by the human resource specialist responsible for recruiting for the position.
- Prior to beginning the recruiting process, a recruitment-staffing guide should be developed. The guide would state the weight to be given to the interview and provide guidelines for combining results with other information.
- A method for scoring should be provided that combines results of all other rating devices in developing an overall score for the person interviewed.
- Specific decisions should be reached concerning all aspects of the interview (i.e., length of time, number of questions) and should be part of the written guidance for conducting the interview.
- A structured interview-rating guide should be developed that specifically outlines benchmark answers that can be ranked. A sample rating scale would include descriptive anchors such as unacceptable, barely acceptable, average, above average, and superior. These descriptors would be employed by the interviewer to rate each interview question response, even though benchmark answers would vary from one question to the next.
- For key, high-level technical and managerial positions, or when filling positions that most

likely will lead to high level positions, a panel of at least three subject matter experts should be employed. Preferably these subject matter experts would also participate in conducting the job analysis, writing the interview questions, and developing the benchmark interview answers.

- All information concerning the interview process would be retained along with all of the other recruitment information.
- Follow up analyses should be conducted to determine how well the selectee actually performed in the position as compared with his or her scores during the interview.

Summary

Earlier research as well as research for this article suggests the following four points:

1. Line management and human resource management officials most likely will continue to use the interview despite its limitations.
2. Individual civil actions against both government and private agencies for alleged discriminatory personnel actions based on race, color, religion, sex, age, or national origin have increased markedly since the early 1970s (Kennedy, 1988a), constituting a trend that will likely continue.
3. The work force will continue to be more multicultural. Multiculturalism may compound interview problems such as misreading body language, eye contact or the lack thereof, and other personal and communication traits that often differ between cultures. Use of multiple interviewers representing diverse perspectives and cultures may minimize these misunderstandings (Babcock, 2006). If we understand how culture influences the people who work for us, we can respond to them more effectively and do a better job of attracting, hiring, and retaining the workers we want. This will be important in a workplace characterized by a smaller number of entry-level people and considerably more work-force diversity (Kennedy & Everest, 1996).
4. Steps should be taken to involve employee groups in the development of the best possible

interview procedures in order to promote both the understanding and acceptance of the procedures that are developed. In organizations where a labor contract has been negotiated, labor union representatives should be involved from the very beginning of the process. Involvement should insure that labor and unions are more responsive to and supportive of the entire recruitment and selection process. The additional expertise and support provided by employees and union representatives will add immeasurably to the development of a viable, effective interview to assist in attaining the goal of employing the most qualified and effective employee.

Despite recognized weaknesses and limitations, the employment interview continues to be a fact of life for both job seekers and human resource professionals. Industrial psychologists, human resource administrators, employment counselors and others should strive for continuous improvement in the entire recruitment process, with particular attention to the interview. Continuous improvement will help to insure proper selection decisions that subsequently will decrease problems for the organization and for the organization's customers. This effort should help decrease turnover rates, increase productivity, improve employee morale, lower grievances and other employee complaints and in general lead to a more stable organization. Human resource managers and other professionals should become advocates for more efficient and comprehensive program review procedures (Kennedy, 1988b). The increasingly legalistic American society requires valid recruitment decisions that are defensible if the need should arise. Increased emphasis should be placed on use of carefully trained interview panels or groups rather than individual interviews.

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USE OF HIERARCHICAL VALUE MAPPING IN HEALTH SERVICES RESEARCH

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ABSTRACT

Addressing value creation in the U.S. health care system is an important topic in light of rising costs and increasing access barriers. Value creation at the systemic level must be related to value creation at the consumer level. Hierarchical Value Mapping methods borrowed from marketing research represent a useful tool for identifying what creates value for consumers of health services. Using these methods, restructuring of the health care delivery system can be addressed in the context of consumer value creation. This paper demonstrates how these methods can be used to identify health care consumer values and thereby facilitate increasing the value delivered to them by the health care system.

INTRODUCTION

The U.S. health care system continues to face substantial challenges in delivering accessible cost-effective health care. Over 40 million Americans are uninsured, significant disparities in health status widen among population subgroups, over 100,000 deaths are attributable to medical errors each year, and costs continue to escalate at more than double the rate of inflation, among other problems (Porter & Teisberg, 2006). Addressing these challenges requires that the health care system deliver increased value to its users (Porter & Teisberg, 2006). However, value is an elusive concept. What is value? Who defines value? How is value measured? All of these are questions that confound this debate. Indeed, answering these questions in a highly pluralistic health care system is complicated by even identifying who should answer questions about value.

In a market economy, value is typically defined by consumers. Value can be defined as features of a product or service that are important to consumers and thus provide the basis for an exchange transaction (Kotler & Keller, 2005). Marketing professionals have developed a number of methods for identifying what is valued by consumers as a basis for formulating product/service offerings. One marketing research technique widely used for this purpose is hierarchical value mapping (HVM) (Reynolds & Gutman, 1988). This qualitative research technique involves conducting "laddering" interviews to define the "means-end chain" that links product/service attributes with consumers desired end-states (i.e., values) related to a market offering (Gutman, 1982). This technique can be usefully employed in health

services research to address the need to create value in the health care system for consumers and thereby help reconcile micro-level consumer value with macro-level system value.

The purpose of this paper is to demonstrate how HVM can be used as a technique for identifying health care consumer's values and thereby increase the value delivered by the health care system to them. The paper proceeds by first briefly reviewing literature related to HVM. Next, an example is provided to demonstrate the use of HVM techniques in health services research. Specifically, an exploratory study to identify underlying values associated with patient satisfaction with their primary care physician including design, sample, methods, and results is presented. Finally, conclusions are discussed and directions for future research are given.

LITERATURE REVIEW

What is meant by value is important to understanding HVM. First, a distinction must be made between what it means "to value" something (e.g., product/service) and "value". To value something is an act of appraisal related to the object of the valuing that results in a judgment weighting benefits versus sacrifices (Woodruff, 1997; Zeithmal, 1988); whereas, value is a belief that influences behavior concerning the object (Flint, Woodruff, & Gardial, 1997; Rokeach, 1979). Values are high level abstractions that influence decision-makers behavior and that do not change easily or often (Flint, Woodruff, & Gardial, 1997). Values have long been viewed as desired end-states toward which individual behavior is directed (Maslow, 1970; Rokeach, 1979). In this context, value

creation occurs when a decision-maker's (e.g., consumer, customer, patient) appraisal reaches a desired end-state with regard to a product/service (Gutman, 1982). This appraisal represents an overall assessment of utility to the decision-maker based on benefits occurring from use versus sacrifices made in use (Zeithaml, 1988). The way consumers perceive value influences their behavior (Woodruff, 1997).

In the marketing literature, a "means-ends chain" (Gengler & Reynolds, 1995) approach has been used to identify values of decision-makers. A mean-ends chain model was proposed by Gutman (1982; 1991) based on the assumption that desired end-states (i.e., values) directed choice behavior of decision-makers as "ends" attained using "consequences" and "attributes" as "means". End-states are centrally held core beliefs that guide decision-maker behavior in product/service use situations (Gutman, 1982; 1991). Essentially, Gutman (1982; 1991) argued that end-states are tied to consequences from use of a product/service with there being both desired and undesired consequences based on whether they facilitate or hinder attaining desired end-states. Consequences are results of decision-makers behavior that spring directly or indirectly from that behavior (Gutman, 1982; 1991). When these results, net of any undesired results, are those desired by the decision-maker, then value is created (Flint, Woodruff, & Gardial, 1997). Product/service "attributes" are identified by decision-makers that relate to producing desired and undesired consequences. Here attributes are viewed as features, characteristics, or aspects of a product or service (Zeithaml, 1988). Decision-makers develop a preference for certain attributes because of their ability to produce favorable consequences (Flint, Woodruff, & Gardial, 1997). Thus, attributes are the basis on which products or services are selected by decision-makers. Value is created through a chain of positive attributes and consequences that lead to desired end-states (Flint, Woodruff, & Gardial, 1997). Thus, identifying the attributes, consequences, and end-states provides a means-ends chain for value creation (Gutman, 1982).

A qualitative research technique referred to as "laddering" can be used to identify relationships between attributes, consequences, and desired end states to create a HVM for a decision-maker (Reynolds & Gutmann, 1988; Gengler & Reynolds, 1995). The laddering technique typically involves interviews with decision-makers to identify attributes and consequences of a product/service choice situation from which end-states can be inferred based on responses. A script of standardized questions is usually employed to evoke responses from respondents. The questions are intended to move indi-

vidual respondents from attribute preferences to consequences to desired end-states. Respondents are usually first asked what it is about the product/service that makes it different from other possible choices. These characteristics are the attributes of the product/service that are important to the respondent. Then for each attribute, one by one, the respondent is asked - "Why is [the attribute] important to you?" The respondent's answer will be a consequence. This question is asked over and over to identify consequences at higher and higher levels of abstraction until the respondent can no longer substantively respond. By this point the desired end-state has been reached. This process is repeated for each attribute until all have been "laddered". A physical map depicting the relationships between attributes, consequences, and end-states (i.e., values) can then be drawn for each respondent. The HVM's for multiple respondents can be examined and coalesced to identify salient patterns of values for subgroups.

HIERARCHICAL VALUE MAPPING EXAMPLE

This section of the paper provides an example of the application of HVM technique to demonstrate its utility in health services research. The purpose of this exploratory study was to identify underlying values associated with a patient's (i.e., decision-maker) satisfaction with his or her primary care physician (i.e., product/service). A secondary objective was to formulate a tentative model to explain the relationship between patient values and satisfaction to serve as a basis for future research in this area. The following subsections explain the study design, methodology, and sample; discuss findings; and present conclusions and recommendations.

Design, Methodology, and Sample

This study was intentionally exploratory in design since its primary purpose was methodological exposition. The study design used HVM and laddering interview techniques described by Gengler & Reynolds (1995). This qualitative approach involved using the laddering interview technique to initially identify attributes of patient's satisfaction with their primary care physician. Through subsequent questioning, the researcher ascertained consequences (or benefits) patients derived from these attributes and ultimately the desired end-states (or underlying values) associated with these benefits and satisfaction. Results from these interviews were then used to create HVM's for each subject that graphically depicted their "attribute-consequence (benefit) - end-state (value)" structure. Patient satisfaction was assessed using a single question adapted from Mowen (1993) as

follows: “Overall, how would you describe your satisfaction with your primary care physician?” Responses were on a five-point scale with “1” being “Very Dissatisfied” and “5” being “Very Satisfied”. The study was conducted during September 2004. Respondent interviews lasted from 45 minutes to one hour. Based on interview results, HVM’s were constructed for each patient. Subsequently, a model was developed relating values to patient satisfaction based on these HVM’s.

A convenience sample of five patients, selected at random from acquaintances of the researcher, was used for the purpose of data collection. Interviews were conducted at the patient’s homes. The sample included three females and two males. All of the patients were Caucasian and ranged in age from mid-teen’s to mid-70’s. Three of the patients had chronic medical conditions requiring continuing treatment. Three of the patients shared the same physician. Each of the other two patients used a different physician. All of the patients had received care from their physician for more than five years and had visited their physician during the last year. Sample demographics are presented in Table 1.

Findings

As indicated in Table 2, analysis of patient interview data indicated that all five patients were satisfied or very satisfied with their primary care physician. A total of six values were identified from the sample - Trust/Confidence, Convenience/Time Efficiency, Autonomy/Control, Cost Sensitivity/Efficiency, Psychosocial Support, and Anxiety Reduction. All five patients identified Trust/Confidence as a value. This value was identified more often than any other value in the sample. The next most frequently identified value was Convenience/Time

Efficiency by four patients (A, C, D, and E). Also, all patients cited Convenience/Time Efficiency as a potential source of dissatisfaction. Autonomy/Control and Cost Sensitivity/Efficiency were each cited by two patients (Patients A, C) as values. Psychosocial Support (C) and Anxiety Reduction (B) were each cited by one patient.

Discussion

A number of interesting findings emerged from review of these data. With regard to age, the older patients (A, C, E) were all under treatment for multiple chronic conditions, with the number and seriousness of these conditions increasing directly with age. The two older female patients (A, C) rated overall satisfaction highest. The older male (E) was the only one of the older patients to rate satisfaction as “Satisfied”. The two older females (A, C) shared Autonomy/Control and Trust/Confidence as important values. The early-50’s female (A), who was still employed, highly valued Time Efficiency whereas the early-70’s female, who was retired on a fixed income, highly valued Cost Efficiency/Sensitivity and Psychosocial Support. The mid-70’s male (E) most highly valued Quality which included elements of confidence and trust, and to a lesser degree valued Convenience (both time and location) and Cost Efficiency/Sensitivity. Overall, Trust/Confidence was shared across all patients as a value related to physician satisfaction. The value of Convenience/Time Efficiency was shared by four patient’s (A, C, D, E), with it being extremely important to the two employed females (A, D). Cost Sensitivity/Efficiency was most important to the two oldest patient’s (C, E) who were retired and on a fixed income. Autonomy/Control was most important to the two oldest females (A, C) that both had multiple chronic medical problems. Psychosocial Support was

TABLE 1
SAMPLE DEMOGRAPHICS

Patient	Age	Gender	Race	Employment Status	Health Status	Primary Care Physician
A	Early 50’s	Female	Caucasian	Employed	Chronic Health Problem	Alpha
B	Mid-teens	Male	Caucasian	High School Student	Healthy	Beta
C	Early 70’s	Female	Caucasian	Retired	Multiple Chronic Health Problems	Gamma
D	Early 30’s	Female	Caucasian	Employed	Healthy	Gamma
E	Mid 70’s	Male	Caucasian	Retired	Multiple Chronic Health Problems	Gamma

TABLE 2 LEVEL OF SATISFACTION AND VALUES BY PATIENT		
Patient	Level of Satisfaction	Values
A	Very Satisfied	Time Efficiency Autonomy/Control Trust/Confidence
B	Satisfied	Trust/Confidence Anxiety Reduction
C	Very Satisfied	Psychosocial Support Autonomy/Control Trust/Confidence Cost Sensitivity/Efficiency
D	Satisfied	Convenience/Time Efficiency Trust/Confidence
E	Satisfied	Convenience Quality (Confidence) Cost Effectiveness

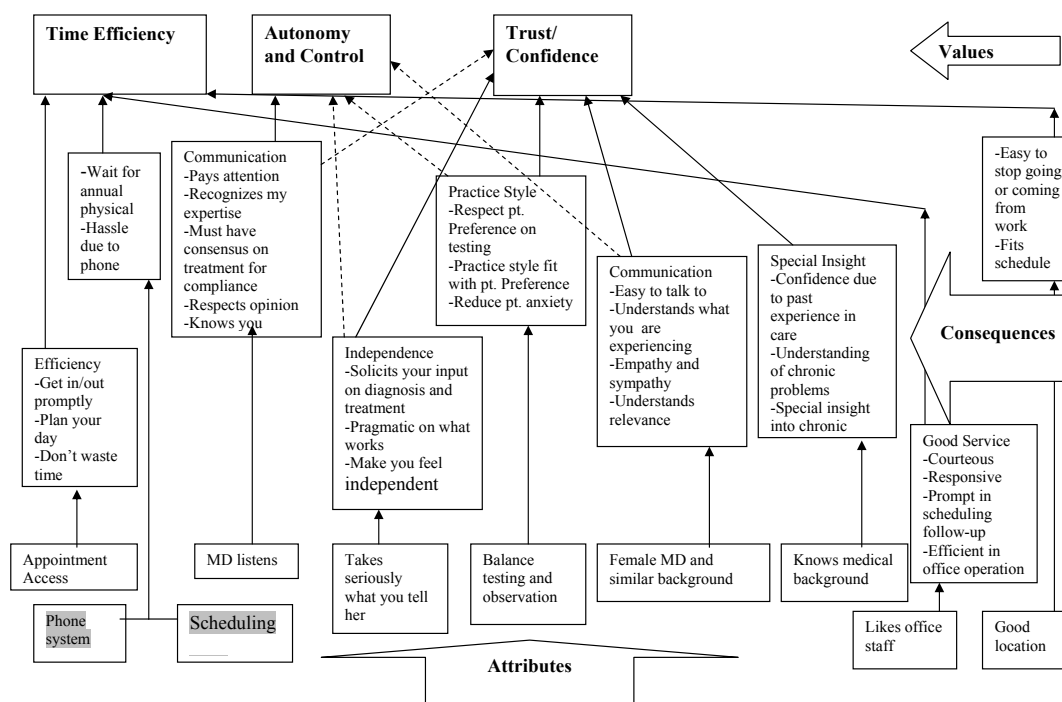
very important to the oldest female (C) who had the most chronic health problems. Interestingly, the potentially related concept of Anxiety Reduction was very

important to the youngest male (B). Uniformly among the sample, the major potential dissatisfier related to Convenience/Time Efficiency. Hierarchical value maps were created from analyses of laddering interview data for each patient and are presented in Figures 1 – 5.

On the basis of this study, several conclusions can be tentatively proposed concerning satisfaction with primary care physician that are relevant to patient values in redesign of the health care system. First, as might be expected, Trust/Confidence seems to be particularly important in determining patient satisfaction with primary care physician. Second, employment status seems to be related to the value of Convenience/Time Efficiency, as the employed patients seemed to value this very highly. Third, the retired patients on fixed incomes valued Cost Efficiency/Sensitivity. Fourth, Autonomy/Control seems to be particularly important to the older female patients with chronic health problems. Finally, Psychosocial Support and Anxiety Reduction, which may be related, are values of the two most vulnerable members of the sample.

Based on these findings, the model in Figure 6 is offered as a starting point for further investigation of factors associated with patient satisfaction with primary care physician. This tentative model depicts patient satisfaction as a dependent variable that is determined by the

FIGURE 1
HIERARCHICAL VALUE MAP PATIENT B



independent variables of Trust/Confidence, Convenience/Time Efficiency, Cost Sensitivity/Effectiveness, Autonomy/Control, and Psychosocial Support/Anxiety Reduction moderated by age, gender, medical condi-

FIGURE 2
HIERARCHICAL VALUE MAP PATIENT B

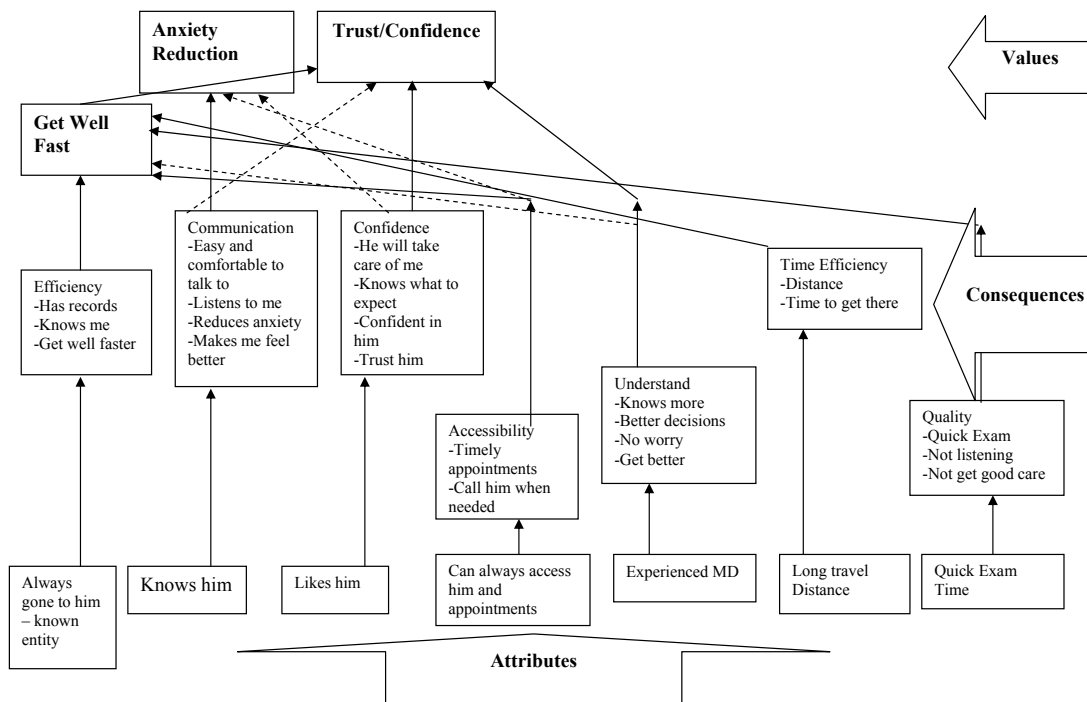


FIGURE 3
HIERARCHICAL VALUE MAP PATIENT C

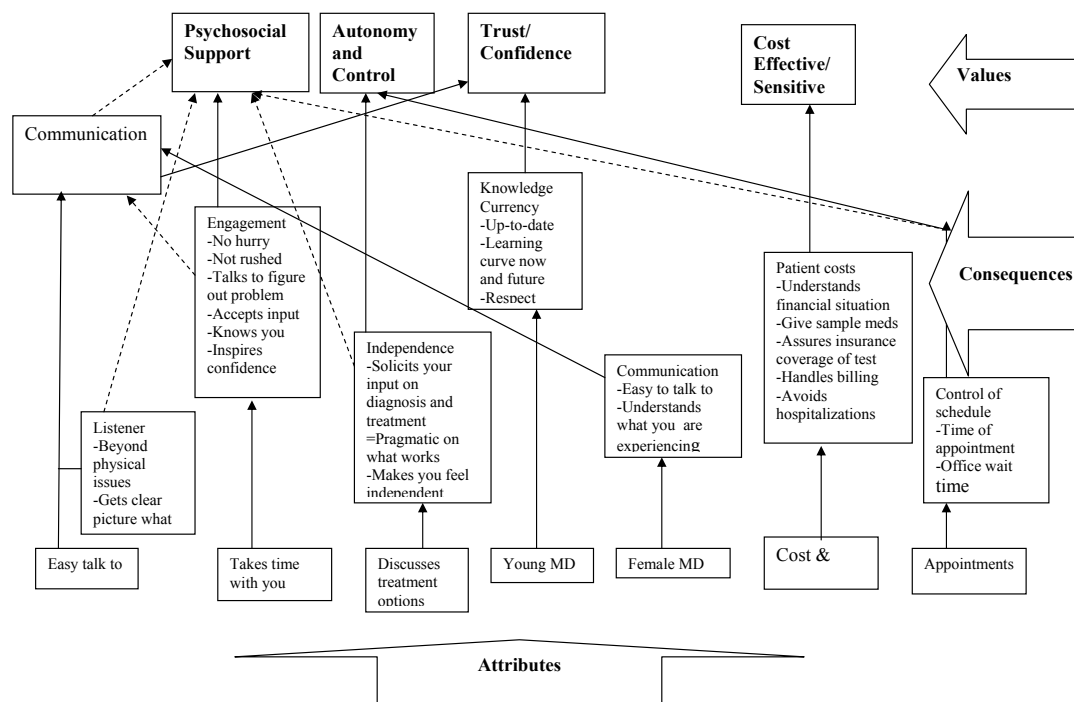
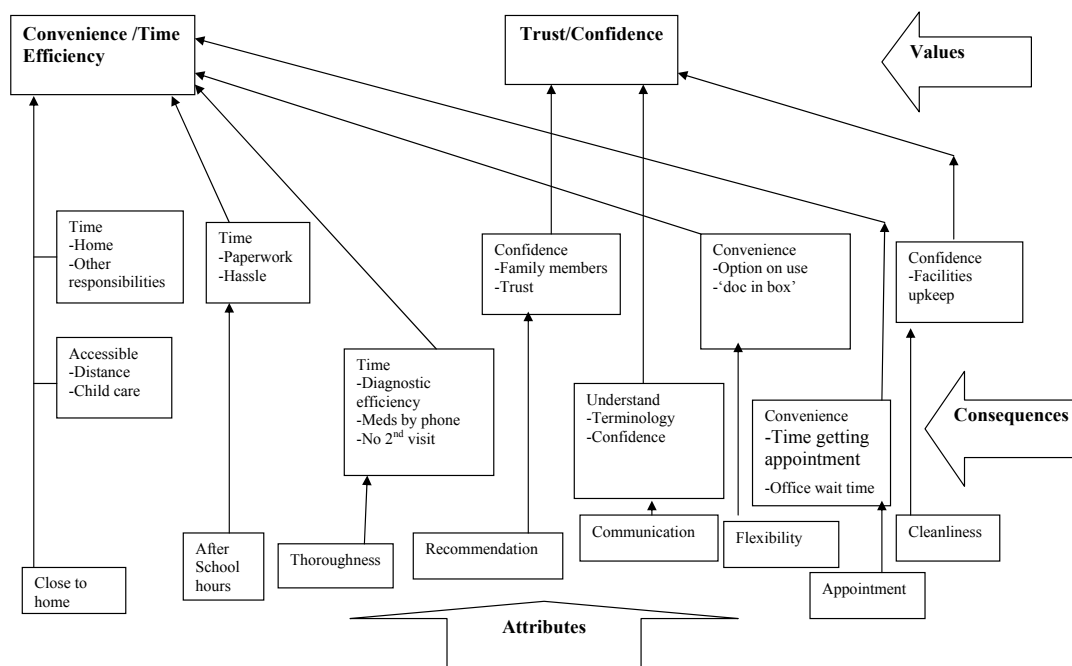


FIGURE 4
HIERARCHICAL VALUE MAP PATIENT D



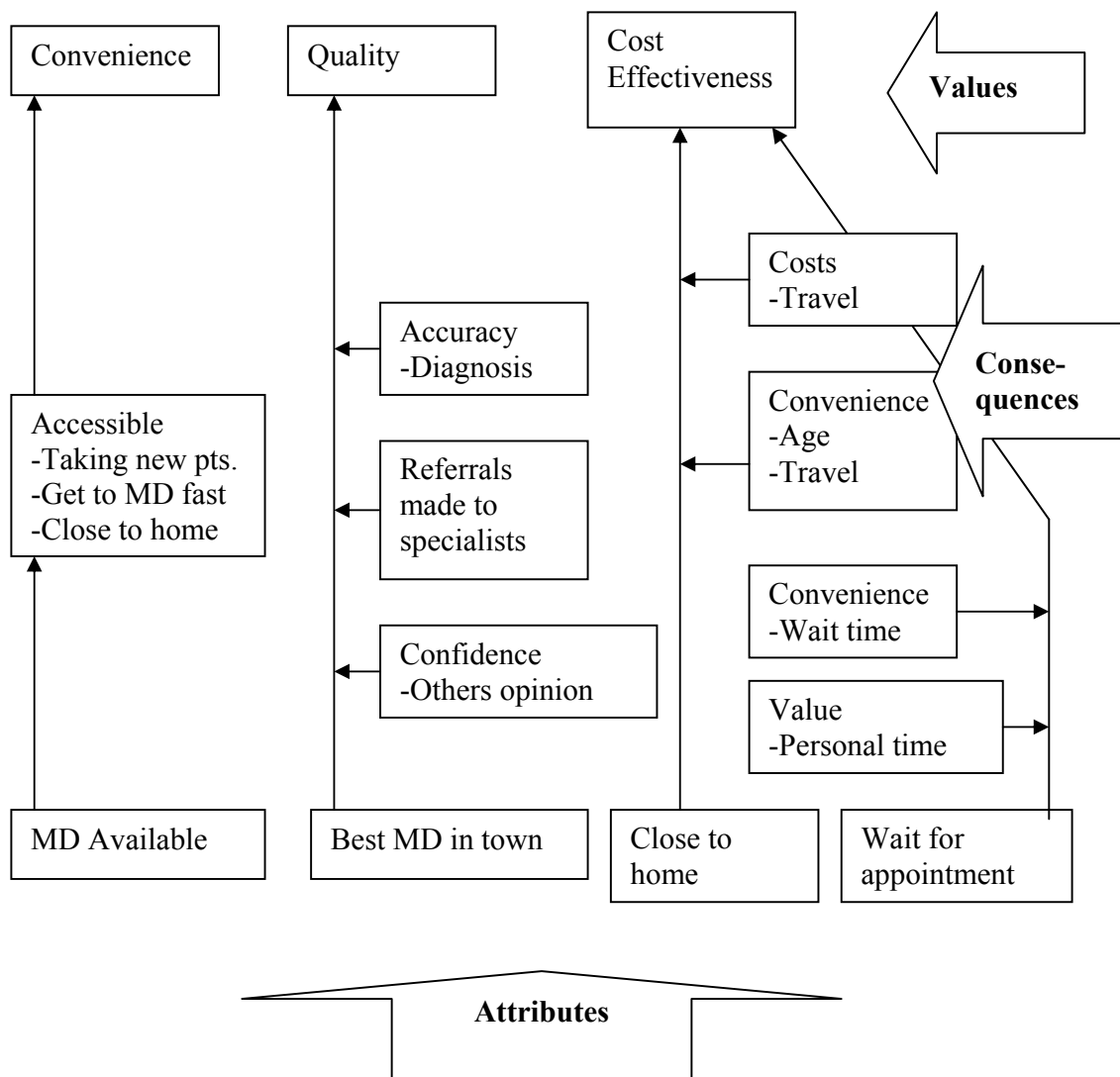
CONCLUSION AND RECOMMENDATIONS

tion, and employment status. More extensive research is needed to further examine and extend the proposed model. However, very importantly these results indicate that what is considered value varies by groups of decision-makers (i.e., consumers) based on a number of moderating factors that can provide the basis for market segmentation. Thus value creation at the system level needs to flexibly address variation in patient level value by segments to be meaningful to consumers.

This study has a number of limitations. First, this is a field study subject to the limitations that are inherent in the nature of ex post facto research methodologies (Trochim, 2001). Second, a convenience sample was used for purposes of demonstrating laddering and HVM methods. A larger and more representative sample is needed for purposes other than methodological exposition. Third, analysis of interview data was performed via manual content analysis by the researcher. Content analysis and HVM creation by multiple raters using more sophisticated methods (e.g., content analysis software) would better support reliability and validity. Finally, segmenting of consumers was primarily based on demographic factors. More refined approaches to segmentation would improve the relevance of findings to these subgroups.

Addressing value creation in the health care system is an important topic in light of rising costs and increasing access barriers to care. Value creation at the systemic level needs to be related to value creation at the consumer level. Health services have to be acceptable to consumers of these services for value to exist at the systemic level. Hierarchical value mapping via laddering techniques borrowed from marketing research provide a useful tool for identifying what creates value for consumers of health services. Using these methods, restructuring the health care delivery system can be addressed in the context of consumer value creation. It is important to keep consumers at the center of the current restructuring debate. As Porter and Teisberg (2006) observed, the nation will achieve dramatic improvements in health care faster if there is widespread agreement that the primary goal is to improve value for patients. Consumer driven value must extend beyond cost, quality, and efficacy to include acceptability to consumers, otherwise system restructuring may lead to decreased satisfaction and decreased usage of health services exacerbating disparities and other systemic problems. Restructuring must be both top down in terms of well-chosen policies that encourage value creation and bottom-up in terms of value-based competition that is driven by satisfying consumers of health services. The methods discussed in this paper can help achieve both of these goals.

FIGURE 5
HIERARCHICAL VALUE MAP PATIENT E

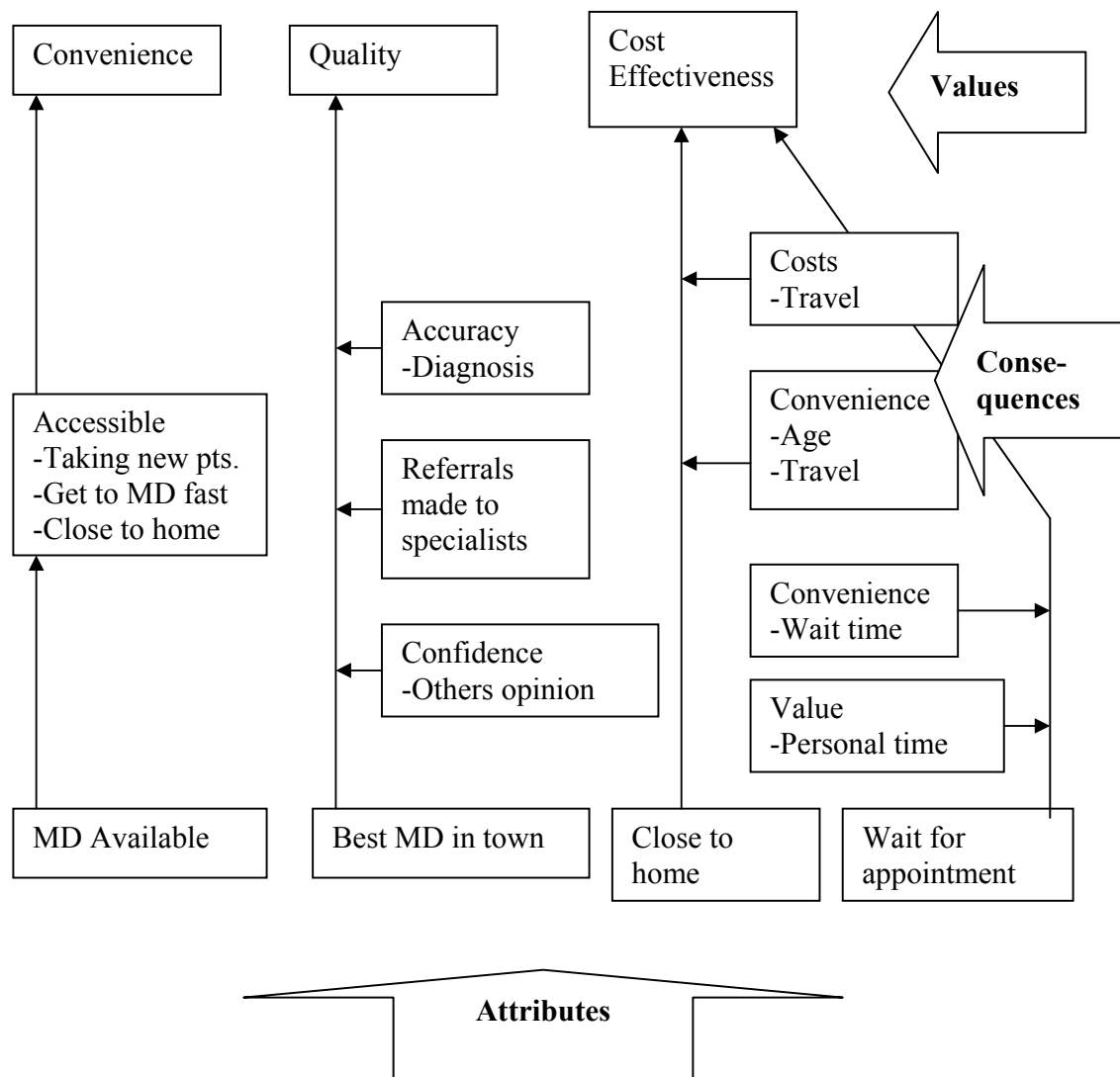


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Future research needs to address how best to achieve linkage between macro-level systemic value and micro-level consumer value. In particular, studies of larger samples of consumers that have been meaningfully segmented on moderating factors are needed. In addition, future research needs to employ more sophisticated analytical techniques for examining the results of laddering interviews and HVM creation. Implications for redesign of health plans and health service delivery organizations to focus on consumer value need to be identified along with new accountability arrangements for maintenance of linkages between consumer and systemic value creation.

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FIGURE 6
TENTATIVE MODEL OF PATIENT SATISFACTION WITH PRIMARY CARE PHYSICIAN



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MOMENTUM CHANGE, SECTOR ROTATION AND RETURNS FROM FIDELITY SECTOR FUNDS

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ABSTRACT

Prior research in the area of momentum investing has shown that over the intermediate term time horizon (three to twelve months), stocks that outperformed in a previous time period tend to outperform in a subsequent time period. It has also been demonstrated that stock returns over the intermediate terms can largely be attributed to the returns in their respective industries. Industry momentum then creates the possibility of creating a momentum based trading strategy using industry or sector funds. A recent study has demonstrated that application of momentum strategy gives superior returns when applied to Fidelity Sector Funds. Another recent study provides evidence that momentum based investment returns can be significantly enhanced by considering change in momentum over two subsequent time periods rather than momentum over a single time period. This study applies change in momentum as a basis for selecting investments in Fidelity Sector Funds. Portfolios are formed based on the changes in quintile rank of returns over two subsequent observation periods, which are then invested over a predetermined hold period. Various observation and hold periods are considered. Using dividend adjusted data for Fidelity Sector Funds for the period 1987 to 2005, the study shows that over the intermediate term time horizon, an investor would have earned significantly higher absolute and risk adjusted returns as compared to those obtained from a simple momentum strategy of buying winners. A dummy variable regression is used to validate that funds with larger increase in relative strength significantly outperform those whose relative strength increased less or decreased.

Introduction

There is a growing body of research on the linkage between a stock's past and future returns. These studies have examined whether relative strength of a stock or industry group over the short, intermediate and long term carries over to future time periods. For the long term time horizon, De Bondt and Thaler (1985) show that stocks that underperformed (outperformed) over any 3-5 years time period tend to outperform (underperform) in the subsequent 3-5 years. On the other hand, recent studies examining the intermediate term time horizons have reported positive correlations between past and future returns.

Jegadeesh and Titman (1993) document that over the 1965 to 1989 sample period, a self financing strategy of creating an equally weighted portfolio consisting of long and short positions in stocks with six month performance in the top and bottom deciles, respectively, produced an excess return of around 1% per month in a subsequent six months hold period. Referred to as the (J, K) strategy, (J=observation period, K=hold pe-

riod), Jagadeesh and Titman (2001) report similar findings when they extend the sample period to 1998. Liu, Strong, and Xu (1999), Rouwenhorst (1998), Ryan and Overmeyer (2004) among others provide international evidence corroborating the results of Jagadeesh and Titman and other studies based on US data.

Moskowitz and Grinblatt (1999) examine a (6,6) momentum strategy using the S&P 500 industry groups and report findings similar to those of Jagadeesh and Titman. Additionally, they show that most of the momentum returns in stocks can be attributed to the momentum in their respective industries. An important advantage of investing in industry groups instead of individual stocks is that it provides additional diversification and cuts down on volatility due to security specific noise. The pitfall, however, is that investment vehicles to carry out industry group rotations such as ETFs or sector funds are not available for all industry groups or subgroups in spite of their proliferations in recent years. This raises the question as to whether benefits of the momentum investment strategy can be achieved

by applying it to a relatively limited number of sectors that are represented in the aforementioned investment vehicles. In view of this, O'Neal (2000) evaluated the performance of a momentum strategy that invested in the Fidelity Sector Funds only. In his research, equally weighted portfolios consisting of the top 3 or top 6 funds were constructed and invested in for the next 6 or 12 months. Results of the study show that the momentum portfolios significantly outperformed a buy and hold strategy of investing in the S&P 500 index for the sample period of May 1989 to April 1999.

In view of the of the De Bondt and Thaler (1985) result of negative serial correlation in the long term performances of securities, Gomes & Islam (2006) conjectured that it may be possible to improve returns over a simple momentum strategy of buying and holding winners by excluding multi-period winners from the hold portfolio. Accordingly, they formed portfolios based on the changes in the quintile rank of returns over two consecutive one year periods for the S&P 500 industry groups and hold them for the subsequent one year period. Their results show that for the 1971-1997 sample period, there is an almost one to one correspondence between rank change and subsequent return. In fact, the portfolio with the largest rank change outperformed the quintile 1 portfolio (top 20% in return) by over 4% and a buy and hold strategy of the S&P 500 index by about 10% per year during the sample period considered.

The purpose of this paper is to apply momentum change as a criterion for portfolio selection to Fidelity Sector Funds. More specifically, we examine if rank change in Fidelity Sector Funds over two subsequent periods are positively correlated with returns in one or more ensuing periods. The risks associated with the portfolios are evaluated, and the reasons why the strategy works are briefly explained.

In Section II, we discuss the data sources and methodological issues. Portfolio returns and some plausible explanations are presented in Section III. Section IV concludes the discussion.

Data and Methodology

The dividend adjusted prices for the Fidelity Sector Funds were obtained from the Yahoo Finance web site. The returns of the S&P 500 index, used as a proxy for the market return, were obtained from the same site. The Treasury bill rates used as proxies for the risk-free rates of interest were obtained from various issues of the Federal Reserve Statistical Bulletin.

The methodology for the study includes the following:

- (1) Compute evaluation period (1 to 24 months) returns for each Fidelity Sector Fund for the period January 1987 through May 2005. These returns are then grouped according to their quintile ranks designated as 1 (best 20%) to 5 (worst 20%)
- (2) For any two consecutive periods of equal length (such as a six month period followed by another six month period), the funds are re-grouped according to changes in their quintile ranks. Accordingly if a fund's quintile rank improves from 5 to 1, its rank has changed by 4 and will be categorized accordingly ($RC=4$) for portfolio selection. Since a fund's quintile rank can increase or decrease, we will have nine portfolio groups with rank changes falling between 4 to -4. ($RC=4$ to $RC=-4$).
- (3) Equally weighted portfolios are then constructed for each RC category and their returns are observed for a predetermined hold period. The strategy involved is designated as a ((JJ), K) strategy where (JJ) represents the two observation periods of equal length and K represents the hold period. For any ((JJ),K) strategy returns are compared across the nine RC categories and the returns obtained from executing a simple momentum strategy (J,K).

Both absolute and risk adjusted returns are computed for each RC classification. The beta coefficient and alpha value for each portfolio are computed by regressing the market model.

$$R_i - R_f = \alpha_i + \beta_i (R_m - R_f) + u_i \quad (1)$$

where R_i is the portfolio return, R_m is the market return, R_f is the risk-free rate of interest and β_i is the market risk of the i^{th} portfolio.

The risk adjusted returns are computed by applying the Sharpe and the Treynor indexes.

$$S_p = \frac{\bar{R}_i - \bar{R}_f}{\sigma_i} \quad (2)$$

$$T_p = \frac{\bar{R}_i - \bar{R}_f}{\beta_i} \quad (3)$$

where \bar{R}_i and \bar{R}_f are the mean portfolio return and risk-free rate of interest for the relevant holding period, and σ_i is the portfolio standard deviation.

To determine whether rank change do make statistically significant contribution to portfolio return, we run the following dummy variable regression

$$R_i = b_0 + b_1 (R_m - R_f) + a_4 D_4 + a_3 D_3 + \dots + a_{-3} D_{-3} \quad (4)$$

where R_i is the return of the i^{th} rank change portfolio, $i = 4$ to -3 , D_i are the dummy variables, and a_i represent the shift parameters.

Results

In Table 1 and 2, we present the average annual returns obtained from applying several simple momentum strategies and momentum change strategies. In Table 1, the numbers under the (6, 6) column show returns from buying the funds with six month quintile rankings of 1 through 5, and holding them for the subsequent six months. Similar explanations apply to other columns. The results show that the momentum strategy does give superior returns. For each of the observation and hold period examined, quintile 1 portfolio provides the best returns, and returns decline as ranks decline.

TABLE 1 SIMPLE MOMENTUM STRATEGY AVERAGE ANNUAL RETURNS: 1987-2005				
Quintile	6, 6	6, 12	12, 6	12, 12
(best) 1	19.75%	19.08%	21.28%	18.34%
2	18.10%	17.41%	16.47%	16.60%
3	14.30%	14.44%	15.48%	15.15%
4	12.18%	13.85%	14.28%	15.29%
5	10.96%	12.04%	11.55%	14.61%

In Table 2, returns obtained from some intermediate term momentum change strategies are given. The numbers under the ((66),6) columns show the returns pertaining to portfolios constructed based on rank changes over two consecutive six month observation periods, and a subsequent six month hold period. Similar explanations apply to other columns. As is obvious, portfolios with the largest momentum change (RC=4) gave the best returns followed closely by rank improvements of 3 and 2. Also, except the ((66), 6) strategy where returns are similar to the returns under the (6, 6) strategy, the ((JJ), K) strategies with rank improvements of 2 or better gave returns that at least equaled the best returns under the (J, K) strategy. (Note that the difference between 18.97% return of the RC=2 portfolio for the ((66),12) strategy and the 19.07% return for the quintile 1 portfolio under the (6,12) strategy was found to be statistically insignificant). Also (except the ((66),6)

strategy), the best returns under the ((JJ), K) strategies outperformed those of the (J, K) strategies by 3.3% to 4.64% annually. It is important to note that in addition to superior returns, the ((JJ), K) portfolios with RC=2 or better provide more diversification (reducing risk) as they include more sectors. Also the portfolio choices now include some less than stellar performers in previous periods such as those belonging to quintile ranks of 3 or 2 but whose ranks have improved from 5 to 2 or 3, and 4 to 2. Importantly, the longer observation and hold periods provided better returns.

TABLE 2 RANK CHANGE STRATEGY AVERAGE ANNUAL RETURNS: 1987-2005				
Rank Change	((66), 6	((66), 12	((1212), 6	((1212), 12
4	18.63%	22.38%	25.84%	22.51%
3	17.94%	19.91%	22.17%	21.95%
2	17.15%	18.97%	21.26%	22.16%
1	14.39%	15.31%	18.01%	17.09%
0	15.93%	15.80%	14.54%	13.54%
-1	16.26%	15.36%	13.98%	14.08%
-2	15.34%	14.41%	13.73%	13.42%
-3	15.10%	14.72%	10.53%	11.75%
-4	9.09%	9.02%	13.26%	15.91%

To see, how risk and returns are related we computed the Sharpe and Treynor indexes for each of the momentum change portfolios shown in Table 2. In the interest of space, only the computations for the ((1212),12) portfolios are shown in Table 3. Note that for the RC=4 portfolio, market risk is almost non-existent. To a lesser extent the same applies to RC=3 and RC=2 portfolios. Also, as expected the risk adjusted returns as measured by the Sharpe and Treynor indices get larger as rank changes get larger, with the largest improvement registered by the RC=4 portfolio.

To see, if the differences in the portfolio returns are statistically significant, the results from the dummy variable regression for the ((1212), 12) portfolios are given in Table 4.

For this strategy positive and statistically significant shifts occur for rank changes of 2 or larger. Shifts associated with rank change of 1 or lower are either negative or statistically insignificant with the exception of the constant term representing the RC= -4 portfolio. However, annualized return for this portfolio is much lower than the RC=2 to RC=4 portfolios.

TABLE 3
RISK ADJUSTED RETURNS
RANK CHANGE STRATEGY ((1212), 12): 1987-2005

RC	Mean HP % Return	Standard Deviation	Annualized HP Returns%	Sharp Ratio	Beta	Alpha	Treynor Ratio
4	22.51%	30.31%	22.51%	0.5855	0.1672	19.72%	106.13
3	22.35%	28.51%	22.35%	0.6169	0.5713	17.24%	30.79
2	21.68%	23.46%	21.68%	0.7211	0.6890	16.09%	24.55
1	16.95%	16.31%	16.95%	0.7470	0.7447	11.24%	16.36
0	13.64%	18.80%	13.64%	0.474	0.8432	7.39%	10.53
-1	14.12%	17.32%	14.12%	0.5403	0.7612	8.31%	12.29
-2	13.72%	17.82%	13.72%	0.5029	0.7455	7.93%	12.02
-3	11.93%	22.20%	11.93%	0.3230	0.8372	5.05%	8.57
-4	17.39%	32.52%	17.39%	0.3883	1.0499	7.25%	12.03

To summarize, we have shown that over the intermediate term portfolio choice based on momentum improvement generally provide returns much superior to a simple strategy of investing in the winners of any given period.

TABLE 4
DUMMY VARIABLE REGRESSION

Rank Change	Coeffi- cients	T Statistics	Signifi- cance
Constant	0.0906	5.1755	0.0000
4	0.0678	2.7879	0.0054
3	0.0671	2.9313	0.0034
2	0.0629	2.8096	0.0050
1	0.0177	0.7900	0.4296
0	-0.0156	-0.6959	0.4866
-1	-0.0107	-0.4795	0.6317
-2	-0.0154	-0.6864	0.4926
-3	-0.0392	-1.6978	0.0898

Various explanations have been offered in the literature to explain why momentum strategy works. One of the popular reasons is the slowness of the discounting process. It has also been argued that earnings momentum lead stock price momentum; but psychological reasons such as doubts, suspicion, fear, wait and see attitude, etc. contribute to the slowness in the earnings to be reflected in stock prices. In the present paper we have shown that the market risk of the top RC portfolios, especially the RC=4 portfolio is very small. It is highly likely that these winning portfolios are representing special situations. One example may be the stellar performance of the various financial subgroups during the 1980's due to declining trend of interest rates for a long period of time. In the late 1970's their stock prices were depressed due to high interest rates creating pessimism regarding

their prospects. But when interest rate started falling, pessimism did not go away instantly. Due to a myriad of factors such as uncertainties regarding the prospects of interest rates to continue falling, unfavorable comments by investment advisors etc., buyers came slowly. As confidence built up over time and the sectors moved from the bottom quintile to the top, more buyers became interested. The process continued until enough buyers contributed to the groups' valuations becoming closer to their intrinsic values whence momentum slowed down. Recent momentum in the industrial material sectors is another case in point. Strength in Asian and Latin American economic growth is not only contributing to strong industry momentum, but continued strength in the former are bringing in new buyers whenever small corrections in stock prices are occurring causing volatility to stay low. Energy related stocks are telling a similar story, especially for the oil service sub-sector due to capacity shortage in the industry. To summarize, we believe that although the reasons available in the literature for momentum continuation, do have merit, no definitive reason has been advanced. What we believe to have added to the rationale is that the low volatilities associated with sectors exhibiting large increases in relative strength point to unique kinds of special situations. It should also be noted that, a sector may be fairly valued currently, but its intrinsic value itself may keep on going up if favorable industry circumstances become even more favorable. In such situations, momentum continuation is possible even if the discounting process is not slow.

. Conclusions

The strategy of investing in Fidelity Sector Funds based on large rank improvements over the two previous time periods and hold them over subsequent periods gener-

ally provided better returns than simply buying and holding the winners for the sample period considered in this paper. In general, we found that larger absolute and risk adjusted returns are associated with larger rank changes. While this is our principal result, we have also shown that these portfolios have low risk which leads us to believe that special industry situations are critical in explaining momentum related returns and that such returns do not necessarily have to be explained by the slowness of the discounting process.

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SEPARATING EXOGENOUS COUNTRY PRODUCTIVITY DIFFERENCES AND FACTOR-SPECIFICITY EFFECTS

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ABSTRACT:

The study of productivity differences across countries has become a topic of interest in the empirical trade literature. Adding to the large body of literature on total factor productivity (TFP), much of the writing in empirical trade has moved away from the assumption of identical technology and now estimates productivity differences in an attempt to explain trade patterns. The primary emphasis in the trade literature has been on exogenous productivity differences. This paper explores factor reallocation costs, as another potential cause of productivity variation across countries. After deriving a model by which to separate exogenous country productivity differences from reallocation costs, the relative importance of productivity loss due to factor movement is estimated using input-output tables and reallocation data from the United States and Peru.

Introduction

The Heckscher-Ohlin international trade model fails to explain observed trade patterns, despite being the workhorse model for the field. This failure has focused attention in on the assumption of identical technology across countries. Work by Treffer (1995) and Davis and Weinstein (2001) have used estimates of productivity differences across countries to greatly improve the model's ability to explain trade in factor services. To date, most studies of the international trade effects of cross-country productivity differences have combined all variation under the heading "technology differences." This approach obscures the fact that these productivity differences come from various sources: technological advances across time, exogenous country differences, and relative factor reallocation between industries. This final explanation will be the focus of the following paper.

There are two branches of TFP literature that examine the country-specific explanations for variation in productivity. The first type explores the actual sources of these country differences primarily by case study, either looking at a cross section of several industries or studying changes in productivity in a few industries across time.¹ Among the effects found to be significant in explaining productivity differences are investment in fixed capital, capacity utilization, energy prices, and tax policies, and human capital growth rates. However, Prescott (1998) emphasizes the lack of a theory of total factor productiv-

ity (TFP). While most writers have noted the existence of TFP variations across countries without analyzing their roots, Prescott demonstrates that differences in saving rates, physical capital per laborer, and human capital accumulation rates are insufficient to explain current differences in per capita income.

The other branch in the literature does less to explore the source of the country-specific effects and more to emphasize and estimate their importance in production and trade. In his 1995 paper, Treffer estimates country differences in productivity by estimating the relative productivity of less developed countries to industrialized economies. Even with the restriction that the relative productivity of all factor types, changes by the same proportion across industries, his allowance for country differences greatly improves the heretofore abysmal performance of the Heckscher-Ohlin trade model. Harrigan (1997) extends this approach, allowing for varied relative productivities in each industry across countries for each of seven industries in 10 industrialized countries. Davis and Weinstein (2001) take the analysis a step farther: since their data set includes technology matrices for OECD countries ($A_c \forall c \in \text{OECD}$), they have a measure of productivity differences. While of these papers make important advances in improving the fit of the neoclassical trade models, they do not include the cost of factor reallocation between industries, a factor-specific effect, when they consider these productivity differences.

The importance of factor reallocation is noted in Jorgenson (1988), in which he studies productivity changes in

¹ As exemplified by Jorgenson, Gollop, and Fraumeni (1987), Dougherty and Jorgenson (1996) and Jorgenson and Kuroda (1992).

the United States and Japan during the period 1960-79. Jorgenson finds that an important source of aggregate productivity gains is the increase in efficiency from intersectoral reallocation of resources and output during 1960-73. An unstated conclusion may be drawn: countries with institutional rigidities that prevent reallocation will not realize the efficiency gains (a significant consideration in the case of Peru). Furthermore, in keeping with factor specificity, reallocation costs will limit the achievable advances from adjustment.

In the next section, how country-differences would manifest themselves in the observed unit factor coefficients is outlined. The impact of factor-specificity is then explained by defining an effective unit factor coefficient that varies from the physical (observed) unit factor coefficients as inputs are transferred between industries over time. Using the insights from the following two sections, a method is proposed by which to distinguish factor effects from exogenous country effects on productivity.

Productivity Differences Across Countries

In the large number of studies on the subject, country-specific variation in productivity is attributed to causes such as differences in human capital, institutions, factor markets, and technology. Beyond country characteristics, however, factor specificity can cause two countries that are equal in all other respects to have different measures of productivity in the aftermath of reallocation. The transfer of a factor between industries temporarily reduces productivity of that factor relative to units already located in the industry. This productivity cost of reallocating factors between industries, even if constant across countries,² will manifest itself differently in aggregate since economies will engage in distinct degrees of reallocation.

Measuring Productivity

To clarify the sources of productivity variations, first establish the difference between effective and physical factors. In period t , L_{cit}^e and K_{cit}^e are the effective, or fully productive, factor units used in production of a representative good i in economy c , whereas L_{cit} and K_{cit} are the physical factors. While the physical factors are observable, the production of the representative good X depends on the number of effective factors used:

$$X_{cit} = F_{it}(L_{cit}^e, K_{cit}^e)$$

² If costs are not constant across countries then the variation may be due to institutional differences that would be captured by measures of country differences.

Assume the production function is homogeneous of degree one. Specifically, impose a Cobb-Douglas functional form such that

$$X_{cit} = A_{it}(L_{cit}^e)^{\alpha_i}(K_{cit}^e)^{1-\alpha_i} \quad (1)$$

The number of effective factor units may differ from the number of physical factors employed by the industry as a result of exogenous country differences in productivity or costly reallocation of factors. However, when all physical factors are fully productive, then the number of physical and effective factors is the same. As a result of the assumed constant return to scale technology, and with common technology parameters A_{it} and α , the optimal production technique in effective units will be the same across all countries. The issue of interest, therefore, is how the physical and effective factors differ within a country.

The means by which productivity is measured is by calculating unit factor coefficients. The *Effective Unit Factor Coefficient* (EUFC) is the number of effective factors needed to produce one unit of output:

$$a_{Lit}^{ec} = \frac{L_{cit}^e}{X_{cit}} \quad \text{and} \quad a_{Kit}^{ec} = \frac{K_{cit}^e}{X_{cit}}$$

so that the unit production function is

$$1 = A_{cit}(a_{Lit}^{ec})^{\alpha}(a_{Kit}^{ec})^{1-\alpha} \quad (2)$$

The *Physical Unit Factor Coefficient* (PUFC) is the number of physical factors used in production of one unit of output in a given country in period t :

$$a_{Lit}^c = \frac{L_{cit}}{X_{cit}} = \frac{L_{cit}}{A_{cit}(L_{cit}^e)^{\alpha}(K_{cit}^e)^{1-\alpha}} \quad (3)$$

and

$$a_{Kit}^c = \frac{K_{cit}}{X_{cit}} \quad (4)$$

The effective unit factor coefficients, a_{jit}^{ec} , are unobserved; only the physical coefficients are directly observable. The assumption is made that underlying technology, i.e., the production function as expressed in effective factors, is identical for all countries for a given period. The observed physical factor-use varies across countries as the PUFC deviate from EUFC within a country either due to exogenous country differences in productivity or reallocation costs. Higher values of a_{jit}^c indicate lower average productivity of factor j in the i^{th} sector as it takes more of the (less productive) factor to produce one unit of output. Therefore, a less productive country would typically have higher a_{jit}^c across $i \in N$ and $j = L, K$.

The focus of this paper is to outline how omitting reallocation effects will misrepresent time effects and exogenous productivity differences across countries.

The typical measure of productivity in international comparisons is total factor productivity (TFP). Changes in TFP measure a shift in the production function: increases in output due to some change apart from variation in the quantity of inputs employed. Therefore, TFP comparisons measure variations in A_{jt} across countries or across time. Changes in TFP impact the unit factor coefficients as output variations are not accompanied by proportional change in factor use. Inasmuch as reallocation costs imply the introduction at the margin of less productive new factor units. Therefore, when the assumption is mistakenly made that factor movement is costless, the apparent differences in TFP across countries may be picking up the changes in the average productivity of factors due to reallocation.

Due to factor specificity it is plausible that a country may look less productive in the short run while moving resources into comparative advantage areas, so that $a_{jit}^c < a_{jit}^{ec}$ for reallocated factor j . Furthermore, the economy may display what appears to be country-specific productivity growth, which in reality should be attributed to the productivity gains of reallocated factors and is independent of exogenous country differences in productivity. The variation in productivity due to reallocation is the focus of this paper. I consider the unit factor coefficients derived from the input-output tables of Peru and the United States from several years and estimate the degree of variation attributable to reallocation, thereby separating the country-specific and factor-specific differences in productivity.

Exogenous Country-Specific Productivity Differences

Country-specific characteristics can either augment or diminish productivity. An economy with high savings rates, universal education and political stability has higher growth rates than the economy with high public dissavings, low human capital, and political or social instability. In this analysis, the more productive country is assumed to be the norm. The less productive country incurs productivity losses as the cost of its policies, institutions, history, etc.³ The costs of various “negative” characteristics do not fall equally on each factor type. Low human capital may have an effect on the productivity of physical capital, but clearly has a stronger impact on labor productivity. To capture both direct and indi-

rect effects of country-specific characteristics, I again define an effective or fully productive factor according to the production function of an industry. The period subscript is suppressed in this section.

In the absence of reallocation, define $\phi_j^c < 1$ as the relative productivity of factor j in the less productive country c , so that $(1 - \phi_j^c)$ is the productivity-loss cost to the factor in that economy. By construction, the more productive country C has $\phi_j^C = 1$. An effective factor unit is then defined as fully productive. Therefore, for country c with physical factor endowment of L_c , the productivity adjusted labor force available for production is the effective labor $L_c^e = (\phi_L^c)L_c$.

Assume that countries produce output using the same effective technology, but production is determined by the effective labor force and capital stock employed. Two commodities are produced in each economy. Consider production in the poorer country (suppressing the country and time subscript for the moment). The first commodity is both a final and an intermediate good such that

$$X_1^T = X_1^F + X_1^I = F_1(L_1^e, K_1^e), \quad (6)$$

where X_1^F is the portion of total product used for consumption and X_1^I is the portion used in the production of the second commodity. The production function for X_2 , therefore, is given by

$$X_2 = F_2(L_2^e, K_2^e, X_1^I), \quad (7)$$

Production is homogeneous of degree one in all inputs. Assume full employment of physical factors in both countries.

Under the assumptions of constant returns to scale technology and common international prices, the unit production functions hold for both countries:

$$1 = F_1(a_{L1}^e, a_{K1}^e) \quad (8a)$$

$$1 = F_2(a_{L2}^e, a_{K2}^e) \quad (8b)$$

The effective unit factor coefficient (EUFC), a_{ji}^e , indicates the number of fully productive factor units necessary to produce one unit of commodity i . This concept differs from the measured, or observed, physical unit factor coefficient (PUFC) whenever there are country-specific productivity costs. As explained above, the PUFC is the total factor j used in production of each unit of output. For labor, the PUFC's for the two commodities are defined as:

³ For example, see Barro (1991) and Siemann (1998).

$$a_{1L} = \frac{L_1}{X_1^T} \quad (9a)$$

$$a_{2L} = \frac{L_2 + L_1 \left(\frac{X_1^I}{X_1^T} \right)}{X_2} \quad (9b)$$

The PUFC's for capital are calculated similarly. Note that the PUFC's for commodity 2 include both those factor units used directly in production as well as those embodied in the intermediate good.

The effective unit factor coefficients of a country are defined as the effective factor use per unit of output, correcting for the relative productivity of factors located in that country:

$$a_{1L}^e = \frac{L_1^e}{X_1^T} = \frac{\phi_L L_1}{X_1^T} \quad (10a)$$

$$a_{2L}^e = \frac{L_2^e + L_1^e \left(\frac{X_1^I}{X_1^T} \right)}{X_2} = \phi_L \left[\frac{L_2 + L_1 \left(\frac{X_1^I}{X_1^T} \right)}{X_2} \right] \quad (10b)$$

The inclusion of an intermediate good demonstrates how the costly effects of country characteristics can filter through the industries in an economy. This point becomes especially pertinent when distortionary policies are in place such that the productivity costs become industry specific so that ϕ_{Li}^c varies across industries.

Again, studies of variation in total factor productivity are intended to measure ϕ_{ji}^c . Returning to the Cobb-Douglas production function, differences in ϕ_{ji}^c across countries causes a change in the intercept of the function. Defining A_i as a common production parameter across countries, then according to the formulation above, A_{ci} is estimated in studies of TFP such that:

$$\begin{aligned} X_{ci} &= A_i (L_{ci}^e)^{\alpha_i} (K_{ci}^e)^{1-\alpha_i} \\ &= A_i (\phi_{Li}^c)^{\alpha_i} (\phi_{Ki}^c)^{1-\alpha_i} (L_{ci})^{\alpha_i} (K_{ci})^{1-\alpha_i} \\ &= A_{ci} (L_{ci})^{\alpha_i} (K_{ci})^{1-\alpha_i}. \end{aligned} \quad (11)$$

Given the assumptions that effective technology is identical across countries, and that the production function is linearly homogeneous in effective factors, the two economies will choose the same production technique in effective factors when facing common international relative prices and effective factor price equalization.⁴ If w and r are the payment to labor and capital respectively,

so that each effective factor in country c is paid $\phi_L^c w$ and, $\phi_K^c r$ the EUFC will be:

$$a_{ji}^{e*}(\phi_L w, \phi_K r) = a_{ji}^{ec} = a_{ji}^{eC}, \quad (12)$$

for $i=1, 2$ and $j=L, K$.⁵ The fact that effective technology is the same across countries does not imply that the PUFC will be equal. In fact, if either ϕ_j^c or ϕ_j^C is less than unity for $j=L$ or K , it cannot be the case that $a_{ji}^c = a_{ji}^C$ in equilibrium.⁶

Factor-Specificity Effects

As demonstrated above, two countries identical in all aspects but institutions may display differing degrees of factor productivity as economies are more or less able to respond to changes in the trade environment. There is another source of productivity differences that results from the effect of specificity: factors cannot be transferred between industries without cost. This cost of reallocation is modeled here as a loss in productivity upon movement into a new industry relative to those factors already located in that industry.

The concept of factor specificity in this context has been addressed by Mayer (1974), by Mussa (1978), and by Grossman (1983). However, in each of these theoretical papers only capital was modeled as partially mobile. Labor was assumed to be perfectly mobile. In reality, however, labor and capital both experience a period of reduced productivity when moved into an industry. Conway (2002) incorporates partial factor mobility into the Heckscher-Ohlin model and derives the predicted impact of reallocation costs on international trade flows. He finds that allowing for factor immobility improves the fit of the HO model, relative to the fit when variations in production are based on country differences only.

Define η_{js} as the productivity of factor j in the s^{th} period after reallocation relative to fully productive factors already in the industry. It is assumed that $\eta_{js} < \eta_{js+1}$ ⁷

⁵ Proof available upon request.

⁶ Returning to the original assumption that $\phi_j^c = 1$ and $\phi_j^C < 1$ for $j=L, K$, note that $a_{Li}^{ec} = a_{Li}^{eC}$ implies that $a_{Li}^c = \phi_L^c a_{Li}^C$. Therefore, for $\phi_L^c < 1$, it must be that $a_{Li}^c > a_{Li}^C$, indicating that production of one unit of commodity i requires more physical units of labor in country c than in C as a result of country-specific characteristics which determine the relative size of ϕ_j^c .

⁷ The actual movement of η_{js} over time is a matter to be settled empirically. However, modeling this process should include a progressive movement toward full productivity. Potential models could include such changes over time as $\eta_{js} = 1 - (\eta_{js-1})/2$. Alternatively, the relative productivity may

⁴ The assertion of effective factor price equalization is supported by Golub (1996) and Treffer (1993).

and $0 \leq \eta_{js} \leq 1$ for all $s \in [0, \tau]$, where τ represents the number of periods necessary for the reallocated factor to achieve full productivity. According to this notation, η_{j0} is the relative productivity of a factor reallocated in the current period and η_{j1} is the relative productivity of a factor reallocated in the previous period etc. Therefore, if a_{ji}^e represents the number of fully productive factor units needed to produce one unit of commodity i , then a_{ji}^e / η_{j0} represents the number of less productive recently reallocated factors necessary to produce that unit. If the home economy has experienced a larger adjustment, so that a greater proportion of the factors in an industry have been reallocated, the average productivity of factors will fall in that industry relative to the average productivity in the foreign industry.

Assuming that factors are less productive for τ periods after reallocation, production in a given industry (industry subscript omitted) is determined by the number of productivity-adjusted effective factors in an industry, rather than the number of physical factors:

$$X_t = F(L_t^e, K_t^e) \quad (13)^8$$

$$L_t^e = L_{t-\tau-1} + \sum_{s=0}^{\tau} \eta_{Ls} l_s \quad (14a)$$

$$K_t^e = K_{t-\tau-1} + \sum_{s=0}^{\tau} \eta_{Ks} k_s \quad (14b)$$

where l_s and k_s are the factors that have been reallocated into the industry in the $t-s$ period. $L_{t-\tau-1}$ and $K_{t-\tau-1}$ represent the fully productive portion of the labor force and capital stock. The impact of reallocation and movement to full productivity over time is demonstrated graphically in Figure 1.⁹ Since there is a difference between physical and effective factors, there is an analogous difference between physical and effective unit factor coefficients. As defined above, the physical unit factor coefficient is $a_l = L/X_t$ for labor and $a_k = K/X_t$ for capital. The effective unit factor coefficient is defined according to the effective factor use. For labor:

follow a logarithmic process. Define the parameter $b_{js} \in [1, e]$. The interval $[1, e]$ is divided into the number of periods (τ) necessary to reach full productivity, such that $\beta_{j0} \geq 1$, $\beta_{j\tau} = e$, and $\beta_{jt}/2 = (e-1)/2$. The parameter η_{js} is then defined by $\eta_{js} = \ln(\beta_{js})$.

⁸ Here L_t^e and K_t^e represent total effective labor and capital used in production, including those factors embodied in intermediate goods.

⁹ In reality there is every reason to expect that τ will be different for labor and capital, but for sake of clearer notation, it is assumed constant across factors.

$$a_{Lt}^e = \frac{L_t^e}{X_t} = \frac{L_{t-\tau-1} + \sum_{s=0}^{\tau} \eta_{Ls} l_s}{X_t} \quad (15)$$

The EUFC embodies the true description of the technology used, independent of the reallocation/adjustment that has taken place. The PUFC understates a country's productivity in an industry if there has been any history of reallocation in the previous period and if $\eta_j < 1, j=L$ or K . For labor:

$$a_{Lt} - a_{Lt}^e = \frac{\sum_{s=0}^{\tau} (1 - \eta_{Ls}) l_s}{X_t} > 0 \quad (16)$$

The PUFC that is used as a measure of productivity assumes all labor is fully productive. Therefore, average output per worker ($1/a_{Lt}$) appears lower since the physical labor force is larger than the effective labor force. The difference in the EUFC and PUFC described in equation (16) is depicted graphically in Figure 2.

The effects of factor specificity, and the resulting deviation of the EUFC from the PUFC, can explain why country productivities appear different. Even if the underlying technology/productivity is the same for both countries, a country that has done more reallocation will appear less productive, as a greater proportion of its labor force is less than fully productive.

Assuming common linearly homogeneous technology and international prices, it follows that the two economies will choose the same *effective* technique. However, although $a_{Lt}^{ec} = a_{Lt}^{ec}$, the measure of PUFC may differ across countries. Restating the PUFC,

$$a_{Lt}^c = a_{Lt}^e + \frac{\sum_{s=0}^{\tau} (1 - \eta_{Ls}) l_s^c}{X_t^c} \quad (17)$$

and noting that the EUFC is equal across countries, in order to observe $a_{Lt}^c = a_{Lt}^c$ it must be the case that

$$\frac{\sum_{s=0}^{\tau} (1 - \eta_{Ls}) l_s^c}{X_t^c} = \frac{\sum_{s=0}^{\tau} (1 - \eta_{Ls}) l_s^C}{X_t^C} \quad (18)$$

In other words, for the entire $t-\tau$ to $t-s$ history the two countries would have to reallocate the same proportion of their effective labor forces.

Mismeasurement of Total Factor Productivity

As stated earlier, without correcting for differences in reallocation, studies of TFP variation across countries will mistakenly include these reallocation costs in the measure of country-specific differences in productivity.

Again, A_{0i} represents a common production parameter for all countries, while A_i includes the country-specific components f_L^c and f_K^c . Define two additional terms:

$$\lambda_{cit} = \frac{L_{cit}}{L_{cit}^e} = \frac{L_{cit}}{L_{cit-\tau-1} + \sum_{s=0}^{\tau} \eta_{Ls} L_{cis}} \geq 1 \quad (19a)$$

$$\kappa_{cit} = \frac{K_{cit}}{K_{cit}^e} = \frac{K_{cit}}{K_{cit-\tau-1} + \sum_{s=0}^{\tau} \eta_{Ks} K_{cis}} \geq 1 \quad (19b)$$

Then for country c the measure of the PUFC for labor in industry i may be stated as

$$a_{Lic} = \left(\frac{L_{cit}}{A_{cit} L_{cit}^{\alpha} K_{cit}^{1-\alpha}} \right) \lambda_{cit}^{\alpha} \kappa_{cit}^{1-\alpha} \quad (20)$$

For $\eta_{js}=1, j=L, K$ and $s=0, \dots, \tau$, reallocation is costless and the last two terms are equal to unity so that changes in A_{cit} captures only changes in production unexplained by variation in inputs. However, if $\eta_{js} < 1$, then λ_{cit} and κ_{cit} are both greater than unity. In this case, changes in the PUFC not explained by changes in physical factor use include both the measure of change in TFP (ΔA_{cit}) and the measure of productivity loss due to reallocation ($\Delta \lambda_{cit} + \Delta \kappa_{cit}$).¹⁰ As Jorgenson and Griliches (1995) observe, the approach of treating TFP as a residual that is estimated and not explained can be a dangerous practice, because it may ignore other explanations of productivity changes.

Separating Exogenous Country Productivity Differences and Factor-Specificity Effects

As demonstrated above, the perceived productivity differences across countries may be explained by either exogenous country-specific characteristics or by the incidence of adjustment costs. The most general and likely scenario is that variations in productivity result from a combination of both country-specific and factor-specific effects. The physical unit factor coefficient, therefore, can be stated as a function of both ϕ_j^c and η_j . The relevant issue then becomes how to separate the two effects in an empirical study of productivity differences.

10 Note that the changes in λ_{cit} and κ_{cit} may be attributed to various sources related to reallocation: (1) change in productivity of reallocated factors as tenure increases toward τ , (2) variation across countries in the percentage change of industry i labor force or capital stock, or (3) variation in η_{js} across countries. The last explanation is not addressed here, though note that the same types of explanations for $A_{cit} \neq A_{Cit}$ could be used to explain why $\eta_{js}^c \neq \eta_{js}^C$.

To simplify notation, the industry subscript is omitted. Furthermore, assume output is produced according to a standard Cobb-Douglas production function, where A_0 and α is the industry specific parameter common to all countries. The PUFC for an industry is determined by both factor and country-specific effects, as both influence output:

$$a_{Lt}^c = \frac{L_{ct}}{X_{ct}} = \frac{L_{ct}}{A_{0t} (L_{ct}^e)^{\alpha} (K_{ct}^e)^{1-\alpha}} \quad (21)$$

Separating country-specific and factor-reallocation effects, this equation becomes:

$$a_{Lt}^c = \left[\frac{L_{ct}}{A_{0t} (\phi_L^c)^{\alpha} (\phi_K^c)^{1-\alpha} (L_{ct})^{\alpha} (K_{ct})^{1-\alpha}} \right] \lambda_{ct}^{\alpha} \kappa_{ct}^{1-\alpha} \quad (22)$$

where $\lambda_{ct} = L_{ct} / (L_{ct-\tau-1} + \sum_{s=0}^{\tau} \eta_{Ls} L_{cs})$, a proxy for the cost of reallocating labor. κ_{ct} is similarly defined. For $\eta_{js}=1, j=L$ or $K, s=1, \dots, \tau$, the two terms λ_{ct} and κ_{ct} are equal to unity as there are no productivity losses due to the transfer of factors, and hence no negative impact on the PUFC.¹¹

Measurement of TFP differences across countries attempts to estimate the term $A_{ct} = A_{0t} (\phi_L^c)^{\alpha} (\phi_K^c)^{1-\alpha}$ from equation 20, but assumes $\lambda_{ct} = \kappa_{ct} = 1$ by ignoring reduced productivity of reallocated labor and capital. Instead of estimating A_{ct} , therefore, the term estimated is $A_{ct} / (\lambda_{ct}^{\alpha} \kappa_{ct}^{1-\alpha})$. Since λ_{ct} and κ_{ct} are greater than unity if $\eta_{js} < 1$ for $j=L, K$ and $s \in [0, \tau]$, the total factor productivity of country c is understated.

The potential mismeasurement of country-specific differences in productivity is now addressed, using manufacturing data for the United States and Peru over the years 1980-1988. The choice of countries and timeframe is deliberate: it is quite rare for a developing economy to have consistent time-series input-output tables necessary for productivity comparisons of the nature discussed here. During this time period, Peru did publish input-output tables of sufficient consistency and disaggregation to allow for comparison to the United States, hence

11 The Heckscher-Ohlin trade model assumes that $\lambda_{ct} = \kappa_{ct} = 1$, as well as $\phi_j^c = \phi_j^C, j=L, K$. The application of this assumption has been extended to testing the factor proportions model of trade by using the United States unit factor coefficients. For example, it has been standard practice to apply a_{Lt}^{US} to all countries. However, if $\phi_j^{US} > \phi_j^c$, ignoring country-specific differences in productivity will overstate the productivity of country c . On the other hand, if $\lambda_{US} > \lambda_{US^c}$ or $\kappa_{US} > \kappa_{US^c}$ are greater than unity, ignoring reallocation costs will understate U.S. factor productivity. Furthermore, if either $\lambda_{ct} \neq \lambda_{US^c}$ or $\kappa_{ct} \neq \kappa_{US^c}$ due to variation in degree of reallocation across countries, the United States' PUFC will either over- or understate foreign productivity.

its inclusion. The U.S. economy during the time period under consideration is familiar to most. Peru, however, has experienced a number of regime shifts, outlined below, which must be taken into account when comparing changes in relative productivity.

The Peruvian Economy, 1980-1990

Since the end of the import-substitution programs that had been in place from 1968 to 1975, the per capita income of Peru has not grown between the years 1975-1990, although the situation worsened considerably in the years 1988 and 1989 with a cumulative 20% decline in GDP during those two years. When the Latin American debt crisis hit Peru in 1983, GDP fell that year, with a slight increase in the following two years. Over the years 1980-1985, however, per capita income fell by an average of 3.9% per year. The decade was further characterized by high inflation, which reached a peak of 2775% in 1989, and high levels of both unemployment and underemployment, which together rose to 75% in late 1989. Serious price distortions were introduced as the government held down the prices of public goods in the face of high inflation rates.

Labor markets were rigid due to unionization and regulation of hiring/firing practices. Furthermore, estimates by Hernando De Soto (1986) put 48% of the labor force and 61.2% of the labor hours in the informal sector. An estimated additional 38.9% of the official GDP represents goods and services produced by the informal sector. Finally, with the beginning of the debt crisis in 1983 and the subsequent default on its loans, Peru effectively lost access to the world capital markets for the duration of the decade. Gross fixed capital investment fell during this period as the political, social, and legislative instability lead to a precipitous fall in foreign direct investment as well as private investment. The volatility of government policy made it particularly difficult for businesses to make any long-term production plans necessary for capital accumulation decisions.

Although land is not a factor of production considered in this paper, it should be noted that property rights are poorly defined, resulting in a market for land that is inefficient as well.

Productivity Differences between the United States and Peru

Data

The data come from two primary sources. Input-output tables for the United States and Peru cover the three years 1982, 1985, and 1988. The manufacturing submatrix of these input-output tables are used to construct the a_{ij} , j =manufacturing labor and capital.¹² Factor use by industry, in addition to two period changes in factor use, are derived from the United Nations Industrial Statistics Yearbook from the years 1980-1988. The years selected were chosen by data availability and because the period 1982-1988 represents a time of relative institutional stability in Peru. Although the entire manufacturing sector is represented in the data, in order to establish concordance between the U.S. and Peruvian input-output tables, it is necessary to aggregate to the 16 industries (listed in Table 1). All capital stock and output values are converted into 1990 dollars. In the regressions, all values are expressed as shares of real GDP.

Approach

As described in the previous section, variation in productivity is attributed to three sources: technological advances over time, exogenous country differences, and reallocation effects. It is hypothesized that ignoring the costs of factor reallocation results in the mismeasurement of time and exogenous country effects. The goal in this section is to compare two measures of country differences in productivity. The first follows the literature and measures productivity without accounting for factor-specificity effects. The second measure is estimated after removing the impact of reallocation costs. The theory provides no prediction about whether the exogenous country differences will be larger or smaller after removing reallocation costs. To clarify, consider the following scenario. According to comparisons of PUFC, the United States is more productive than Peru. If the United States has engaged in a greater proportion of reallocation, correcting for factor-specificity costs will cause the United States EUFC to fall more relative to the fall in Peru's unit factor coefficient. Therefore, the gap between the United States' and Peru's productivity is greater. On the other had, if the Peruvian economy has experienced greater relative expansion of its manufacturing sector, the Peruvian EUFC will fall relatively more than the United States', and the measures of U.S.

¹² Details about the construction of the PUFC matrix are available upon request.

and Peruvian productivity will be closer. To summarize: if the more productive country has expanded proportionally more than the less productive, the second, more accurate, measure of country productivity differences will be larger. If the more productive economy has expanded less, then the second measure will be smaller.

Estimation of Country-Specific Effects

Optimally, joint estimates of time, exogenous country productivity differences and reallocation costs for each factor would be obtained using equation 23:

$$a_{Lt}^c = L_{ct} \frac{\lambda_{ct}^\alpha \kappa_{ct}^{1-\alpha}}{A_{0t} (\phi_L^c)^\alpha (\phi_K^c)^{1-\alpha} L_{ct}^\alpha K_{ct}^{1-\alpha}} \quad (23a)$$

$$a_{Kt}^c = K_{ct} \frac{\lambda_{ct}^\alpha \kappa_{ct}^{1-\alpha}}{A_{0t} (\phi_L^c)^\alpha (\phi_K^c)^{1-\alpha} L_{ct}^\alpha K_{ct}^{1-\alpha}} \quad (23b)$$

$$\text{where } \lambda_{ct} = L_{ct} \left/ \left(L_{ct-\tau-1} + \sum_{s=0}^{\tau} \eta_{Ls} l_{cs} \right) \right.$$

$$\text{and } \kappa_{ct} = K_{ct} \left/ \left(K_{ct-\tau-1} + \sum_{s=0}^{\tau} \eta_{Ks} k_{cs} \right) \right. .$$

The observed variables are the PUFC, factor-use and factor reallocation for each industry. The parameters estimated would be the industry technology parameters, α and A_{0t} ; the country-specific productivity parameters, $\phi_j^c, j=L, K$; and the factor reallocation cost parameters, $\eta_j, j=L, K$, in addition to the time trend. However, due to the relatively small number of observations, it is not possible to jointly estimate the ϕ_j^c or $\eta_j, j=L, K$ and $s=0 \dots \tau$, as expressed in equation 23. Instead, I use the estimates of η_{j0} and η_{jt} from Gramm (2005)¹³ in order to remove factor reallocation effects from the productivity measure for each country. Once the factor specificity effects are removed, the country-specific differences, ϕ_j^{Peru} and $\phi_j^{US}, j=L, K$, and the time trend are estimated.

13 Gramm (2002) derives a measure of adjustment costs due to factor specificity in a three-period model of a firm's input allocation decision. The degrees of specificity for unskilled labor and capital are then estimated based on data for 15 industries in 16 countries covering an 8 year period. Specifically, these estimates of capital and labor reallocation costs are found using a system on nonlinear first-order conditions, requiring a three-stage least squares techniques. The findings are that recently reallocated factors are indeed less productive. In the period of reallocation, manufacturing labor is approximately 15% less productive, while relative capital productivity is around 40% lower. A source of country productivity differences, therefore, lies in the fact that economies engage in various degrees of reallocation.

Note that the η_j reflect the reduced productivity of factors newly allocated to an industry. In reality, a number of manufacturing industries, especially in Peru, but also in the United States, have seen a period of contraction over the years 1980-1988. As a result, it is necessary to include estimates of relative productivity of those factors leaving a contracting industry when calculating the number of effective factor units remaining in that industry.

Empirical Implementation

A total of twelve regressions were run: six regressions with the measured PUFC as the dependent variable, and six with the reallocation-corrected EUFC as dependent (two each per factor, country, and year). The two sets are then compared to determine how removing the reallocation costs affected the estimates. Within each set of six, the first step was to remove any time trend. Dummy variables were assigned so that $d85=1$ if the year=1985 ($d85=0$ otherwise) and $d87=1$ if the year=1987 ($d87=0$ otherwise). The PUFC for labor, for capital, and for the two factor types together were then regressed on $d85$ and $d87$:

$$a_L = \beta_{0L} + \beta_{1L}d85 + \beta_{2L}d87 + \epsilon_L,$$

$$a_K = \beta_{0K} + \beta_{1K}d85 + \beta_{2K}d87 + \epsilon_K,$$

$$a_j = \beta_{0j} + \beta_{1j}d85 + \beta_{2j}d87 + \epsilon_j, j=L \text{ and } K$$

Results are reported in Table 2a.

In order to estimate the country differences in physical productivity, the residuals from each regression were then regressed on the country dummy variable, where $P=1$ for Peru and $P=0$ for the United States:

$$a_L - (\beta_{0L} + \beta_{1L}d85 + \beta_{2L}d87) = C_{0L} + C_{1L}P + \mu_L \text{ etc.}$$

Results from these regressions are reported in Table 2a. The same process was repeated for the reallocation cost-adjusted unit factor coefficient, for labor:

$$a_{Le}^c = \beta_{0Le} + \beta_{1Le}d85 + \beta_{2Le}d87 + \epsilon_{Le} a_{Le}^c - (\beta_{0Le} + \beta_{1Le}d85 + \beta_{2Le}d87) = C_{0Le} + C_{1Le}P + \mu_{Le}$$

Similar regressions were run for capital and for pooled labor and capital, the results of which may be found in Table 2b

Discussion of Results

In both sets of regressions there is evidence of a downward trend in the unit factor coefficients between the years 1982 and 1987. Although the improvement in productivity is insignificant in 1985, there is a marked and significant fall in both a_L and a_K in 1987. Note that the Peruvian productivity gains in productivity are the driving force in this change. For example, for the Peruvian unit labor coefficient alone, $\beta_0 = 0.01985$ ($t=12.26$), while $\beta_2 = -0.01453$ ($t=-6.351$). For both labor and capital the reallocation cost-adjusted unit factor coefficient falls by more than the PUFC. This result is expected since, in the case of the EUFC, the productivity loss due to reallocation has been removed in advance. When labor and capital unit factor coefficients are combined, the time trend estimates remained negative, but were not significant.

Once the factor-specificity effects are removed, the country differences are diminished in all cases. This result may be seen by comparing by how much C_1 lies above C_0 for the PUFC and the EUFC:

$$\hat{C}_{1L} = 0.0690 \text{ versus } \hat{C}_{1Le} = 0.0678$$

$$\hat{C}_{1K} = 0.4803 \text{ versus } \hat{C}_{1Ke} = 0.4673$$

$$\hat{C}_{1J} = 0.2401 \text{ versus } \hat{C}_{1Je} = 0.2336.$$

In the case of labor productivity, reallocation costs explain approximately 2% of the differences between a_L^{US} and a_L^P . In the case of capital, the costs account for around 3%. As would be expected for such disparate economies, the country differences, even after removing reallocation costs, remain large and significant. The regressions were run in reverse order (country effects first, then time trend). The results were fundamentally the same in direction of change and significance of estimates.

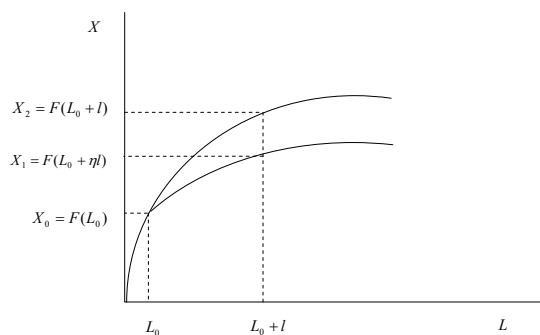
Conclusions and Future Work

The standard explanation that differences in productivity across countries are due to country-specific differences in technology is an oversimplification. As demonstrated in this paper, variation in reallocation also contributes to measured productivity differences. A significant, and often neglected, aspect of studying TFP changes involves explaining their sources, in addition to documenting their existence. Factor specificity is one piece of this larger puzzle.

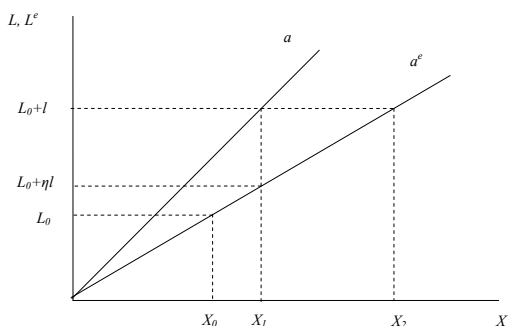
Future work in this area should include various changes to the empirical testing of the importance of reallocation. Firstly, the necessity of aggregation causes some obscuring of the true degree of factor movement within an economy. It may be presumed that much factor reallocation takes place within a broadly defined industry, not just across industries. A data set that uses input-output tables with similarly defined industries would avoid the need to aggregate to the extent that was required for this paper. Furthermore, a study comparing more institutionally similar economies, such as the U.S., Japan, and Germany, would be useful. The factor market rigidities in Peru probably contributed significantly to the degree of country-differences in productivity and diminished the role reallocation played.

FIGURE 1

Employment is initially at L_0 and all members of the workforce are fully productive. Initial output is X_0 . With the entrance of l new laborers, employment increases to $L_0 + l$. Given the lower productivity of the new laborers, output rises to X_1 only. Over time, as the laborers become fully productive, output will increase to X_2 as the lower production function shifts toward the upper curve. Consider a second country that initially produces with $L_0 + l$ fully productive laborers (because the allocation of those workers occurred in some earlier period). Due to the effects of reallocation only, the second country, producing X_2 , would have a higher measured TFP than the first country producing only X_1 .

**FIGURE 2**

This graph demonstrates how the PUFC (a) differs from the EUFC (a^e). As above, when labor is added the effective labor force rises to only $L_0 + \eta l$, while the physical labor force rises to $L_0 + l$. Therefore, a^e lies below a , as fewer effective units produce the same quantity (X_1) as the greater number of physical units. Over time, as the reallocated units become fully productive, output increases to X_2 .

**TABLE 1**
INCLUDED INDUSTRIES

Food, beverages, tobacco
Textiles, apparel, footwear
Wood products and furniture
Paper products and printing
Chemicals, except medicine
Drugs and medicine
Petroleum refineries and products
Rubber and plastic products
Pottery, china, glass and other non-metal products
Iron and steel
Non-ferrous metals
Metal products
Machinery
Electrical machinery
Transport equipment
Professional and other manufactured goods

TABLE 2A
TIME AND COUNTRY EFFECTS ON THE PUFC
(T STATISTICS IN PARENTHESIS)

	β_0	β_1	β_2	C_0	C_1
L	0.1445 (13.80)	-0.0007 (-0.046)	-0.0761 (-5.140)	-0.0345 (-4.448)	-0.0690 (6.291)
K	.7678 (16.52)	-0.0685 (-1.042)	-0.2056 (-3.129)	-0.2401 (-8.358)	0.4803 (11.82)
J	0.3839 (7.099)	-0.0343 (-0.448)	-0.1028 (-1.345)	-0.1201 (-2.840)	0.2401 (4.016)

TABLE 2B
TIME AND COUNTRY EFFECTS ON THE EUFC
(T STATISTICS IN PARENTHESIS)

	β_0	β_1	β_2	C_0	C_1
L	0.1441 (13.76)	-0.0007 (-0.050)	-0.0775 (-5.231)	-0.0339 (-4.352)	0.0678 (6.155)
K	0.7516 (16.52)	-0.0634 (-0.985)	-0.1957 (-3.042)	-0.2336 (-8.720)	0.4673 (11.70)
J	0.3758 (7.080)	-0.0317 (-0.422)	-0.0979 (-1.304)	-0.1168 (-2.813)	0.2336 (3.978)

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SOCIALLY RESPONSIBLE INVESTING FOR MUTUAL FUNDS AND OTHER FINANCIAL INTERMEDIARIES

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ABSTRACT

Socially responsible investing (SRI) has become a presence in the investment world that cannot be ignored. SRI has demonstrated its ability to earn returns equivalent to traditional investing while allowing investors to reflect their values. However, there is a risk of reduced diversification due to the limits placed on investment options. Socially responsible managers should not to allow the focus on returns to lead them away from the core values of SRI. Uniform reporting standards are being formulated and growing in usage. As more information becomes available, investors and managers will be empowered in making SRI decisions. Academicians can assist by developing a greater understanding of SRI's effect on risk and the effects of greater transparency and uniform reporting guidelines.

Introduction

Financial institutions serve as intermediaries between individual investors and corporate users of capital (Saunders & Cornett, 2006). As such, financial institutions have a fiduciary responsibility to those who place funds in their care. This is particularly true of mutual funds and other financial institutions, such as pension funds, where the investors are directly affected by the results of the intermediary's investment decisions. With this in mind, managers of mutual funds and pension funds must be mindful of the risk and return implications of their investment choices and, also, of the non-financial goals that some investors may seek to attain through their investments. This consideration of goals other than risk and return has led to the emergence of the field of socially responsible investing (SRI). The purpose of this paper is to explore SRI in terms of its history and current status, relevancy in today's investment climate, strengths, weaknesses, and current trends. The discussion will focus on information useful to managers of and investors in mutual funds and other fiduciary investment vehicles. Additionally, areas for academic exploration will be highlighted.

History and Current Status

Historical Development

The Social Investments Forum (2006), the SRI industry association in the United States, defines SRI as "an investment process that considers the social and environmental consequences of investments, both positive and negative, within the context of rigorous financial analy-

sis" (p. 2). Another definition presents SRI as the investing alternative "where you or the person who manages your money focus on companies that operate according to values akin to yours" (Kridel, 2005, p. 72). This type of investing can be traced back to the 1700s when John Wesley, the founder of Methodism, asserted that the use of money was the second most important subject of New Testament teachings. This idea was transplanted to North America by the Quakers who refused to invest in weapons and slavery (Social Investment Forum, 2006; Statman, 2005).

Investing according to one's morals was diminished by the rise of the modern public corporation in the 1920s. The separation of ownership from control of daily activities led to a focus on earnings growth at all costs (Stanley & Herb, 2007). SRI began to regain popularity in the 1960s. This time it was driven not by religion but by society's interest in civil rights, women's rights, and the anti-war and pro-environment movements (Harrington, 2003; Schepers, 2003; Statman, 2005). The movement continued to grow in the 1970s as opposition to apartheid in South Africa brought increasing numbers of investors into the SRI fold (Statman, 2005). In 1971, the first mutual fund in the United States to use broad-based social and financial criteria for screening purposes was formed with the launch of the Pax World Balance Fund (Webb, 2004).

Over the years, the issues addressed by SRI have expanded from the original issues of apartheid, weapons, the environment, and "sin" issues, such as gambling, alcohol, and tobacco, to encompass issues arising in the current culture such as alternative energy, women's issues, minority rights, labor relations, nuclear power, occupa-

tional safety, and community growth (Conover, 1991). A recent example of SRI's influence is found in Sudan. There was concern that foreign companies doing business in this country were directly or indirectly benefiting the genocidal regime. Investors began to call upon Talisman Energy, Canada's largest independent oil company to suspend operations in Sudan. At first, the company resisted this pressure, but, as investors began to sell their shares in protest resulting in a drop in stock price, the company relented (Kridel, 2005). Another example of social activism through investing can be seen in the tobacco industry. Attitudes toward smoking began to change in the 1950s when scientific evidence about the health risk of first and second-hand smoke began to accumulate. Opposition to tobacco products built until in 1996 the American Medical Association (AMA) called on the mutual fund industry to give up tobacco investments. The AMA put pressure on the funds by praising funds that signed a no-tobacco pledge and publishing a list of those that did not participate (Statman, 2005). Following the recent corporate scandals, there has been a rise in interest in corporate governance as a socially responsible (SR) screen.

SRI Today

Because SRI is as varied as the individual investors, there is no general agreement on the role of social responsibility criteria in investment management. However, Lowry (as cited in Hamilton, Jo, and Statman, 1993) identified four goals for SRI. They are 1) to encourage the hiring, retention, and promotion of women and minorities and the increase of worker ownership in corporate America, 2) to humanize the work environment, 3) to redefine how profit is used and distributed, and 4) to convince the business world that a corporate conscience can pay. There are four strategies the socially responsible investor can use to achieve these and other more individualized goals. They are 1) screening for positive and negative issues, 2) shareholder advocacy, 3) community investing, and 4) social venture capital (Harrington, 2003). While an individual investor may employ any of these four strategies, mutual funds are more likely to participate in the first two.

The Social Investment Forum (2006) lists the following 13 types of screens for company exclusion: alcohol, tobacco, gambling, defense/weapons, animal testing, product/service quality, environment, human rights, labor relations, employment equality, community investment, pornography, and faith-based. Although these are the most common screens, certain mutual funds use other screening criteria. The Aquinas SRI mutual funds invest only in companies that are consistent with

Catholic religious values, MMA Praxis mutual funds specifically serve the Mennonite Church, Amana funds follow Islamic principles, Ave Maria Catholic Values fund avoids stocks of companies involved in abortion or pornography, and the Sierra Club mutual funds only invest in companies with satisfactory environmental track records (Stanley & Herb; Statman, 2005). The Social Investment Forum (2006) identified some of the most commonly used screens. Those used in 50 percent or more of screened portfolios were tobacco, gambling, and alcohol. As of 2005, 201 mutual funds, with \$179 billion in assets, incorporate some form of social screening into their investment process. When compared with \$12 billion in assets in 1995, this represents a 15-fold increase (Social Investment Forum).

Relevancy

The relevancy of SRI to today's investment world in general and to the mutual fund manager in particular derives from the demand for SR investment options. Boutin-Dufresne and Savaria (2004) report that in 2003 the value of all socially screened portfolios exceeded \$2 trillion, representing a growth of 240 percent since 1995. This is 40 percent faster than all professionally managed assets. The Social Investment Forum (2006) reports that the 2.29 trillion in total assets being managed under SRI in 2005, represent 9.4 percent of the \$24.4 trillion in total assets under professional management. "Where Faith and Wall Street Intersect" (as cited in Kurtz, 2005) reports that 79 percent of American investors consider themselves religious or spiritual, and that 62 percent report making financial decisions that reflect their values. In Canada, 72 percent of respondents to a survey said that corporations should pursue social responsibilities in addition to making profits. When only shareholders were included, this number rose to 74 percent (Boutin-Dufresne and Savaria). With numbers like these, it behooves investment managers to become informed about SRI and consider its possible impact on their investment decisions.

In addition to mutual funds, pension funds have recently become more involved in SRI. According to Boutin-Dufresne and Savaria (2004), the California Public Employees' Retirement System, the New York City Pension Funds, and a few other important U. S. pension funds have incorporated SRI principles into their portfolio selection policies. Critics of SRI assert that pension fund managers are violating their fiduciary duties by considering criteria other than the maximizing of return. However, those pension funds that have chosen SRI counter that social responsibility is an integral part of their fiduciary responsibility that had previously been

neglected. In the wake of recent corporate scandals, investment screens that focus on corporate governance and sustainability may bring long-term benefits to pension fund beneficiaries (Sethi, 2005).

In the past when an investment's performance would begin to lag, pension funds, like other investors would simply divest from these companies rather than attempting to intervene in corporate management. More recently, however, pension funds have acquired such large equity positions in individual corporations that the decision to divest their holdings could cause turmoil in the market and lead to a fall in the price of the stock. Obviously, this is not in the best interest of the pensioners. To prevent this scenario, more pension funds are choosing to screen corporations before investing and to become active in corporate governance after investing (Sethi, 2005).

As SRI has become more prominent, several indices have been constructed to assist with measuring its success. They include the Domini Social Investments 400 Index, the Calvert Index, and the Citizens Index. These indices are all compiled by applying various screens (Statman, 2005). An investor wishing to evaluate a fund's performance by comparison to an index could choose the most appropriate one based on the screens used. Another option, the Dow Jones Sustainability Index, is compiled using best-in-class selection rules. It does not exclude companies in industries such as tobacco, gambling, and alcohol, but rather includes the best companies in each industry (Statman, 2005). The emergence of an array of indices to be used in making evaluations and comparisons is evidence of SRI's relevance to investing.

Strengths

The most obvious advantage of SRI is the satisfaction investors derive from knowing their funds are invested in firms that are compatible with their values. However, there are other advantages to SRI as well. Although some critics have hypothesized that SRI would cost investors in terms of return, Kurtz (2005) reports that analysts have studied the performance of SR indexes and mutual funds using many different methods and data sets, and no long term study has demonstrated a cost to social investing when returns are considered on a risk adjusted basis. Statman (2000) studied the results of SRI in the 1990s. He found that the Domini Social Index (DSI), a socially responsible version of the S&P 500 performed as well as the S&P 500. In fact, the raw returns of the DSI were slightly higher than those of the S&P 500. When adjusted for risk, the DSI returns were slightly lower than the S&P 500, but the difference was not statistically significant. Saucer (as cited in Bello, 2005)

compared the DSI with the S&P 500 and the Center for Research in Security Prices (CRSP) value weighted index over the period of 1986 to 1994. He found that the imposition of socially responsible screens did not alter investment performance. He also found that there was not an increase in the variability of monthly returns.

Since most investor's do not own a portfolio that is an exact replica of an index, it is necessary to also consider the results of actively managed funds. The conclusions for SR mutual funds are comparable to those at the index level. In Statman's (2000) study, the socially responsible mutual funds performed better than conventional funds of equal asset size. However, the difference was not statistically significant. A study by Bauer, Koedijk, and Otten (as cited in Kurtz, 2005) analyzed 103 screened funds in the U.S. and Europe. Using a multifactor attribution model, they found little difference in risk-adjusted performance when compared with non-screened funds in the 1990s. The same conclusion was drawn by Goldreyer, Ahmed, and Diltz (as cited in Bello, 2005) in their study comparing 49 SR mutual funds with a random sample of conventional funds during 1981 to 1997. A more recent study by Bello analyzed fund performance during the period of 1994 to 2001 and again found that socially responsible mutual funds did not differ significantly from conventional funds in terms of investment performance. In fact, this study went on to report that the two types of funds did not differ significantly in terms of assets held or degree of portfolio diversification. Studies of screened mutual funds in the United Kingdom, Germany (Bauer et al. as cited in Bauer, Derwall, & Otten, 2007), and Canada (Bauer et al.) have also found no significant difference when compared, using multi-factor analysis, with conventional funds. This apparent ability of SR funds to perform as well as conventional funds is a strength because it offers investors the satisfaction of value alignment without a corresponding sacrifice in return.

Other advantages of SRI include greater investor loyalty and lower firm specific risk. Webb (2004) points out that management misconduct has led to decreases in overall stock market investment in recent years due to lack of investor confidence. However, investments in socially responsible firms and mutual funds have increased. Harrington (2003) states that during the first nine months of 2002, a difficult time for investing, investors put 94 percent less money into mutual funds, but socially screened funds dropped by only 54 percent. In addition to investor loyalty, SRI offers the opportunity to decrease firm specific risk (Boutin-Dufresne & Savaria, 2004). Since much of the risk faced by firms results from the possibility of management misconduct

and the threat of lawsuits over issues such as employee and environmental policies, firms that implement socially responsible policies and codes of conduct while exercising strong corporate governance can reduce their overall business risk. Combining socially responsible stocks into portfolios can reduce the diversifiable risk component.

Weaknesses

The most significant weakness of SRI is the limits it places on portfolio diversification. According to Modern Portfolio Theory (MPT), an optimal portfolio is formed by diversifying investments to reduce non-systematic risk. When the available investment choices are limited by the application of non-financial criteria, an investor may not be able to achieve adequate diversification, leaving his or her portfolio with non-systematic risk that is not rewarded by the market. This would then lead to inferior risk adjusted returns (Stanley & Herb, 2007). This suggestion is contrary to the numerous studies previously mentioned that reported substantially equivalent returns even when adjusted for risk. Stakeholder Theory can be used to explain this apparent contradiction.

Rather than assuming that all stocks are homogenous as MPT does, Stakeholder Theory proposes that a firms' management of internal and external relationships will have significant effects on future profitability. For SRI this means that although the investment pool is limited by screening, the remaining pool consists of superior investments. Therefore, as investors select companies from a smaller pool of possibilities, the higher quality of the firms in the smaller pool cancels out any negative effects prescribed by MPT (Stanley & Herb, 2007). This is one possible explanation of why SR indices and funds have performed as well as their conventional counterparts. Although this explanation decreases the concern over limited diversification, a complete understanding of SRI implications has not yet been developed and fund managers should be aware of this possible weakness. Researchers can contribute to a growing understanding of SRI by studying SRI results from the perspective of Stakeholder Theory and other theories that may alleviate or confirm the lingering doubts about SRI performance.

Furthermore, an investor wishing to employ SRI in his or her entire portfolio may have difficulty doing so. As Rocco (2006) points out, the SRI universe is heavily skewed to funds that are intended to be core holdings. Of the 60 funds that Rocco identifies as strict secular screened funds, 36 are domestic large-cap or alloca-

tion funds. Only 15 are mid-cap, small-cap, or overseas mutual funds, and Rocco considers most of these to be unattractive for various reasons. Therefore, while there are good options for an attractive SR core holding, the smaller holdings needed to complete an all SR portfolio may be difficult to find.

In addition to the weaknesses related to investment diversification and portfolio building, there is a weakness related to the very purpose of SRI itself. Because socially responsible mutual funds need to attract many investors to thrive, they tend to lack specificity in screening. As Harrington (2003) points out, tobacco, environmental issues, human rights, employment equality, gambling, alcohol, and weapons are commonly used screens. These screens, however, may not address the diverse values of all investors. Of course, investors have the option of choosing individual stocks instead of mutual funds, but to do this they must give up the diversification and other advantages that come with mutual fund ownership.

Statman (2005) broadly categorized mutual funds as either strict or lenient. Strict funds tend to attract a few very loyal investors. These funds, however, are not able to attract the number of investors needed to thrive. Firms that are more lenient may not follow strict social purity and sometimes compromise by investing in firms that have weaknesses but are performing better in areas of social responsibility than peers in their industry. This compromise minimizes the limitation of diversification seen in more strict funds. In an investment environment where investors are favorable to SRI as long as the returns are acceptable but 80 percent of investors say they would not consider investing in socially responsible mutual funds unless their returns were at least equal to those of conventional funds (Krumsiek as cited in Statman, 2005), these compromises may be necessary. However, fund managers must be careful not to forget the original purpose of SRI and the promises made to investors. Bauer et al. (2007) report that ethical fund returns correlate more closely with conventional market indices than with ethical indices. This causes concern over whether fund managers are actually providing the socially responsible products promised to investors.

Current Trends

The two most pronounced trends in SRI are interest in corporate governance and a movement toward uniform reporting guidelines. In addition to screening their investments, socially responsible funds are using the strategy of shareholder advocacy to improve the firms they choose as investments. While both conventional and socially responsible fund managers, agree that support-

ing corporate reforms is important in bringing about good corporate governance, a recent study of mutual fund voting records by The Corporate Library (as cited in Glover, 2006), an independent investment ratings company, found that SR funds are more likely to vote their proxies on these issues. A report from the Social Investment Forum (2005) found that SR funds supported twice as many shareholder-proposed corporate governance resolutions, tended to support more controversial governance resolutions, and supported 69.5 percent more social/environmental shareholder resolutions than their conventional counterparts. Possibly due to the increased shareholder advocacy of SR funds, firms classified as SR have been shown to have more effective boards than their non-SR counterparts (Webb, 2004). SR boards have a higher percentage of outside directors and are more diverse. They have more directors and fewer insiders than non-SR boards.

Social reporting in the U.S. is predominantly voluntary (Rockness and Williams, as cited in Stone, 2001). However, as interest in SRI has grown, so has recognition of the need for generally accepted social reporting standards (Stone). By mid-2006, 34 companies listed on the S&P 100 based their corporate social responsibility reports on the Global Reporting Initiative's Sustainability Reporting Guidelines, a recognized third-party standard (Herro & Tazzara, 2006). This movement toward standard reporting should improve comparability among firms on SR issues. Overall, information about SR issues is becoming more readily available; 79 of the S&P 100 firms had corporate social responsibility websites in 2006, a 34 percent increase over the previous year (Herro & Tazzara). In addition, the United Nations introduced its Principles for Responsible Investment, a series of guidelines on how to integrate environmental, social, and corporate governance issues into the finance industry in April 2006 (Herro & Tazzara). SRI's influence is growing, and reporting mechanisms will be developed to keep pace with this growth. As uniformity in reporting increases, there will be a need to explore the effect of increased transparency on SRI decisions and on the performance of SRI.

Conclusion

With 9.4 percent of total global assets managed under SR funds in 2005 (Social Investment Forum, 2006), SRI is a part of the investment arena that cannot be ignored. Since growing in popularity in the 1960s and 1970s, SRI has proven its ability to earn returns equivalent to traditional investing while allowing investors to invest in their values. However, there is a risk of reduced diversification of which investors and managers must be

aware. In addition, SR managers should be mindful not to allow the focus on returns to lead them away from the core values that originally brought investors to their funds. Currently, uniform reporting standards are being formulated and growing in usage. As more SR information becomes available, investors and managers will be empowered to make better SRI decisions. Academicians can help bring about this empowerment by continuing to study the effects of SRI on return and risk and by studying the emerging area of standardized SR reporting.

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