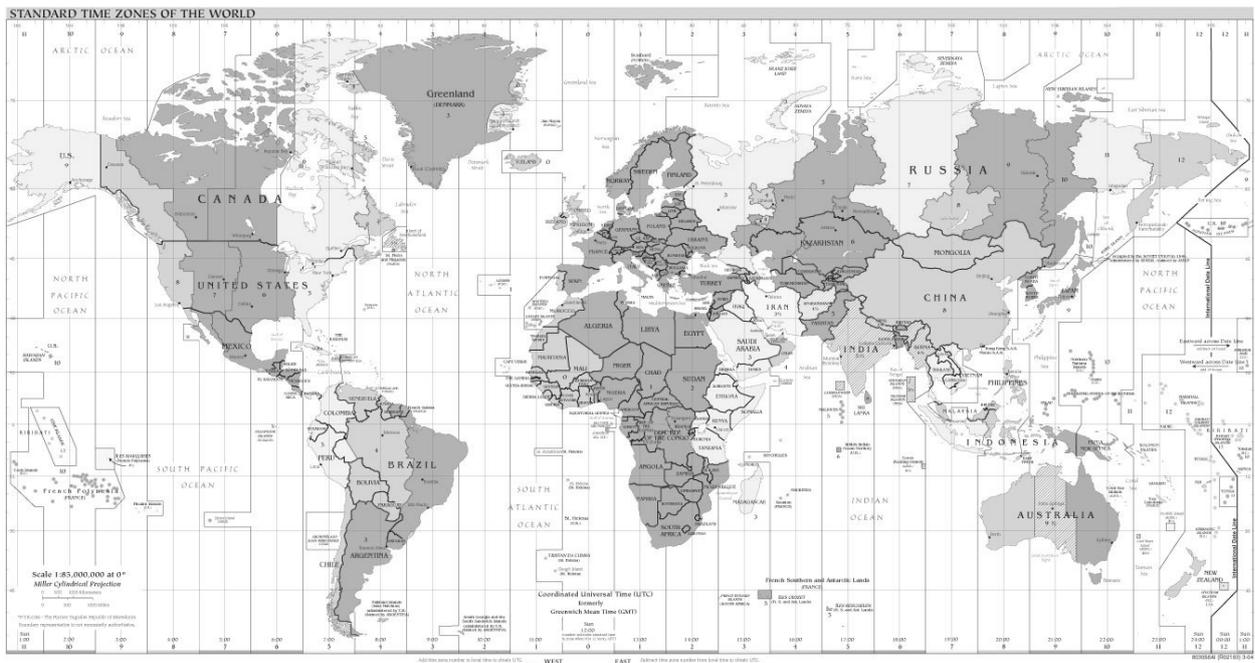


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Warmest regards,

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# GENDER DIFFERENCES IN FINANCIAL DECISION-MAKING: THE MODERATING ROLE OF LEADER/FOLLOWER STEREOTYPE THREAT

Austin Lee Nichols, Peking University HSBC Business School

## ABSTRACT

*Although stereotype threat research has extensively examined the effect of racial and gender stereotypes on various performance-related outcomes (including decision-making), the effect of leader/follower stereotypes remains unclear. Women are generally more risk-averse than men across a variety of decisions, and gender stereotype threat amplifies these differences. Despite the important and complicated gender gap in most decision-making positions, researchers have not yet examined the effect of group role stereotype threat. Participants in the current experiment either named a past subordinate (i.e., leader stereotype threat) or a past superior (i.e., follower stereotype threat) then completed various decision-making tasks. Group role stereotype threat moderated the effect of gender on decision-making. Specifically, women were more risk-averse, more loss-averse, and less accurate than were men only in the follower stereotype threat condition. These findings highlight the power of group role stereotypes in decision-making, and highlight the need for more research examining leader/follower stereotype threat.*

**Keywords:** Leadership, Decision-making, Gender, Risk-taking

## 1. INTRODUCTION

What if simply categorizing oneself as a leader or follower affected the decisions people made? Past research has discovered consistent and powerful gender differences in decision-making (Jianakoplos & Bernasek, 1998; Powell & Ansic, 1997). In general, and across most decision-making situations, women are more risk-averse than men (Byrnes, Miller, & Schafer, 1999). In addition, women are more loss-averse and risk-averse than men when making financial decisions following a gender stereotype threat manipulation (Carr & Steele, 2010). However, despite the extensive literature on stereotype threat (Blascovich, Spencer, Quinn, & Steele, 2001; Steele, 1997; Steele & Aronson, 1995; Stangor, Carr, & Kiang, 1998), the affect of leader and follower stereotypes on decision-making remains largely unknown.

Leaders often make financial decisions that affect the payoffs of all group members. In addition, leaders make many economic decisions—including those relevant to the recent global financial crisis—in group contexts, where the decision of an individual determines the payoffs of everyone in the group. These decisions often involve a high degree of risk, with gains and losses possible for everyone including the decision-maker. Across most industries, however, men occupy more decision-making positions than women occupy, and are more likely to be corporate executives (Catalyst, 2012; Eagly & Sczesny, 2009). Likewise, people perceive top management positions and executive-level jobs as requiring an achievement-oriented aggressiveness and an emotional toughness that is antithetical to the female gender stereotype (Heilman, 2001).

Role congruity theory suggests that people generally associate communal characteristics with women, characteristics that are incompatible with the role of a leader (Eagly & Karau, 2002). Consequently, problems arise for female leaders because expectations for how women should behave are often inconsistent with people's expectations of leaders (Eagly & Karau, 2002). In addition, people describe successful leaders mostly by masculine attributes (Schein, 1973).

Overall, people perceive men as having higher status than women and leaders as having higher status than followers have; these status differences often lead to increased influence and prestige among group members (Berger, Cohen, & Zelditch, 1972). In addition, women are more risk- and loss-averse than are men in their financial decision-making, including allocating less wealth to risky assets (Jianakoplos & Bernasek, 1998; Powell & Ansic, 1997). Consequently, role and gender

stereotypes may combine to predict how risk-averse or loss-averse individuals are in their decision-making. Specifically, the propensity of men to make riskier decisions than women may depend on their role (or the stereotypes of their role) in a group. In all, I expected that group role stereotype threat would moderate the effect of gender on decision-making. Specifically, the magnitude of gender differences should be stronger when under a follower stereotype threat than following a leader stereotype threat.

## 2. METHOD

Participants were 53 University of Florida students (57% women) who believed that the study would measure “individualized team decision-making”—when all group members make separate decisions that others then compile without discussion. Depending on the condition, participants reported a past subordinate (i.e., leader role prime) or superior (i.e., follower role prime) at the beginning of the study. Participants then completed decision-making tasks designed to measure loss-aversion, risk-aversion, and accuracy. Finally, participants completed demographic questions and were debriefed.

### 2.1 Measures

**2.1.1 Loss-aversion.** Participants had the option to participate in a series of six coin-toss lotteries (Carr & Steele, 2010; Tom, Fox, Trepel, & Poldrack, 2007). All ten lotteries offered a 50% chance of winning \$6 or a 50% chance of losing an amount of money that varied between \$1 and \$6. The resulting loss-aversion measure reflects the total number of lotteries each participant rejected.

**2.1.2 Risk-aversion.** Across six lotteries, participants chose between a high likelihood of winning a small prize (high expected value) and a low likelihood of winning a large prize (low expected value; Carr & Steele, 2010; Inzlicht & Kang, 2010; Thaler & Johnson, 1990). For example, one lottery presented a 70% chance of winning a \$20 prize or a 4% chance of winning a \$250 prize. The resulting risk-aversion measure reflects the number of low likelihood choices participants made.

**2.1.3 Accuracy.** Participants chose the best answer to a series of nine factual questions (Windschitl, Smith, Rose & Krizan, 2010). The resulting accuracy measure reflects the number of questions they answered correctly.

## 3. RESULTS

A participant gender (0 = men, 1 = women)  $\times$  stereotype threat condition (0 = follower, 1 = leader) interaction emerged for all three decision-making outcomes (Loss Aversion:  $B = -1.898$ ,  $t_{31} = -2.22$ ,  $p = .03$ ; Risk Aversion:  $B = -1.117$ ,  $t_{31} = -1.73$ ,  $p = .09$ ; Accuracy:  $B = 1.642$ ,  $t_{31} = 1.84$ ,  $p = .07$ ). Simple slopes tests revealed the expected moderated relationships—gender differences only resulted under the follower stereotype threat condition. Men were less loss-averse, less risk-averse, and more accurate than women were only after naming a past superior (i.e., the follower stereotype threat condition). These differences were nonexistent after participants named a past subordinate (i.e., the leader stereotype threat condition; see table 1).

## 4. DISCUSSION

When presented with the stereotype of a follower, women were more loss- and risk-averse, and answered less factual questions correctly than their male counterparts answered; no differences emerged under the leader stereotype threat condition. These findings highlight how sensitive people are to group role stereotypes, and suggest important implications for financial decision-making. In a world where gender inequalities in leadership are still very much alive (Eagly & Sczesny, 2009), it is important to consider what objective factors may contribute to the disproportionately large number of men in leadership roles. For example, the current data suggest that, when in the mindset of a follower, women may default to a more conservative style of financial decision-making. If people chose leaders somewhat based on their willingness to take risks, this can be greatly detrimental to

women's chances of narrowing this gender leadership gap. Due to the incongruence between women and leadership stereotypes (Eagly & Karau, 2002), it is important for future research to examine the mechanisms underlying these effects, and to continue examining leader/follower stereotype threat and relationship to established gender differences.

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**TABLE 1. SIMPLE SLOPES TESTS**

	<i>t</i>	<i>df</i>	<i>p</i>	<i>d</i>	Men		Women	
					<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Loss Aversion								
Follower	2.86	48	< .01	1.08	2.20	1.61	3.67	1.03
Leader	-0.63	48	.53	.25	2.25	1.67	1.82	1.72
Risk Aversion								
Follower	2.61	49	.01	.83	2.73	1.44	3.74	0.93
Leader	-0.22	49	.83	.11	3.75	0.89	3.64	1.03
Accuracy								
Follower	-1.82	47	.07	.68	5.47	1.46	4.50	1.38
Leader	0.94	47	.35	.40	4.63	1.30	5.30	1.95

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## MISCONCEPTIONS OF SALES PROMOTIONS

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### ABSTRACT

*Nowadays substantial shares of marketing budgets are rather spent on short-term sales promotions than on long-term advertising measures. For both manufacturers and retailers price promotions have gained huge importance in the competitive battle in the past decades. The opinion is widespread that price promotions if not increase profitability short-term then at least generate long-term benefits. But is this statement tenable? Investigating sales promotions based on the behavioral economic Prospect Theory, the psychological Weber-Fechner Law of perception of changes and the reference price theory this study concludes that consumers perceive price increases back to the initial level after a sales promotion period as higher as price decreases at the beginning of the according period. Furthermore the extensive use of price promotions over time shifts the anchor prices from the initial reference price down to the discounted price. Both conclusions suggest the need for managerial implications how to reduce the described effects and help to achieve long-term profitable growth of manufacturers and retailers in a highly competitive environment.*

**Keywords:** Consumer Behavior, Advertising & Promotion Management, Sales Promotions, Price Cuts and Adjustments

### 1. INTRODUCTION

During the last four decades an accentuation of price battles among competitors could be determined, both for manufacturers and retailers. Sales promotions in terms of openly communicated, temporarily and usually periodically recurring price cuts have substantially gained importance as means to compete and win against competitors. Price promotion strategies as “every day low price” or alternating high-low price periods are widely considered as the most important determining factor in the marketing mix. But can alternating prices in particular really contribute to an increase in profitability?

Manufactures and retailers often argue that while price promotions actually lead to negative revenues over the period of the promotion, they create (long-term) benefits e.g. by reduced introduction prices, generating traffic and cross-selling. This paper will compare common practice and opinion as described above with a theoretical investigation of price promotions based on the behavioral economic Prospect Theory, the Weber-Fechner law, a psychological law quantifying the perception of change in a given stimulus, and elements of the theory about reference prices.

### 2. LITERATURE REVIEW AND IMPLICATIONS

Price adjustments are widely considered as the most important determining factor in the marketing mix, with a direct effect and a clear assignment regarding sales volume and revenue (Simon, Fasnacht, 2009). An increasing share of marketing budgets is spent on short-term sales promotions, while spending for long-term measures like branding advertising decreases (Ailawadi et al., 2001). Accordingly the average marketing budget share for promotion increased from 33% to 61% between 1978 and 2001. At the same time the spending for long-term advertising decreased from 40% to 24% (Lodish, Mela, 2006).

Price adjustment strategies can simplified be characterized as EDLP strategies (every day low price) or as alternating high-low price periods, so called HiLo strategies (Ailawadi et al., 2010; Bolton, Shankar, Montoya, 2010). In order to assure success of alternating prices in terms of higher profitability, two conditions must be fulfilled: First, declining prices need to have a higher elasticity as rising prices (Simon, Fasnacht, 2009). This means that the positive demand response in the face of a

price reduction (e.g. from 100.-- to 80.--) is bigger than the declining demand caused by the according price increase back on the initial price level (e.g. from 80.-- to 100.--). Secondly, the price reductions needs to induce an uplift in sales volumes in the order of magnitude suitable to compensate losses due to lower relative margins in order to ensure higher profit over the period of the promotion (Allen et al., 2009). In practice, even the target to increase sales is often not met, because the volume uplift cannot compensate the effect of lower unit selling prices (Nijs et al., 2001). However, manufactures and retailers believe that price promotions create benefits on both short and long-term time scale e.g. by reduced introduction prices, generating traffic and cross selling.

## 2.1 Theoretic background: models and implications

This paper will compare common practice and opinion as described above with a theoretical investigation of price promotions based on the Weber-Fechner law, a psychological law quantifying the perception of change in a given stimulus, the behavioral economic Prospect Theory, and elements of the theory about reference prices.

### The Weber-Fechner Law of perception psychology

The Weber-Fechner law states that the perceived intensity of sensations is proportional to the magnitude of the objective intensity of the stimulus itself (Skouras, Avlonitis, Indounas, 2005; Simon, Fasnacht, 2009). This means that the higher the intensity of the basis stimulus is, the bigger the change of stimuli needs to be in order to generate the same perceived change.

In terms of price promotions this means that the subjective perception of price changes is relative, and the magnitude of a price change is perceived lower the higher the initial price level was. Accordingly a price reduction during a sales promotion period from 150.-- to 130.-- is perceived as less attractive as a price reduction from 100.-- to 80.-- although the absolute price reduction of 20.-- is the same in both cases. Furthermore the reduction from 100.-- to 80.-- (20% price reduction) will be perceived as lower as the following price increase from 80.-- back to the initial price level of 100.-- (25% price increase). Numerous empirical studies in the area of consumer behavior confirm that humans perceive differences rather relative than absolute (Gendall et al., 2006; McKechnie et al., 2012).

### The Prospect Theory and Reference Price Perception

According to the Prospect Theory (Kahneman, Tversky, 1979) alternatives to a reference point are judged as gains or losses. Following this, a buying decision is rather influenced by a comparison of gains and losses than by rational motivated cost-benefit assessment, and price changes within the scope of sales promotions can be perceived as gains and losses. The prospect theory postulates a s-shaped value function (see Figure 1 below) that indicates diminishing marginal returns for gains and increasing marginal costs for losses (Janiszewski, Cunha, 2004; Shoemaker, 2005; De Giorgi, Hens, Meyer, 2007).

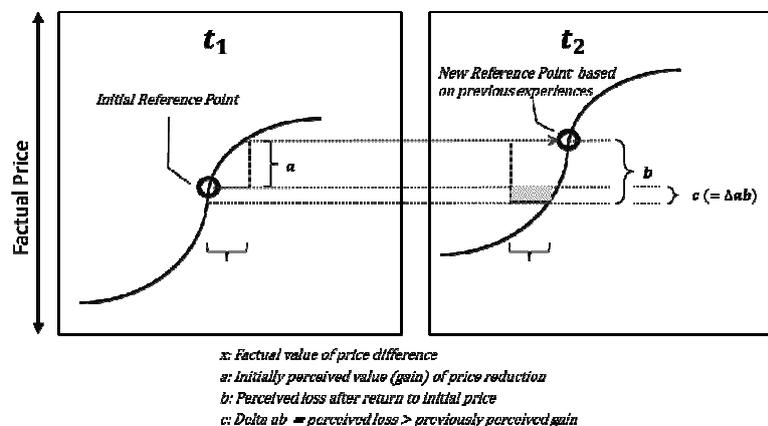


FIGURE 1: VALUE FUNCTION OF THE PROSPECT THEORY

According to the Prospect Theory a lottery winning of 2'000'000.-- is not perceived as twice as high as a winning of 1'000'000.--. Furthermore the value function is not symmetric regarding the reference point: Losses are perceived relative stronger as gains of the same amount. Transferred to situation of price promotions the prospect theory says that gains caused by price reductions during a period of price promotion are perceived as lower as the loss caused by a later move back to the initial reference price.

The obvious next question is about the reference price: In a series of alternating high-low price periods, what does the consumer really perceives as the reference price? Several studies suggest that so-called anchor prices are build on the basis of the immediate context, for example the prices of alternative products like competitive and substitute products, or the relative price placement within a product category (Simonson, Tversky, 1992; Skouras, Avlonitis, Indounas, 2005). According to the concept of adaptive expectations (Kalyanaram, Little, 1989, 1995) and the range-frequency theory (Parducci, 1965; Niedrich, Sharma, Wedell, 2001) also experiences regarding prices in the past play a role for building of anchor prices. The reference price can be described as exponentially weighted average of past observed prices (Kopalle, Rao, Assuncao, 1996), whereat anchor prices are primarily formed primarily by the last two or three purchase experiences (Hruschka, Fettes, Probst, 2001).

In terms of price promotions this means that extensive use of alternating high-low price periods leads to a shift of the reference price or anchor price from the initial undiscounted price to the level of the discounted price.

### **3. GENERAL DISCUSSION**

#### **3.1 Sales promotions, the Prospect Theory and the Weber-Fechner Law**

One condition described above for successful alternation of prices with the goal to achieve higher profitability was that declining prices have a higher elasticity as rising prices. Price reductions during a period of price promotion can be considered as gains while customers will perceive a later move back to the initial reference price as a loss. This means that alternating prices during periods of price promotions could only be justified if gains would be judged higher as losses. This contradicts the empirically well-proven Prospect Theory that says that losses are judged higher than gains due to the asymmetrical value function of the theory (see figure above).

As outlined above customers perceive prices rather relative than absolute which is according to the Weber-Fechner law. The gain of a price reduction at the start of a price promotion phase will therefore be perceived as lower as the later loss when returning from the promotion price back to the initial (normal) price level. This means that although customers tend to buy more during phases of price promotions, they will reduce the buying volume disproportional after the promotion phase (without considering an additional stock piling effect). Accordingly, also the Weber-Fechner law together with the empirically found connections in consumer buying practice contradicts a positive long-term effect of alternating price promotions.

Summarizing the described findings the authors of this paper come to the conclusion that sales promotions in terms of alternating prices contradict the basic knowledge of the Prospect Theory and the Weber-Fechner Law.

#### **3.2 Influence of sales promotions on the price anchor**

As outlined above, consumers judge prices on the basis reference or anchor prices. Those are based on the past experiences with the product, competitor or substitute products. This underlines a considerable danger caused by frequently applied price promotions: The anchor price can shift from the initial undiscounted price to the level of the discounted price. The more extensive price promotions are used for products, the higher is the probability that consumers use the discounted price as price

anchor for their gain-loss evaluation. The product is perceived in the consumer's loss area permanently whenever it is not offered at a discounted price.

Discounts educate customers to be more price sensitive. Once the price anchor shifted, the customer only perceives a real gain if even higher discounts are granted. Companies that extensively use price promotions will over the long run more and more caught in the dilemma of "what goes down – does not come up again".

As a conclusion of the above described considerations we clearly see that the also the model of reference price perceptions suggest a careful handling of price promotions. The authors work in near future will therefore focus on the managerial implications of the findings of this paper. The next section of this paper will give a short outlook on this.

#### **4. OUTLOOK: MANAGERIAL IMPLICATIONS**

Focus of the authors' work in the near future will be to derive appropriate managerial advice to control, avoid or at least compensate the above-described negative implications of price promotions. Recommendations will be put forward that consider both primary and secondary effects of price promotions.

Primary promotion effects are effects that increase demand of an entire category during a promotion phase. There is no cannibalization between products and brands; moreover the sales promotion leads to stockpiling or to a genuine higher level of consumption. On the other side secondary effects of promotion cause an increase in demand by brand switching; the promoted product cannibalizes competitor products out of the same category.

Depending on the product category, primary and secondary effects can broadly vary and lead to considerable differences regarding the managerial implications. Against the background described above, managerial advice regarding the following aspects will be developed:

##### ***Long-term pricing strategies***

How can companies use pricing rather strategically than tactically? A recommendation in this area needs to consider the entire price structure of a company, pricing processes and the "learning consumer". Whenever implementing a price promotion, questions like "Do discounts lead to a genuine more consumption or at least stock piling, or rather to cannibalization?", "How can consumers be led regarding learning and buying-behavior?", "Does a discount damage the brand image?" and "Do we fall into the competitive trap with the price promotion?".

##### ***Employee goals and incentives***

Employees try to achieve the goals that have been set. In practice these goals can be conflicting between the employees, sometimes the fundamental objectives are difficult to measure and given up and replaced by downstream objectives that allow at least fulfilling key performance indicators that are easier to measure. How can goals be defined that reflect the real and sustainable effect of sales promotions to a company?

##### ***Pricing as an integrated element of the marketing mix***

As part of the marketing mix pricing is an important element to differentiate from competitors. Via price discrimination different willingness's to pay can be skimmed. But how can companies avoid that price is the only differentiator from the consumer's point of view? How can more sophisticated price discrimination methods be used that help to selective approach customers with different willingness's to pay?

### ***Consideration of newest insights from consumer behavior and pricing psychology research***

In recent years research in the area of consumer behavior and pricing psychology revealed a number of relations that can be relevant to address the implications of sales promotions described in this paper. How can “Framing” (Arora, 2008; Gamliel, Herstein, 2011), Segregation (Janiszewski, Cunha, 2004; Shoemaker, 2005) and “Tradeoff Contrasts” as well as the “Compromise Effect” (Jäger, Engelke, Wübker, 2009) be used to achieve long-term profitable growth of manufacturers and retailers in a highly competitive environment?

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## **DETERMINANTS OF SUCCESS IN AN ONLINE MANAGEMENT INFORMATION SYSTEMS COURSE: THE SIGNIFICANCE OF GRADE POINT AVERAGE AS A PERFORMANCE PREDICTOR**

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### **ABSTRACT**

*Online courses are becoming more predominant in higher education, and there are increasing concerns by some that student learning will decline as a result of this change. One aspect of this trend has been studies that compare one mode of instruction such as a face-to-face class to another mode of presentation such as an online class or a mixed mode (hybrid) class. Often the results have been mixed, and that has led to a concern regarding the possibility that intervening factors might cloud those results. This study sought to isolate and examine the influence of intervening factors on the analysis of two modes of instruction (online versus face-to-face) with two different instructors. GPA was considered as an indicator of expected performance and was indeed significant in the analysis. In this study, the mode of instruction was found to be the least significant indicator of expected performance in a class.*

**Keywords:** Online education, grade point average, mode of instruction, regression.

### **1. BACKGROUND**

Some researchers have conducted studies to evaluate the success of the different modes of instruction, and the results have varied. Cacciamani, Cesareni, Martini, Ferrini, and Fujita (2012) focused on knowledge building by examining the influence of participation, facilitator styles, and metacognitive reflection. They found that all of those elements are conducive to knowledge building in an online course. Another study focused on the end of term student evaluation of instruction (SEI) in order to examine possible differences in those results based on the modality of instruction. Their results indicated that there was no difference in the underlying factors for the three modes of instruction (Dziuban and Moskal, 2011). Hatcher, Henson, and LaRosa (2010a) examined two different approaches to teaching information systems concepts in an online environment and found very little differences in student understanding based on the approach that was utilized. In an earlier study, Smith, Ferguson, and Aldegonda (April 1, 2001) conducted interviews with faculty teaching online to determine if online teaching differed from the traditional environment in a significant manner. Their findings indicated that there were several differences, but some were better than a face-to-face setting while others aspects were not as good.

Other researchers sought to measure active learning as a construct that could serve as a predictor of "...learner-perceived course quality" so that online courses could be designed in a manner that increases quality (Taylor, J. E. and Ku, H., 2011). That study found a high degree of correlation between their eight design principles for active learning and the student's perception of course quality. They described the eight design principles as an active learning index. In addition, previous research by other authors has sought to determine if somewhat technical information can be presented online successfully. In two earlier studies (Hatcher, 2007; Hatcher, Henson, & LaRosa, 2010b) this question was examined, and the researchers found no significant differences based on the mode of instruction when addressing technical topics in an information systems concept course. In an extensive study, Zacharis (2011) found that the online classroom provided the tools needed to address different learning styles and preferences in a fully online class as well as in a hybrid environment. Chickering and Ehrmann (1996) described "... some of the most cost-effective and appropriate ways to use computers, video, and telecommunications technologies to advance the Seven Principles" of good practice in undergraduate education.

An underlying objective of such studies is a desire to measure the quality and effectiveness of online instruction when compared to traditional face-to-face classes. That has implications for all involved parties since there has been significant growth in the number of students taking at least one online course at a U.S institution of higher education as reported by Taylor and Ku (2011). They cited a growth rate of 248 percent from 2002 to 2009 in that measure. The actual numbers grew from 1,602,970 in 2002 to 5,579,022 in 2009. They also cited an average increase of 19.5% over that time frame with a growth of 21.1% in 2009 alone. Tighter academic budgets and increased demand from students seem to be significant factors in this growth pattern along with the availability of much better technological support such as learning management systems, mobile devices, and increased bandwidth.

## 2. METHODOLOGY

It would appear that a comparison of one mode of instruction to another might prove more reliable if all of the factors involved in the comparison were considered. Our research has indicated that a student's grade point average (GPA) has a moderate degree of correlation to the student's performance in a course regardless of the mode of instruction. This research also seeks to determine how other factors in conjunction with GPA influence a student's performance in a class by incorporating the mode of instruction and the assigned instructor into the analysis.

It is not the objective of this analysis to seek the best model for the prediction of student performance in a class based on various independent input variables. Instead, the objective of this study is to examine the relationships between several independent variables in terms of their effectiveness as predictor variables in relation to performance in a particular class. The overall goal is to increase our understanding of those relationships including possible interactions.

## 3. ANALYSIS

Data have been collected from spring 2010 to spring 2012 from 11 sections of a senior-level Management Information Systems course taught by two instructors. This resulted in an analysis involving about 400 cases. The sections were a mixture of fully online classes and traditional face-to-face classes. Students could self-select the mode of the class they enrolled in, but class schedules and other issues could have also influenced their choice. All sections of this class used the same textbook and efforts were made to keep the content and the projects comparable. Students in all sections were required to take the same common final exam.

Sections	Professor A	Professor B	Total
Face to Face	4	2	6
Web Based	3	2	5
Total	7	4	11

**Table 1: Distribution of Sections of the Course**

The analysis initially utilized Multiple Linear Regression in IBM SPSS Statistics 20.0 in order to summarize the data and quantify the relationships among the variables. (SPSS, Inc., 1999) The percentage of points available in the class was the dependent variable and was employed as a proxy for performance in that class. The independent variables were mode of instruction (Web or traditional), instructor, and GPA. The GPA data were derived from transcript reports at the end of the most recent semester. Mode and instructor were binary variables while GPA was continuous ranging from 0 to 4.00. The researchers used step-wise linear regression analysis to determine the significance of each variable and also to examine interactions.

The results as reported by SPSS indicated that the inclusion of all three independent variables provided the most accurate regression data with an adjusted  $R^2$  of .176; using only the GPA for the model had an adjusted  $R^2$  of .131. Other combinations of GPA with the other two variables provided

results between these two  $R^2$  values. Considering possible combinations of the independent variables without including GPA had much lower values for adjusted  $R^2$ .

Contrary to a popular assumption that there would be a significant difference in performance in a Web-based class when compared to a face-to-face class, the mode of instruction had the lowest  $R^2$  when considered as a single predictor variable (.021). It also made the least reduction in  $R^2$  when it was removed from the analysis.

#### 4. CONCLUSIONS

While earlier research indicated that there few differences when comparing Web-based classes to traditional classes, those studies only considered the primary research questions. (Hatcher, 2005/2006), (Hatcher, 2007), (Hatcher, 2008). The results obtained in this study would suggest that other factors might need to be considered in those type of studies.

These results appear to indicate that GPA alone is a moderate indicator of expected performance in the class. However adding the mode of instruction (Web-based or face-to-face) along with a variable to account for the instructor increased the goodness of fit for the model (SPSS, Inc., 1999).

The expectation is that this research might help future researchers understand the significance of the various factors involved in a student's actual performance in a class. A particular research question involves the determination of the correlation of the mode of instruction to a student's performance in a course when other intervening factors are considered. This knowledge might suggest which factors to take into account when making those comparisons.

Future research plans include the collection of more data in future classes. It would also be beneficial to add other types of courses to the analysis. As the numbers of online course offerings expand, data of that nature should be made available. Plans are also underway to add other instructors to the mix so that there is greater variability in that regard.

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## DECOMPOSING EXCHANGE RATE MOVEMENTS

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### ABSTRACT

*The paper uses a simple model of a small open economy to illustrate the impact of real and nominal shocks on the exchange rate. A bivariate Structural Vector Auto-Regression (SVAR) is then estimated using data on the pound-dollar exchange rate to decompose real and nominal exchange rate movements into real and nominal shocks. The results suggest that real shocks are the dominant source of movements in both the real and nominal exchange rates. However, the variation attributable to nominal shocks, although much less, is still significant. Interestingly, the persistence of exchange rates appears to be driven more by nominal shocks.*

**Keywords:** Structural VAR, Exchange Rates, Real Shocks, Nominal Shocks

### 1. INTRODUCTION

As stressed by MacDonald (1999), determining the relationship between macroeconomic fundamentals and exchange rates is one of the most important research questions in international finance. The current study contributes to this literature by addressing the following questions: (a) What is the relative importance of the real and nominal shocks? (b) What is the nature of the response of the real exchange rate and the nominal exchange rate to each of these shocks? Real shocks are defined as shocks relating to aggregate demand or supply, such as fiscal stimulus and productivity shocks. Nominal shocks stem from monetary sources. The questions mentioned above are important for understanding exchange rate volatility and the persistence of deviations from Purchasing Power Parity. Further, the answers to these questions have implications for fiscal and monetary policy. Despite a considerable literature, the question of which type of shock is more important in driving the real exchange rate remains controversial.

Many of the studies in this area are based on the Blanchard and Quah (1989) structural Vector Auto-Regression (VAR) method. This method, henceforth referred to as the BQ method, identifies the structural model by imposing long run restrictions on the relationship between the structural shocks and the VAR residuals. The most common long run restriction is that one or more structural shocks have at most a temporary impact on one or more of the endogenous variables. For concreteness, fix the context as the modeling of real and nominal exchange rates in a bivariate VAR framework. The standard BQ method allows the researcher to decompose the movements in the two VAR variables into two structural shocks by imposing the identifying restriction that one of the shocks has a permanent effect on the real exchange rate and the other shock, only a temporary impact. The permanent shock is typically interpreted as a real shock and the temporary shock as a nominal shock.

One of the earliest such studies is by Lastrapes (1992), who applies the BQ method to US dollar exchange rates of several advanced economies. The results indicate that real shocks account for most of the variation in both the real and nominal exchange rates regardless of the time horizon. Evans and Lothian (1993) and Enders and Lee (1997) are mostly supportive of these results. Another well-known study that investigates the US dollar real exchange rate against currencies of other advanced economies is by Clarida and Gali (1994). They use a trivariate VAR based on the real exchange rate, ratio of US to foreign GDP and the inflation differential to decompose the real exchange rate into demand, supply and nominal shock components. Their results indicate a relatively inconsequential role for supply shocks. However, interestingly, they find that nominal shocks appear to play a larger role in the case of some currencies. Eichenbaum and Evans (1995), Rogers (1999) and Kim and Roubini (2000) are some other studies that appear to confirm the importance of nominal shocks. However, a careful study by Faust and Rogers (2003) does not support monetary shocks as the primary source of exchange rate volatility.

More recent studies have also investigated the matter of which shocks are most important in driving exchange rates. Examples of studies that stress the importance of monetary shocks include Forni and Gambetti (2010) and Bouakez and Normandin (2010). However, Steinsson (2008) and Juvenal (2010) are examples of studies that argue in favor of real shocks as the primary drivers of the volatility and persistence of real exchange rates.

The current study seeks to contribute to this literature by reinvestigating the relative importance of real and nominal shocks. This preliminary version takes a first step towards that end by updating the Enders and Lee (1997) study using more recent data. As such, it applies the BQ method to estimate the relative importance of real and nominal shocks in explaining the variability of real and nominal exchange rates.

Section 2 outlines a simple macroeconomic model to illustrate the impact of the structural shocks on exchange rates. Section 3 outlines the BQ methodology and Section 4 describes the data used in the study and presents results. The last section concludes with ideas for further research.

## 2. MODEL

The model outlined below is a standard open-economy Dornbusch model (Dornbusch, 1976), and is almost identical with the one described in Enders and Lee (1997), henceforth EL. It consists of the following:

A money demand equation:

$$m_t = p_t + y_t - \lambda i_t, \quad \lambda > 0 \quad (1)$$

An equation relating the interest rate differential to the nominal exchange rate:

$$i_t - i_t^* = \gamma E_t(e_{t+1} - e_t) \quad (2)$$

An excess demand equation:

$$d_t = \tau y_t + \delta(e_t + p_t^* - p_t) + g_t - \sigma i_t - y_t, \quad 0 < \tau < 1; \quad \delta, \sigma > 0 \quad (3)$$

An inflation equation:

$$p_{t+1} - p_t = \pi d_t, \quad \pi > 0 \quad (4)$$

Above,  $m_t$  is money demand,  $p_t$  is the price level,  $y_t$  is domestic output,  $i_t$  is the nominal interest rate,  $e_t$  is the nominal exchange rate,  $d_t$  is excess demand, and  $g_t$  is government expenditure.  $E_t$  is the expectations operator conditional on information available at time  $t$ , and variables with an asterisk pertain to the foreign country. All variables other than interest rates are in logarithmic form.

The above equations are exactly the same as the ones in EL, with one exception. In EL, Uncovered Interest Parity (UIP) is invoked to equate the expected change in the nominal exchange rate to the interest rate differential. However, most empirical studies have found the UIP condition to be violated (refer to Sarno and Taylor, 2002 for an excellent review). In the current study, the UIP condition is modified by introducing the parameter,  $\gamma$ , which may be positive or negative. UIP is a special case in which the value of this parameter is unity. The introduction of this parameter allows the expected change in the exchange rate to be proportional, but not necessarily equal, to the interest rate differential. If  $\gamma < 0$ , the model would imply negative correlation between the nominal exchange rate and the interest rate differential, which is consistent with the findings of many empirical studies, and often referred to as the forward premium puzzle.

The real exchange rate is given by:

$$r_t \equiv e_t + p_t^* - p_t \quad (5)$$

For simplicity, the foreign price level and interest rate are normalized to zero, and the model is closed by assuming that domestic output, money supply and government expenditure each follow a random walk.

Using standard methods, the model can be solved for the domestic price level and the nominal exchange rate:

$$p_t = \eta_1^t p_0 + (1 - \eta_1) \sum_{k=1}^t \eta_1^{k-1} (m_{t-k} - y_{t-k}) \quad (6)$$

$$e_t = \Omega_0 p_t + (1 - \Omega_0) m_t + \Omega_2 y_t - \frac{g_t}{\delta} \quad (7)$$

Above,

$$\eta_1 = 1 + \frac{1}{\gamma \lambda \Omega_0} \quad (8)$$

$$\Omega_0 = \frac{1}{2} \left[ \left( 1 + \frac{\sigma}{\delta \lambda} \right) - \sqrt{\left( 1 + \frac{\sigma}{\delta \lambda} \right)^2 + \frac{4}{\delta \gamma \lambda \pi}} \right] < 0 \quad (9)$$

$$\Omega_2 = \frac{1 - \tau}{\delta} + \frac{\sigma}{\delta \lambda} + \frac{1}{\delta \gamma \lambda \pi \Omega_0} \quad (10)$$

Consider the immediate impact of a monetary shock on the real and nominal exchange rates:

$$\frac{de_t}{dm_t} = \frac{dr_t}{dm_t} = (1 - \Omega_0) > 1 \quad (11)$$

However,

$$\lim_{j \rightarrow \infty} \frac{de_{t+j}}{dm_t} = \Omega_0 (1 - \eta_1) \sum_{k=1}^{\infty} \eta_1^{k-1} + (1 - \Omega_0) = 1 \quad (12)$$

Thus, the long run impact on the nominal exchange rate is proportional to the monetary shock while the short run impact is greater. This demonstrates the well-known “overshooting” result.

Also, it is apparent that the long run impact of a monetary shock on the price level is identical to that on the nominal exchange rate:

$$\lim_{j \rightarrow \infty} \frac{dp_{t+j}}{dm_t} = (1 - \eta_1) \sum_{k=1}^{\infty} \eta_1^{k-1} = 1 \quad (13)$$

Therefore, monetary shocks have no impact on the real exchange rate in the long run.

The model allows for two types of real shocks – an income (or supply) shock and a fiscal (demand) shock. The long run impact of an income shock is given by:

$$\lim_{j \rightarrow \infty} \frac{de_{t+j}}{dy_t} = \frac{1-\tau}{\delta} - 1 \quad (14)$$

$$\lim_{j \rightarrow \infty} \frac{dp_{t+j}}{dy_t} = -1 \quad (15)$$

Therefore,

$$\lim_{j \rightarrow \infty} \frac{dr_{t+j}}{dy_t} = \frac{1-\tau}{\delta} \quad (16)$$

And, the long run impact of a fiscal shock is given by:

$$\lim_{j \rightarrow \infty} \frac{dp_{t+j}}{dg_t} = 0 \quad (17)$$

$$\lim_{j \rightarrow \infty} \frac{de_{t+j}}{dg_t} = \lim_{j \rightarrow \infty} \frac{dr_{t+j}}{dg_t} = \frac{-1}{\delta} \quad (18)$$

A key implication of this model is that while real shocks have a permanent impact on both the real and nominal exchange rates, monetary shocks have a permanent impact only on the nominal exchange rate. The result that monetary shocks have only a temporary impact on the real exchange rate is used as an identifying restriction in the BQ methodology, the subject of the next section.

It is worth noting that these results do not require UIP. It is sufficient that the expected exchange rate movement is linearly related, positively or negatively, to the interest rate differential.

### 3. ECONOMETRIC METHODOLOGY

Below is a description of the BQ methodology. Suppose that the joint dynamics of two economic variables are described by the following structural model in which the variables of interest are expressed as a moving average of white noise innovations (structural shocks):

$$\begin{aligned} x_t &= \mu + A_0 \varepsilon_t + A_1 \varepsilon_{t-1} + A_2 \varepsilon_{t-2} + \dots \\ &\equiv \mu + A(L) \varepsilon_t \end{aligned} \quad (19)$$

Above,  $x_t$  is a bivariate vector consisting of two variables  $x_1$  and  $x_2$ . Both are assumed to be stationary. However, at least one of the two variables should be interpreted as a first difference of a non-stationary variable. In the current study, the two variables are the real and nominal pound-dollar exchange rate, both expressed as first differences.  $\varepsilon_t$  is a bivariate vector of independent structural shocks. Each  $A_i$  is a 2 by 2 matrix. For example,

$$A_0 = \begin{bmatrix} A_0^{11} & A_0^{12} \\ A_0^{21} & A_0^{22} \end{bmatrix} \quad (20)$$

$A(L)$  is a lag polynomial.

The reduced form model is represented as a bivariate moving average of the VAR residuals:

$$\begin{aligned} x_t &= \mu + e_t + C_1 e_{t-1} + C_2 e_{t-2} + \dots \\ &\equiv \mu + C(L)e_t \end{aligned} \quad (21)$$

Above, the bivariate vector  $e_t$  represents the VAR residuals and each  $C_i$  is a 2 by 2 matrix, and  $C(L)$  is a lag polynomial.

Observe that

$$e_t = A_0 \varepsilon_t \quad (22)$$

This follows from the fact that both sides of the above equation represent one-step ahead forecast errors. Thus, the above expression gives the contemporaneous relationship between the structural shocks and reduced form residuals.

The econometric objective is to estimate the matrix,  $A_0$  in order to enable decomposition of the structural shocks into VAR residuals. The estimated  $A_0$  can then be used to simulate the response of each of the endogenous variables ( $x_1$  and  $x_2$ ) to one-time structural shocks.

In order to estimate  $A_0$ , we need relationships that express the unknown parameters in terms of the estimated coefficients and/or residuals of the reduced form VAR model. Below are derived the equations for this purpose..

Following common practice, normalize the covariance matrix of structural shocks to an identity matrix. Let  $\Sigma$  denote the covariance matrix of the VAR residuals. From (22), it is easily seen that:

$$\Sigma = A_0 A_0' \quad (23)$$

Above, the prime denotes the transpose of a vector or matrix.

From (19), (21) and (22),

$$\begin{aligned} x_t &= A_0 \varepsilon_t + C_1 A_0 \varepsilon_{t-1} + C_2 A_0 \varepsilon_{t-2} + \dots \\ &= C(L) A_0 \varepsilon_t \end{aligned} \quad (24)$$

Therefore,

$$A(L) = C(L) A_0 \quad (25)$$

This implies that

$$A(1) = C(1) A_0 \quad (26)$$

Above,  $C(1)$  is a 2 by 2 matrix that can be calculated from the estimated VAR model. It represents the value of the polynomial  $C(L)$  for  $L = 1$ , and is basically the sum of the all the lagged coefficients in  $C(L)$ .  $A(1)$  is a 2 by 2 matrix, in which the  $ij$ 'th element,  $A_{ij}$ , represents the cumulative, long run impact of the  $j$ 'th shock on the  $i$ 'th variable:

$$A(1) = \begin{bmatrix} A_{11} & A_{12} \\ A_{21} & A_{22} \end{bmatrix} \quad (27)$$

Pre-multiplying and post-multiplying both sides of (23) by  $C(1)$ , we get

$$\begin{aligned} C(1)\Sigma C(1)' &= C(1)A_0 A_0' C(1)' \\ &= A(1)A(1)' \end{aligned} \quad (28)$$

Above, the second line of the equation follows from (26).

In the standard BQ method, identification is usually accomplished by imposing the condition that one of the two structural shocks has only a temporary effect on one of the VAR variables, thus effectively restricting  $A(1)$  to be triangular. This allows  $A(1)$  to be determined as the Cholesky decomposition of the left-hand-side of (28). One may then use the following equation, which follows from (26), to determine  $A_0$ .

$$A_0 = C(1)^{-1} A(1) \quad (29)$$

#### 4. DATA AND ANALYSIS

The analysis is based on monthly data for the period December 1992 through May 2012 on the pound-dollar exchange rate from the website of the Board of Governors of the Federal Reserve System in the US, the US CPI index from the website of the Bureau of Labor Statistics in the US and the UK CPI index from the website of the Office of National Statistics in the UK.

Summary statistics are presented in Table 1.

**TABLE 1: POUND-DOLLAR EXCHANGE RATE**

	<i>Nominal Rate</i>	<i>Real Rate</i>
Mean	1.6449	1.6333
Standard Error	0.0106	0.0084
Median	1.6088	1.6326
Standard Deviation	0.1614	0.1277
Sample Variance	0.0260	0.0163
Kurtosis	-0.0227	-0.4321
Skewness	0.8817	0.0969
Range	0.6700	0.5753
Minimum	1.4077	1.3694
Maximum	2.0777	1.9447

The VAR model is estimated using first differences with the log of the real rate (LogReal) and the log of the nominal rate (LogNominal) as the two variables. The lag-length is chosen based on the Akaike Information Criterion (AIC), and Ljung-Box diagnostic tests support the white-noise nature of the residuals.

The next step is to identify the structural shocks by imposing appropriate restrictions. The standard Blanchard-Quah (BQ) approach, briefly described in the previous section, is designed to separate permanent and temporary shocks. The long-run identifying restriction that is imposed is that one of the shocks has only a temporary effect on the real exchange rate. Table 2 shows the forecast error variance decomposition results using this restriction.

**TABLE 2: VARIANCE DECOMPOSITION – BLANCHARD AND QUAH METHOD**

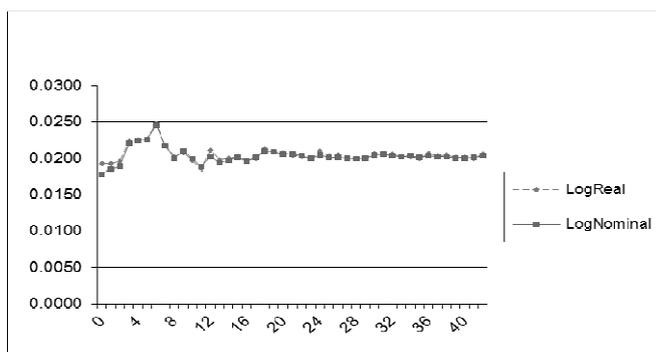
Forecasting Horizon (Months)	Per cent of Forecast Error Variance due to permanent shock		Per cent of Forecast Error Variance due to temporary shock	
	LogReal	LogNominal	LogReal	LogNominal
1	76%	62%	24%	38%
3	74%	61%	26%	39%
6	74%	61%	26%	39%
12	72%	60%	28%	40%
24	72%	59%	28%	41%
36	71%	59%	29%	41%

Note: The “permanent” (“temporary”) shock is the structural shock that has a permanent (temporary) effect on LogReal. It turns out that both shocks have a permanent impact on LogNominal.

It is seen that at both short and long run horizons, the permanent shock accounts for a much larger share of the variability of both the real and nominal rates. However, the temporary shock is still

significant, and plays a bigger role in explaining the variance of the nominal than the real rate. These findings are broadly consistent with prior studies such as Lastrapes (1992) and Enders and Lee (1997) that are based on this methodology. Consistent with these prior studies, the permanent shock may be interpreted as a real shock (such as a fiscal or productivity shock) and the temporary shock as a nominal (or monetary) shock.

**FIGURE 1: IMPACT OF A PERMANENT SHOCK**



**FIGURE 2: IMPACT OF A TEMPORARY SHOCK**

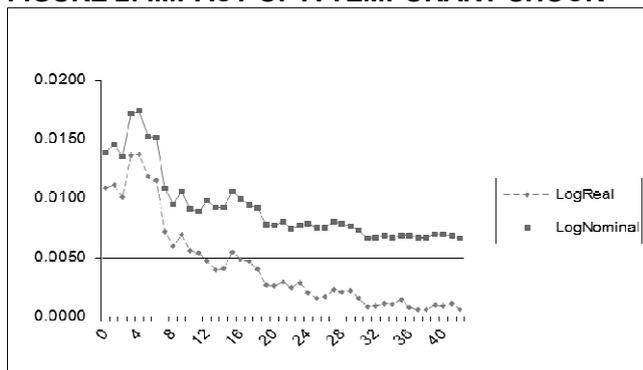


Figure 1 shows the cumulative impact of a one standard deviation permanent shock on each of the endogenous variables, namely, the real and nominal exchange rates. Adjustment to the real shock is mostly complete in about 12 months. Also, the real shock has a permanent effect on both the real and nominal exchange rates.

Figure 2 shows the cumulative impact of a one standard deviation nominal shock on each of the endogenous variables. As required by the identifying restriction, the long run impact of this shock on the real exchange rate approaches zero with the passing of time. It is interesting to note that full adjustment of the real rate is incomplete even after 42 months. Thus, the persistence of the real exchange rate appears to be related to the nominal shock. Also, there is clear evidence of overshooting by both the real and nominal exchange rates, consistent with the Dornbusch (1976) model outlined in a previous section.

## 5. CONCLUSION

The results suggest that real shocks play a relatively more important role in exchange rate volatility than nominal shocks. However, the variation attributable to nominal shocks, although much less, is still substantial. Also, there is also indication of overshooting by exchange rates. Interestingly, the persistence of exchange rates appears to be related to nominal rather than real shocks.

However, these findings cannot be taken to be conclusive. First, the BQ methodology applied to a bivariate model is capable of fully identifying only two structural shocks. In this study (as in many previous ones), the shocks have been interpreted as real and nominal shocks. However, as noted by Enders and Lee (1997) among many others, real shocks themselves may be further decomposed into demand and supply shocks. The problem, as noted in the seminal BQ study, is that, in the presence of multiple types of real shocks, the BQ decomposition would be valid only if the response of the exchange rates to these different types of shocks is sufficiently similar. Second, the identifying restrictions are based on a model that assumes monetary policy to be exogenous. The model does not take into account that many central banks, including the Bank of England, appear to follow some form of the Taylor Rule (Taylor, 1993 and Clarida, Gali and Gertler, 1998). Investigating the effects of a Taylor-rule based monetary policy on exchange rates is an important research area (Engel, 2011). Exploring the implications of such a model for the problem of identifying the underlying drivers of exchange rates is left for future research.

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## THE IMPACT OF VENTURE CAPITALISTS' VALUE-ADDED SERVICES ON PORTFOLIO COMPANIES' ENTREPRENEURIAL ORIENTATION

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### ABSTRACT

*How venture capitalists (VCs) exert influences on their portfolio companies is a focus being concerned in peer research. The strategic influence of VCs is regarded as the major influence on their portfolio companies. In order to reveal how VCs affect their portfolio companies in respect of strategic orientation, this paper aims at finding the relationship between the value-added services of VCs and their portfolio companies' entrepreneurial orientation (EO), which is vital strategic orientation for its existence and development. There are different definitions and divided dimensions of value-added services in the existing study. This paper clarifies the concept and construct of VCs' value-added services, and puts forward network resources support, follow-up financial support, strategic support, and management support as four dimensions of the value-added service from the theoretical perspective. The paper proposes that VCs' value-added services are positively associated with his portfolio companies' EO based on the resource-based theory, and then analyzes the relationship between value-added services and EO on the dimension level. The paper finds that VCs' network resources support promotes two of three EO dimensions including innovativeness and proactiveness; the follow-up financial support advances all of the three dimensions, such as innovativeness, risk taking and proactiveness; the strategic support just enhances proactiveness; the management support just promotes innovativeness. This paper shows that the way through which each value-added service impacts EO may be different on the dimension level.*

**Key words:** *value-added services; entrepreneurial orientation; innovativeness; risk taking; proactiveness*

### 1. INTRODUCTION

New ventures lack the resource capacity, market power and other advantages, which mature enterprises own. The success of new ventures largely depends on whether introducing entrepreneurial orientation strategy to enhance their proactive and innovative behavior so as to realize strategic integration and promotion, subsistence and growth of new ventures (Tang, 2008; Wang et. al., 2006). The portfolio company who gets the venture capital (VC) support are generally new venture, therefore the establishment and consolidation of entrepreneurial orientation (EO) plays a decisive role in survival and development of the portfolio company. As we know, the VC firm gets involved in portfolio companies and exerts direct influence on them through value-added services. Economic benefits are realized when venture capitalists seek involvement when their expertise and strengths can be put to maximum use in guiding strategy and decision-making processes (Jain, 2001). So we can deduce that value-added services from venture capitalists (VCs) will produce the significant influence on the portfolio company's strategic orientation namely EO.

The existing literature on the research of value-added services focuses on its content (Gorman and Sahlman, 1989; MacMillan et. al., 1989; Dotzler, 2001) and its relationship with performance (Brav and Gompers, 1997; Engel and Keilbach, 2007; Peneder, 2010). There is little research that regards EO of the portfolio company as outcome variable of value-added services. Much has been written on external influencing factors of EO such as the competitive environment, the level of technical development, the industrial environment, social culture (Miller and Friesen, 1983; Lee and Peterson, 2000; Caruana and Ewing, 2002) etc., and literature seldom aims at value-added services as influence factor. Although Bruining and Wright (2002) points out that VC firms can enhance all the dimensions of EO of portfolio company after MBO, their paper haven't clarified the influencing way from value-added services dimensions in detail. For this reason, this paper is based on resource-based theory to indicate the influencing law of VCs value-added services on EO on the dimension

level, and to find reasonable junction point between VC and strategic management study.

## 2. DEFINITION AND CONSTRUCT OF VALUE-ADDED SERVICES

Lots of previous literature has focused on the VCs involvement in portfolio companies, and different researchers have given variable descriptions of VCs' value-added service. Based on researches from Ahdekivi(1990), Fredriksen et al.(1990), and Gorman and Sahlman(1989), Sapienza(1994) summarizes that VCs involvement includes assistance to ventures on the strategic level as sounding boards and generators of strategic initiatives, on the operational level as executors of such managerial functions as recruitment and negotiation, and on the personal level as friends, mentors, and confidants of venture CEOs. And MacMillan et al. (1989) puts a more elaborate list of 20 activities.

Sum up the existing descriptive analysis of value-added services combining with the practice of Chinese VC operation, we can find that the value-added services provided by VCs mainly contain the internal help to the portfolio companies and resource introducing from outside to inside. The internal help activity is that the VCs support the portfolio companies from strategic planning and strategic execution, which mainly provides the knowledge resource and can be further defined as strategic support and management support. The external activity is to help the enterprises introducing two kinds of resource including capital resource and social network resource, which can be further defined as follow-up financial support and network resources support. Thus we can define the value-added services as resource provision by VCs in the form of consulting activities and assistance.

From the above, value-added services provided by VCs to portfolio companies should be divided into four kinds of support activities that construct four dimensions of value-added services. The four dimensions are: (1) *Network resources support*: The VCs provide their social network to portfolio companies, in order to let them obtain and make use of VCs' network resource. (2) *Follow-up financial support*: The VCs use their relationship and skills in capital market to help portfolio companies to raise necessary follow-up funding. For further explanation is to make follow-up financial plan, raise funding by all possible means, and carry on merge and listed preparation for portfolio companies. (3) *Strategic support*: The VCs use their knowledge and experience to provide a series of consulting service for portfolio companies' strategy establishment. To be specific, help enterprises setting up the board of directors, and participating in the important strategic decision. (4) *Management support*: The VCs provide the guidance and help on the portfolio companies' internal operation and management activities as a consultant (e.g. to assist enterprises to standardize the management system, optimize the operation process, and offer the necessary help for key business activities).

## 3. IMPACT OF VALUE-ADDED SERVICES ON EO

EO is a resource-consuming strategic orientation (Covin and Slevin, 1991; Romanelli, 1987). The successful implementation of an entrepreneurial orientation as a strategic orientation appears to require access to considerable resources (Covin and Slevin, 1991; Wiklund and Shepherd, 2005). From the above definitions we can know the value-added service is actually the way VCs provide network resource, financial resources, and knowledge resources to portfolio companies. The more and better quality resources obtained by portfolio companies from VCs, the more abundant the resource base of portfolio companies become, the stronger the portfolio companies' ability of risk taking, innovation and protectiveness will be. Thus the VC value-added services have the significant impact on resources consumption mode strategic orientation i.e. EO.

By far the most influencing dimension divisions of EO are "three dimensions" proposed by Miller (1983) and "five dimensions" by Lumpkin and Dess (1996). This paper adopts Miller's three dimensions division, which is used by most scholars. The three dimensions are innovativeness, proactiveness, and risk taking.

### 3.1 Impact of value-added services on innovativeness

The innovativeness of EO is the tendency of an organization to engage in and to support new ideas,

novelty, experimentation and creative processes that result in new products, services or technological processes (Miller, 1983; Lumpkin and Dess, 1996). The level of expenditures and number of resources dedicated to research and development also represent a firm's involvement in innovation activities (Lumpkin and Dess, 1996). The involvement of VCs enables the social network of portfolio companies has been expanded. Through the new network, portfolio companies can establish the extensive connection with government, universities, successful entrepreneurs, consulting companies, law firms, and investors etc. to obtain more abundant resources. Under the abundant network resources, portfolio companies can get information about industry upgrading and transferring, industrial support direction and the other policy information, which will make portfolio companies choose the direction of technological innovation early enough. Supported by the expanded network, the portfolio companies can timely grasp the dynamic development of cutting-edge technology and get the latest scientific research achievements to accumulate the technological innovation ability. At the same time, portfolio companies cooperate with other enterprises in the network will improve their technological innovation capacity. Hage (1980) argues that the more professionals and specialists in a firm, such as engineers and scientists, the higher the level of innovation. Thus the technical experts recommended by venture capitalists are able to enhance the level of enterprise technology innovation.

Financial slack can protect firms from the uncertain outcomes of innovation experimentation, thus financial capital should stimulate a firm's innovativeness (Wiklund and Shepherd, 2005). The follow-up financing support from VCs enables the enterprises increase the R&D funding, which will be used for the purchase of new testing equipment, related patents, hiring and retaining outstanding technical talents. The financial support can also help the portfolio company effectively carry out the innovation-oriented human resource practice, such as support the employees to participate in the testing innovation project, and provide technical training to the employees in many ways. That makes enterprises accelerate the pace of technological innovation, keep the continuous innovating power and get more innovation achievements.

The VCs management support can effectively improve the enterprises' support to technology innovation and stimulate the innovating enthusiasm of the employees. For example, under VCs help of optimizing enterprises' governance structure, the relationship among manager's responsibilities, rights and interests will be more clear, which will let the managers actively support the employee's innovation behavior. By helping enterprises to establish the incentive and constraint mechanisms to encourage innovation, which will make the evaluation of R&D employees' results be more scientific and reasonable. Thus R&D employees can be fully motivated and maintain continuous innovation passion. Therefore,

Proposition1: The network resource support of VCs positively promotes the innovativeness of portfolio companies.

Proposition2: The follow-up financial support of VCs positively promotes the innovativeness of portfolio companies.

Proposition3: The management support of VCs positively promotes the innovativeness of portfolio companies.

### **3. 2 Impact of value-added services on proactiveness**

Proactiveness is like what Venkatraman (1989) says. It is that proactiveness is expected to be manifested in terms of seeking new opportunities, which may or may not be related to the present line of operations, introduction of new products and brands ahead of competition, strategically eliminating operations, which are in the mature or declining stages of life cycle. Such a process requires reinvestments and should be considerably easier if the firm has access to more financial capital (Wiklund and Shepherd, 2005). According to the funding requirement for different period of technology innovation and risk preference of different financing channels, VCs will provide financing support for enterprises to promote the smooth progress of entrepreneurial activities. Financial support can avoid suspending the technology innovation without enough funding in R&D stage, which will lead the portfolio companies to get innovating results ahead of competitors and take many advantages in competition. In the achievement transformation stage, the financial support enables enterprises to

finish the test successfully and introduce the new products firstly. Especially after R&D of new technology is achieved, VCs introduce other financial channels through their contacts so that enterprises can quickly open the market in the support of sufficient follow-up capital and occupy the market ahead of competitors.

Portfolio companies get in touch with more customers, vendors and suppliers provided by entrepreneurial network from VCs to keep abreast of changes in consumer preference, predicts market trends and discover new market opportunities. The core work of VCs strategic support is to help enterprises find the external environment opportunities. In the process of strategic planning, the entrepreneurs will deeply understand the development direction of the industry, seek innovation points and catch the new market opportunities ahead of competitors under the help of VCs experience and insight. Furthermore, VCs can lead enterprises to find potential consumer demand, forecast the market changes, identify commercial opportunities for future market, and promote the enterprise to seize the opportunity to develop and introduce the new products or services. Thus,

Proposition4: The network resource support of VCs positively promotes the proactiveness of portfolio companies.

Proposition5: The follow-up financial support of VCs positively promotes the proactiveness of portfolio companies.

Proposition6: The strategic support of VCs positively promotes the proactiveness of portfolio companies.

### **3.3 Impact of value-added services on risk-taking**

The risk-taking of EO is the degree to which managers are willing to make large and risky resource commitments, and high risk-taking behaviors include borrowing heavily, investing in unexplored technologies, or bringing new products into new markets etc. (Lumpkin and Dess,1996). Greater access to financial capital can mitigate the chance of risky projects becoming fatal, stimulating risk taking (Wiklund and Shepherd, 2005). Therefore, risk taking is closely related to the enterprises' financial capability and possibility of obtaining financial support from different channels. After the first investment, VCs will actively provide different follow-up financial support for portfolio companies' start-up period, growth period and mature period, according to their prediction on enterprises' development. The abundant fund can enhance the ability of portfolio companies to solve all kinds of strategic risk at every stage of company development.

Meanwhile, financial capital is the most generic type of resource and can relatively easily be converted into other types of resources (Dollinger, 1999). The follow-up financial support provides a variety of financial channels for enterprises, so as to enhance the manager's risk propensity, which is defined by Brockhaus (1980) as "perceived probability of receiving the rewards". The strategic options open to a firm are broader, should more resources be available (Romanelli, 1987). So under the enough capital support, portfolio company managers can bravely invest in the development of unexplored technology and dare to be engaged in more radical innovation project for long-term development of the portfolio company rather than incremental innovation project. At the same time, the portfolio company managers can put the new product into new markets, spend a huge amount of money to develop new markets, and invest a lot of money in the market research, advertising, product trial sale etc. Therefore,

Proposition7: The follow-up financial support of VCs positively promotes the risk-taking of portfolio companies.

## **4.CONCLUSION**

This paper believes that the dimensions of EO cannot be simultaneously supported by these four kinds of value-added services, from another point of view, one of value-added service variables may not support every dimensions of EO at the same time. Based on the above analysis, from the perspective of value-added services we can know that the original social network of portfolio

companies can be expanded under the support of network resources from VCs, which lead easily obtaining the information resources, technical resources and human resources to promote enterprises' innovation and proactiveness. With the relationship in financial world and capital operation skills, VCs assist the portfolio companies to continuously raise the follow-up finance, which lead greatly investing in R&D innovation activities and hiring outstanding technical talents to accelerate technology innovation with high salary. It is possible for enterprises to introduce new products into market ahead of competitors with the support of sufficient funding. As well the portfolio companies are able to develop new technologies and open new market under the support of follow-up finance. Consequently the follow-up financial support has the certain positively promotion on innovation, proactiveness and risk-taking of EO. The strategic support from VCs can assist enterprises to effectively identify potential market opportunities and promote portfolio companies' proactiveness. While the management support from VCs means assisting portfolio companies to optimize incentive and constrain mechanisms for enhancement the innovation passion of management and R&D employees so as to promote the entire enterprises' innovation.

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# THE POLITICAL DEVELOPMENT OF ENTREPRENEUR TERMINOLOGY AND THE SEARCH FOR A MODERN UNIVERSAL DEFINITION

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## ABSTRACT

*The French economists, in the eighteenth century, observed entrepreneurs as risk takers with uncertain returns and concluded they were equilibrating agents under classical economic theory. These economists recognized there was a distinction between entrepreneurs, in pursuit of ideas, and capitalists, in pursuit of profits. The Austrian economists observed entrepreneurs utilizing the resources of stakeholders to create new value which benefited stakeholders. These economists noted positive relationships with stakeholders were essential to the success of entrepreneurs and critical for the success of business enterprises. British and American economists noted the entrepreneurs tended to resemble small business owners in pursuit of profits. The research suggested entrepreneurship was the process of working with people to create competitive advantages in new business enterprises. The study concluded entrepreneurs were rare and unique individuals with special talent.*

*Keywords: Entrepreneurship Terminology, Entrepreneurship Definition, Competitive Advantage*

## 1. INTRODUCTION

The classical definition of entrepreneur was introduced and developed by the French economists in the eighteenth century and enhanced by the Austrian economists in the nineteenth century. Early confusion over entrepreneur terminology resulted from the British economists attempting to include the capitalist in the definition and the American economists attempt to show profits as the motivation for new business development by entrepreneurs in the same manner as the capitalists in pursuit of profits.

### 1.1 The French Described the Word, Entrepreneur

Entrepreneur, as a common word, originated with the French economists in the eighteenth century based on their observations. French economist, Francois Quesnay (1694-1774), observed an entrepreneur as one who took risks while organizing production and distribution of new products, using new methods, for new markets (Formaini, 2001). French economists Anne-Robert-Jacques Turgot (1727-1781) concluded entrepreneurs were risking their capital due to a lack of institutional financial markets (Formaini, 2001).

French economists, Jean Baptiste Say (1767-1832) supported the equilibrium theory because production was undertaken to satisfy consumption (Formaini, 2001). French economists, Leon Walras (1834-1910) concluded the demand for resources by the not-for-profit entrepreneurs were derived from the demand for goods and services. Walras advocated the removal of barriers to create full employment (Formaini, 2001).

Many of these early French economists studied the work of Irish-born Richard Cantillon (1680-1734) who described the entrepreneur as an individual taking risks by buying goods at a fixed price to be sold at an uncertain price. Cantillon recognized a distinct role for the entrepreneur, which was different from the role of the capitalist or lender of funds, who received a fixed rate of return (Cornelius, 2006).

### 1.2 The British Abridged the Word, Entrepreneur

The French word, entrepreneur, was contracted by the British economists in the nineteenth century with their initial omission. British economist, Adam Smith (1723-1790), discussed the factors of production and remuneration rates without defining a role for the entrepreneur. He saw the capitalist as the critical factor of production (Formaini, 2001).

British economist, David Ricardo (1772-1823), saw the capitalist as the hero of economic development striving to increase profits. He concluded the owner was viewed as a villain by collecting fixed rent, while the worker was viewed as a victim, by over-breeding thus keeping wages low (Formaini, 2001). British economist, Jeremy Bentham (1748-1832), identified entrepreneurs as borrowers and concluded charging fixed interest rates on their loans was part of the innovative process (Formaini, 2001).

British economist, John Stuart Mill (1806-1873), observed no distinction between the entrepreneur, who directed resources, and the capitalist, who supplied resources, for risk taking enterprises. Mill advocated progressive taxation, compulsory education, and international trade for expansion of capitalism. Mill was a supporter of universal suffrage and working class representation in the government (Formaini, 2001).

### **1.3 The Austrians Expanded the Word, Entrepreneur**

The word, entrepreneur, expanded after the British contraction, with Austrian economists in the twentieth century. Austrian economist, Carl Menger (1840-1921), observed entrepreneurs gathering information, directing production and assuming financial risks in new business enterprises (Salerno, 2011). Austrian economist, Friedrich von Wieser (1851-1926), saw the entrepreneur as an individual who recognized and exploited new opportunities in the economy (Formaini, 2001).

Austrian economists saw entrepreneurs creating new value for profits using the resources of investors, lenders, employees and suppliers. Austrian-born economist, Joseph Schumpeter (1882-1950), believed the essential function of the entrepreneur was introduction of new products, new technology or new types of organizations. He felt entrepreneurs were destabilizing agents in the economy, who sought profits by innovation (Cornelius, 2006).

### **1.4 The Americans Revitalize the Word, Entrepreneur**

The American economist, Herbert Davenport (1861-1931), argued entrepreneurs were the engines for production, bearing the risk of not knowing the price of their output or the cost of future input. He argued those things produced and distributed were items of wealth and there was no single principle governing economic activity. Davenport noted profits were compensation to entrepreneurs for superior visionary and managerial attributes (Formaini, 2001).

American economist, Frank Knight (1885-1972), concluded successful entrepreneurs achieve profits from their superior judgment while assuming risks. He argued profits came from the inherent unpredictability of human activity and the superior judgment of individuals in a business endeavors. Knight concluded entrepreneurs achieve profits from the uncertainty (Formaini, 2001).

Entrepreneurs were not easily defined in the modern industrial world as corporations tended to dominate free enterprise and markets. Innovation became institutionalized as scientists, engineers, and planners were hired and employed to develop new products and new techniques. The managerial control over the activities of a business was separated from the financial responsibility of owners. The confusion with the role of the entrepreneur continued in academic literature and government policies.

## **2. LITERATURE REVIEW**

Osborne et al (2000) used twelve behavioral classifications of the entrepreneurship definition to group the work of the earlier economists. The groupings covered the various elements of business and included a number of historical contributors to the definition of an entrepreneur. The groupings have been modified and reduced to five categories limited to the previously noted historical contributors in the research:

1. Innovator, contractor and employer: Quesnay, Bentham, Wieser, Schumpeter

- |   |   |
|---|---|
| 2. Coordinator of economic resources:       | Wieser, Schumpeter and Davenport.           |
| 3. Decision maker who assumes risk:         | Cantillon, Menger, Wieser Mill, and Knight. |
| 4. Owner and supplier of financial capital: | Smith, Turgot, Wiser and Ricardo.           |
| 5. Industrial leader and superintendent:    | Say, Mill, Menger, Wieser, and Schumpeter.  |

Cornelius et al (2006) summarized the phenomenon of entrepreneurship as being caught between the drawbacks of a new research discipline and the need to achieve knowledge maturity. They felt knowledge development, moving toward maturity, should reflect an internal orientation, topic stabilization, a research community and theoretical specialization. They concluded there was an emerging mature understanding of the entrepreneur and its role in society with the research becoming increasingly self-reflective.

Reader and Watkins (2006) noted entrepreneurship lacked a conceptual framework in which people can identify its distinctive contribution to business management research and development. They concluded the field of research for entrepreneurship was fragmented into clusters and agreed with Cornelius et al most entrepreneurship scholars were very narrowly focused and most colleges were small with transient faculty. Their work suggested the lack of a universally accepted definition contributed to fragmentation.

### **2.1 The Entrepreneur Defined as a Coordinator**

Adelman and Marks (2009) defined an entrepreneur as an individual who assumes risk and starts a new business enterprise to combine resources to produce goods and services valued more highly than the sum of its parts. While the definition supports a concept of added value, with the value being greater than the sum of the parts, it does not support the concept of creating a new competitive advantage.

Hisrich, Peters and Shepherd (2010) defined an entrepreneur as an individual who takes initiative to use resources and bear financial risks in a new business enterprise. They concluded entrepreneurship was the process of creating new value by using resources and assuming risks. The definition was consistent with the earlier definitions from the French and Austrian economists. The European definitions supported new business venture creation as an underlying principle.

Mariotti and Glackin (2010) defined the entrepreneur as a person who organizes and manages a venture, assuming all risks, for the possibility of a potential return. They also defined a venture as the buying and selling of products and services for profits. The definition would include any individual in a clear position of leadership, for a business enterprise, including the owners and the management. The argument over the distinction between entrepreneur and capitalist contributes to a misunderstanding regarding the role of entrepreneurship in society.

### **2.2 The Entrepreneur Defined as an Innovator**

Scarborough and Zimmerer (2003) defined the entrepreneur as an individual who creates a new business for the purpose of achieving profit and growth by identifying the business opportunities and assembling the necessary resources. This was a definition with the notion of creativity and capitalization implying entrepreneurs are profit driven and growth oriented. Most small business owners would be considered entrepreneurs, waiting for low risk opportunities or looking for the right circumstances.

King (2006) defined an entrepreneur as someone who starts a new business to offer new or existing products and services into new and existing markets. He felt his short definition did not focus on the characteristics required for entrepreneur activity. Kings concluded entrepreneurs had a unique way of thinking in solving problems with a predisposition to take personal risks. A better definition was required to develop a way of thinking and a set of behavior for creative solutions to problems with the purpose of deriving economic and social benefits.

Nass (2006) described the entrepreneur as a special kind of leader who initiates a new business to make an idea or invention economically feasible and marketable to customers. He concluded with Schumpeter on an entrepreneur being a profit catalyst in a capitalistic society through innovation. Nass also observed entrepreneurs were considered a special breed of differing people with many common characteristics in the pursuit of a competitive advantage through their creativity.

Kuratko and Hodgetts (2001) provided a description of the entrepreneur as an innovator or developer who recognizes opportunities and convert those opportunities into workable and marketable ideas by adding value through time, money, or skills. They noted the entrepreneur assumes the risks of the competitive marketplace to implement their ideas and realizes the rewards from their efforts.

### **2.3 The Entrepreneur Defined as a Decision Maker**

Macko and Tyszka (2009) concluded entrepreneurs generally have a higher level of self-confidence than other people. They confirmed there was no difference in risk taking between entrepreneurs and managers even though there was significant difference between managers and small business owners. They noted entrepreneurs had a more positive attitude toward skill related risks than chance related risks due to their self-confidence. The research could not distinguish between optimism and self-confidence.

Coulter (2003) concluded an entrepreneur was someone who initiates and actively operates a business venture taking a risk in pursuing opportunities. Kaplan (2003) described the entrepreneur was someone willing and eager to create a new business venture. Lambing and Kuehl (2007) stated the entrepreneur as a person trying new combinations of products, processes, markets and resources. The definitions tended to suggest entrepreneurs were driven more by ideas rather than driven by profits reinforcing the distinction between the entrepreneur and the capitalist.

Byers, Dorf and Nelson (2011) defined the entrepreneur as a person who understates an enterprise or a business with a chance of profit. They concluded entrepreneurship was focused on the identification and exploitation of previously unexploited opportunities. The essential element of creativity or innovation was not captured in the definition even though those elements are critical for technology driven ventures.

## **3. Discussion and Analysis of Definitions**

Any contemporary review of entrepreneurship would begin with new venture creation and a definition of entrepreneur supporting new business development. The classical definitions tended to be inclusive for identifying entrepreneurs as any small business owners who start new businesses. This well accepted concept would also include the imitators and other hustlers as entrepreneurs in legal or illegal ventures throughout the world. Hustlers would be defined as energetic individuals engaged in economic activities, often using questionable means, to obtain something of value, possibly by deceitful and underhanded methods in the business.

The small business owner would be an entrepreneur by most published definitions. Professionals (in law, medicine, accounting and other fields) who start a private practice would be entrepreneurs. Agents (in real estate, insurance, finance and other industries) who open a sales office would be entrepreneurs with their legal independence. Individuals (in gambling, prostitution, pirating and other questionable activities) who hustle in the public streets would also be entrepreneurs. These small business owners are business people seeking profits by the use of their talents, skills and resources in the creation of new businesses.

### **3.1 Coordinator of Economic Resources**

The French economists, Quesnay and Walras, observed entrepreneurs as primarily risk-takers who use resources to introduce, produce and distribute new or existing products using new or existing methods for new or existing markets. Austrian economists, Menger and Schumpeter, observed entrepreneurs building new organizations to take risks and introduce new products, new services or

new technology. American economists, Davenport and Knight, observed entrepreneurs taking risks as the engines of production with capitalism. These economists believed entrepreneurs created new value for stakeholders.

Stakeholders are individuals or groups who are affected by or can influence the operations of a business enterprise or an organization. The stakeholders include owners, investors, lenders, creditors, customers, suppliers, employees and government agencies plus those communities affected by the operations of the enterprise or the organization. Accordingly, successful entrepreneurship should have a positive impact on their stakeholders by definition.

The French economists observed entrepreneurs as risk taking individuals who created new value, using the capital resources of investors and lenders at a fixed price, to organize the activities of workers at a fixed price, for the production and distribution of goods and services. They noted a distinction between in the role of the entrepreneur and the role of the capitalist or investor, who may have actually owned the business enterprise. The French economists challenged the idea of entrepreneurs being motivated primarily or solely by profits. They saw Entrepreneurs as economic problem solvers.

The French economists recognized entrepreneurs may use their capital, out of necessity, to create new value or something new to satisfy demand for new products and services. However, French definitions for an entrepreneur did not include profits, even-though in most situations, profits may have been the underlying motivation for the business. Classical economic theory eliminated the existence of profits beyond the required return for the capitalist and the stated interest rate for lenders.

### **3.2 Innovator and Creator of New Value**

The French and Austrian economists developed an entrepreneurial concept for the creation of new value in business ventures. The French economists saw a distinction in the role of the entrepreneur versus the role of the capitalist, who provided capital resources for profit, or the merchant, who sold products and services for profit. The Austrian economists raised the importance of the entrepreneur as a creator of new value, who organize and risk resources for the possibility of profits.

British economist did not accept the distinction between entrepreneurs and capitalists. Their revisions to the French definition for an entrepreneur included risking resources and managing resources in pursuit of profits. The Austrian economists saw the entrepreneur as a creator of something new, a novelty, which differed from the capitalist who finance it and the merchant who sold it. They observed the entrepreneur as a critical driver for economic development and a creator of new value with innovation.

The American economists blurred the definition of an entrepreneur, by again focusing on profits as the primary motivation for any creativity and innovation. The essential risk and return elements of business, whether for-profit or not-for-profit, became the common underlying characteristics of an entrepreneur, who created something new. These underlying characteristics would describe: the capitalists, who financed it; the supplier, who produced it; the customer, who purchased it; or the merchant, who sold it.

Entrepreneurship was initially envisioned by Quesnay and Schumpeter as the creation of new value in the form of new products, new services, new methods or new types of organizations. Wealth creation and job creation were the by-products from the successful creation of new value using the resources of investors, lenders, employees and suppliers for the benefit of customers and society as a whole.

### **3.3 Organizational Leader and Manager**

An entrepreneur was described in the twentieth century as the responsible head of a business enterprise, who received profits as their rewards for risk taking. The role of the entrepreneur consisted of coping with the problems resulting from economic change. The classical theory of economic equilibrium assumed the cost of production was determined by acquiring capital at a certain

rate of return, hiring labor at a certain wage and using creative or innovative techniques in the production of products and services.

French and British use of the word, entrepreneur, in the eighteenth century and nineteenth century may have been consistent with earlier definitions, but the French tended to redefine its use. The British earlier definition from the thirteenth century was consistent by identifying an entrepreneur as a leader of certain economic activities. The definitions indicated an entrepreneur was one who undertakes responsibility for certain activities at some level of risk in return for some type of benefit.

### **3.4 Owner and Supplier of Capital**

Many politicians and some economists would classify all small business owners as entrepreneurs thus eliminating a distinction between the entrepreneur and the capitalist. The position may be supported by an observation of successful entrepreneurs (users of capital) becoming wealthy capitalists (sources of capital). The argument over the distinction between the entrepreneur and the capitalist can be extended into wealth created by stock manipulation versus wealth created by product innovation.

The British economists initially observed no separate role for the entrepreneur and no distinction from the capitalist who increased value by financing production and economic growth in pursuit of profits for their enterprise. The economists concluded the capitalist simply supplied money to the owner who provided employment for the workers. Business risks were shared by the owner and the capitalist, while workers, including the managers, risks only their continued employment. The British economists had a near view of entrepreneurs not playing any significant role in the economy.

The British economists eventually recognized the existence of entrepreneurs, but tended to undervalue their role in economic development. The definitions of entrepreneur envisioned by the French economists was weakened by British economists' inability or unwillingness to see a significant distinction between the entrepreneur, a user of resources, and the capitalist, a source of resources.

## **4. CONCLUSIONS**

Most of the published definitions of an entrepreneur include any individual who starts a business. These definitions may not capture the three essential elements of entrepreneurship as originally envisioned by the French and Austrian economists. The three essential elements of entrepreneurship would include: (1) using resources of stakeholders; (2) creating new value in the form of a competitive advantage with stakeholders; and (3) benefiting all stakeholders. Competitive advantage is an aggregation of the factors differentiating a business for a unique market position to achieve superior economic value.

An entrepreneur pursues ideas, using creativity, for a positive impact on investors, suppliers, employees, customers and the society as a whole. While a small business owner may resemble an entrepreneur, most small business owners pursue profits rather than new ideas. A precise definition would describe an entrepreneur as an individual, who uses resources of some stakeholders to create new value in the form of a competitive advantage with other stakeholders for the benefit of all stakeholders.

Entrepreneurs seek a competitive advantage through the direct involvement of stakeholders. The earlier definitions provided a distinction between the entrepreneur and the small business owner. This distinction may be important when examining the role of small business owners, who resemble the entrepreneur in new business creation, but do not capture the essential elements of entrepreneurship.

The difference between the entrepreneur, who created new value, and the inventor, who also created something new, was the use of resources from stakeholders to create a competitive advantage for the benefit of stakeholders. Inventors can be entrepreneurs and entrepreneurs can be inventors, but not

all inventors were entrepreneurs in creating a competitive advantage. Entrepreneurs were able to create and maintain a competitive advantage in new or existing markets by pursuing ideas.

#### **4.1 The Mythical Role of Small Business**

A cursory review of government census data would suggest: most small businesses were listed as profit seeking self-employed individuals and most small business employers were more motivated by profits than growth. An empirical approach would suggest: anyone can start a business at any time in their life; anyone can borrow money from family and friends to start a business; and, anyone can hire people to work in a business. Most small businesses tended to be imitators, who enter existing markets to compete on price without a competitive advantage.

The difference between the entrepreneur, who uses stakeholder resources to benefit customers, and small business owners, who also uses stakeholder resources to benefit customers, is the creation of new value in the form of a new competitive advantage. Entrepreneurs create competitive advantage in new businesses, while small business owners extends existing value with new business ventures offering existing products, services, methods and technology. All of the participants take some level of risk in expectation of some level of benefit as stakeholders.

Entrepreneurs and other small business employers appeared to have been dominated by the political and economic power of large corporate employers. Classical economic theory did not anticipate the growth of large corporate employers with free enterprise system. The classical theory envisioned highly competitive fragmented industries. However, government policies and judicial decisions tended to favor the corporate employers over the small business employers including entrepreneurs. Eventually, the large corporations tended to acquire and absorb successful small businesses, which were consolidated into their revenues.

Most small business employers tended to resemble entrepreneurs as they obtained financial resources from their investors and lenders to hire employees and purchase products and services from suppliers and strategic partners to create new products and services for new customers. Some of these small business employers appeared to encompass the three essential elements of entrepreneurship: (1) using resources of stakeholders; (2) creating new value in the form of a competitive advantage with stakeholders; and (3) benefiting all stakeholders.

#### **4.2 The Important Role of Entrepreneurs**

Entrepreneurs were the drivers for economic growth by building successful corporations in competitive markets. Entrepreneurs were individuals who use resources of investors and lenders, to create new value in the form of new competitive advantage with employees and suppliers, for the benefit of their customers and society as a whole. Entrepreneurs created new jobs and eliminated old jobs while they built new businesses and destroyed old businesses with their creativity. Entrepreneurs appeared to be the economic engines for growth and development in a free enterprise market driven society.

Entrepreneurs are able to incorporate the three essential elements in their new business enterprise due to their rare and unique talent. The essential elements of entrepreneurship among the small business ventures would be: (1) the use of resources from stakeholders; (2) the creation of a new competitive advantage; and (3) the benefits for all stakeholders. Successful entrepreneurs create new value in the form of a sustainable competitive advantage working with talented and skilled stakeholders while the unsuccessful entrepreneurs create new value with unsustainable competitive advantage.

Many of the current government programs and policies tended to focus on existing small businesses and large businesses with no competitive advantages in order to temporarily protect employment. Many, if not most, of these businesses will eventually terminate after absorbing millions of dollars in government benefits in the form of subsidies, regulations and tax breaks. These government and

private funds could be more targeted toward research for creation of new products and new services to solve a wide variety of political, financial and technical problems in the United States and the world.

#### **4.3 The Impact of Precise Terminology**

There is a need for a more precise definition of an entrepreneur to eliminate the confusion of multiple and conflicting definitions used in academics and government. A more precise definition of entrepreneur must include the essential elements of entrepreneurship as envisioned by the early economists. Entrepreneurs should be defined as individuals who use the resources of some stakeholders, to create new value in the form of a new competitive advantage with other stakeholders, for the benefit of all stakeholders.

A more precise definition of entrepreneur would enable politicians and economists to focus their attention on government programs and policies on economic development. Industries are created and destroyed by government programs and policies. The government could begin to create new or better opportunities for entrepreneurs to create new value in the form of competitive advantages in dynamic international and global markets for products and services in and out of the United States

A more precise definition for entrepreneur would help attract children and young adults into economic development through entrepreneurial activities. It would encourage better new business development with less imitation and more creativity using the essential elements of Entrepreneurship. Young adults could be encouraged and supported as potential new entrepreneurs, who seek competitive advantages in evaluating and starting new businesses. Societies need new and better ideas for solving problems and improving the lives of their citizens in the form of entrepreneurship.

The worldwide population growth will and should continue to create new opportunities for small business self-employed and other individuals seeking employment. Small business employers must be supported and encouraged to grow as entrepreneurs by government regulations and tax policies. A more precisely defined entrepreneur could continue to help raise the living standard in market economies throughout the world as part of international economic development. Entrepreneurs would use the limited resources of some stakeholders to create new value with other stakeholders, for the benefits of all stakeholders.

This research is incomplete and further research will be needed to confirm a more precise definition for entrepreneur. Further consideration should be made on including competitors as part of the stakeholders in any business enterprise or endeavor. The need for a more precise definition of entrepreneur may be part of a need for a more consistent definition in academics, government and industry.

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**TITLE IPADS IN THE BUSINESS CLASSROOM: AN ANALYSIS OF THE JAY S. SIDHU SCHOOL  
OF BUSINESS & LEADERSHIP'S IPAD INITIATIVE**

Jennifer Edmonds  
Matthew Ruch

**ABSTRACT**

Over the past few years, iPads have become increasingly utilized in college classrooms across a variety of disciplines and levels of education. This research project aims to investigate the question: do iPads enhance or detract the undergraduate business classroom environment? The iPad Initiative was launched in the fall semester of 2012 in the Sidhu School of Business & Leadership at Wilkes University, a small liberal arts school in Northeastern Pennsylvania. iPads were distributed to all incoming freshman to the School. Each of these students was enrolled in a common business course, Integrated Management Experience (IME) and the data was collected from this incoming class of fifty students. Preliminary findings suggest that iPads can enhance learning environments by increasing student attention and participation rates. With the addition of the iPads, students are more willing to go beyond lecture content by finding and sharing their own examples. The students who actively participate, or the responsible students, seek to use iPad technology to their advantage, rather than letting it distract them from their education. Less responsible students are more prone to engage in distracting behaviors, such as non-relevant web-browsing, social networking and gaming. Other distractions were found to include the instructor's ability to integrate and demonstrate iPad technology, student willingness to incorporate iPad technology and general student disinterest. The increased levels of student participation, engagement and performance outweigh the negative perceptions against iPad devices, thus justifying the student and institutional investment costs. The results of this study will be used to reform current classroom practices to minimize such distractions.

# EDUCATION EXPENDITURES, POLITICAL AFFILIATION AND TEACHER PAY

Miles Smayling

## ABSTRACT

*The National Education Association and the American Federation of Teachers have for years sought increases in educational spending. In more recent times, it has become unusual to talk about expenditures and more typical to refer to the spending as investment. Both of these labor organizations are supported by dues paid by the members so it would seem likely that their actions should be promoting the values and outcomes of those members. Over the last four decades while most measures of spending on education have increased dramatically, one that has remained relatively flat is average teacher pay. This paper takes a brief look at the inflation adjusted changes in two measures of education expenditures and the changes in real (inflation adjusted) teacher pay.*

## 1. INTRODUCTION

Labor organizations are created to advance the interests of their members. The dues that they collect are intended to support activities that advance worker goals. Historically, union spending has involved monies devoted to contract negotiation, contract administration, organizing, and union advancement. The last of these categories tends to be much more prominent in the public sector. In that venue a large portion of union advancement may involve supporting political candidates that are likely to direct more spending to areas that benefit union members.

In the United States, the last few decades have seen public employee unions give most of their money to candidates from the Democratic party. The desired outcome is having more tax revenues devoted to the groups the unions represent whether they be teachers, police, fire fighters or others. This paper looks at the political spending of the two biggest teachers unions in the United States--the National Education Association (NEA) and the American Federation of Teachers (AFT). It will examine whether such expenditures on political contributions have been associated with higher education spending and whether this has resulted in attaining what is arguably the union's ultimate goal of higher teacher salaries. Spending in this area is often justified as being not just spending, but instead an investment for a country.

Supporters of increased spending on education routinely refer to it as an investment, a viewpoint with empirical backing. Researchers have examined the linkage between education and earnings for decades (Becker, 1962, Rosen, 1983). Young people, in this framework are able to acquire human capital (education) and sell in on the labor market, garnering higher wages. Freeman (1971, 1975a) focused on the different returns that might be experienced in different fields and levels of study. One interesting finding has been that the rate of return on education declines with the level of educational attainment, because of increased opportunity costs. A high school diploma may yield from 16%-18% ROI, while a bachelor's degree nets 12%-14%. Given this situation, one can reasonably argue that a nation's spending on K-12 education is, in fact, an investment. An implied assumption in all such models is that individuals' possess accurate knowledge of the earnings associated with various choices of human capital accumulation.

## 2. MODEL

This paper's layout is fairly straightforward. The pattern of spending on education and teacher pay from 1969 to 2012 will be examined using publically available national data. The year 1969 was chosen as the starting point because an annual series on teacher salaries started at that time. Spending per pupil, Education Department spending and average teacher salaries will be considered. Education Department spending starts in 1980, when that entity was established. Political contributions by the NEA and AFT from 1989 to 2012 are utilized. Figure 1 clearly shows that both major national teacher labor organization strongly favor the Democratic party, as one might well

expect. This leaves open the question of whether this support yields members tangible, financial benefits.

**Figure 1**

**Group Contributions to Political Party**

*Note: Percentages may not add up to 100% as money can be given to third party candidates or outside spending groups and PACs not affiliated with either party.*

Rank	Organization	Total '89-'12	Dem %	Repub %	Tilt
1	<a href="#">ActBlue</a>	\$76,137,468	99%	0%	
2	<a href="#">American Fedn of State, County &amp; Municipal Employees</a>	\$65,160,408	69%	0%	
3	<a href="#">AT&amp;T Inc</a>	\$50,295,491	43%	56%	
4	<a href="#">National Education Assn</a>	\$49,769,888	64%	4%	

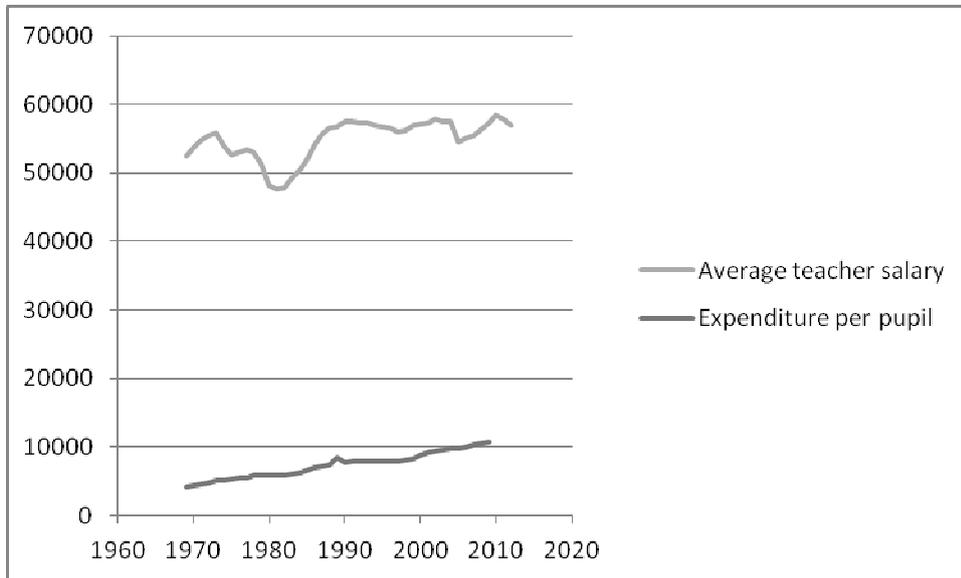
Source: opensecrets.org

**3. RESULTS**

Figure 2 reveals a relatively constant pattern growth in inflation adjusted spending per pupil over the period 1969-2010, the most data available. While per pupil spending was persistently rising, teacher pay fluctuated substantially but ended about where it began. Figure 3 exhibits a similar trend for growth in Education Department spending without a commensurate long term increment in average teacher salaries. The “spike” in Education Department spending in 2009 was based on stimulus spending and was a one-time event.. Figure 4 contains information arranged around the political control, at the executive level. As can be seen from the table teachers tended to do much better during Republican presidencies, at least in terms of earnings. This seems counter-intuitive, given the strong political alliance between unions and the Democratic party. The incidence of positive outcomes for teachers during Republican terms repeats itself so often that simple coincidence would seem unlikely.

**Figure 2**

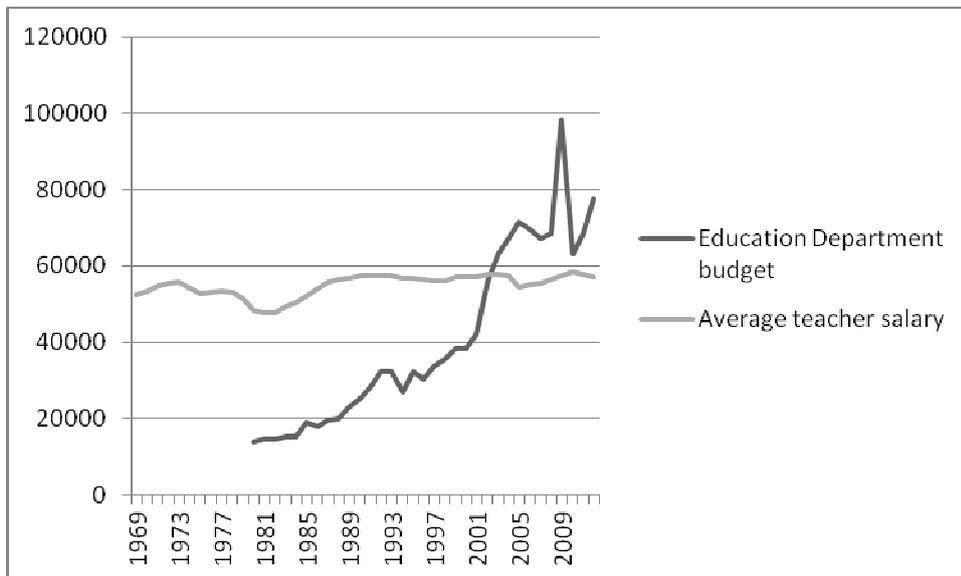
**Teacher Salaries and Per Pupil**



Source: Digest of Education Statistics, 2012, Table 191

**Figure 3**

**Teacher Salaries and Education Department Budget**



Source: Digest of Education Statistics, 2012, Table 83

**Figure 4**

**Teacher Salaries and Education Expenditures during Presidential Terms**

President	Nixon	Ford	Carter	Reagan	Bush	Clinton	Bush	Obama	Total
Change in real spending per pupil	911	455	201	1698	406	1258	1559		6488
% Change in real spending per pupil	21.6	8.9	3.6	29.4	5.4	15.9	17.1		154.2
Change in real Education department spending	N.A.	N.A.	14,011	8094.8	9643.3	9599	26693.2	8825.8	63389
% Change in real Education department spending	N.A.	N.A.	N.A.	54.9	42.3	30.0	63.4	11.4	452.4
Change in real salary	1,548	-603	-5754	9,082	547	-33	23	-270	4492
% Change in real salary	2.9	-1.1	-10.7	18.9	.9	-.01	.01	-.4	8.5
% Teachers with Masters degrees	27.1		37.1	49.3	52.6	54.5	56.0	60.4	

Source: Digest of Education Statistics, 2012, Tables 73, 83

**4. CONCLUSION**

The National Education Association and the American Federation of Teachers have directed most of their political support to the Democratic party over the years. They have been rewarded with significant increases in spending on education. Surprisingly little of these additional funds have filtered their way down to actual increases in teacher salaries,

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## A POSSIBILITY OF PREDICTING JOB PERFORMANCE USING PUPIL SIZE

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### ABSTRACT

*It is known that pupil size relates to interest by previous researches. But the relation between vocational preference measured by pupil size and future job performance was not reported, and this is the obstacle of pupil size to realize practically in commercial industry as vocational preference indicator. This report examines its relation. Company A's data of management by objectives (MBO) and Behavior evaluation are collected in this research. Examinees are 30 employees of Company A. They took pupil size test just after joining company to measure vocational preference. After about three years from its test, they have each MBO and Behavior evaluation data. In this report, relation of pupil data and those evaluation data is analyzed. Based on those data, there is significant difference of mean of pupil size by MBO evaluation rank by one-way analysis of variance. By Tukey's multiple comparison, MBO evaluation rank which shows above sales target has bigger pupil size than below one significantly. Also, there is clear correlation between Behavior evaluation and pupil size. Correlation coefficient between those is all significant, Behavior evaluation total point has .56, Organizational behavior has .56, Job-processing behavior has .42, and Value-sharing behavior has .41. Based on these results, pupil size can be considered as predictor index for future job performance.*

**Keywords:** Vocational preference, Pupil size, Job performance, Management by objectives evaluation, Behavior evaluation

### 1. INTRODUCTION

In companies' screening process for new hire, aptitude test has been implemented for many years to predict future business performance of candidates. Correlation between results of the test and future business performance after joining company, so called validity, has been big concern of human resource department. Validity of paper-based aptitude test has studied ever. There are 3 types of paper-based aptitude test, characteristic, ability, vocational preference.

Super (1957) mentioned vocational preference determines effort and continuousness of personal career. This report, focusing vocational preference test, examine validity to future job performance by existing big Japanese company. In addition to established vocational preference index of paper-based test, this report deals with new index, pupil size.

### 2. RELATED WORKS

In terms of characteristic test, validity of big five has been studied. For example, Barrick & Mount (1991) reported Conscientiousness shows .20 of validity coefficient, clarifying big five can predict future business performance. Also Hough (1992), Salgado (1997), Judge & Bono (2001) confirmed validity of big five. In terms of ability test, Hunter & Hunter (1984) reported from .23 to .56 of validity coefficient. Also Pearlman, Schmidt & Hunter (1980), Schmidt, Hunter & Caplan (1981) confirmed validity for business performance. In terms of vocational preference, Ryan & Johnson (1942) researched validity at sales representative and technical support in computer company, reported employees with high job performance shows high score of vocational preference score for their current job, and those with low job performance shows low score of it. Strong (1943) noted same results in advertising company. Based on these results, Carter (1944) pointed vocational preference test has validity for job performance, and can be used effectively in corporate screening process. Holland's RIASEC test which asks examinees about yes / no / Not Applicable to 160 numbers of different jobs has been major vocational preference test.

For measurement index of vocational preference, In addition to previous index, Suzuki & Nakayama

(2010) demonstrated pupil size can be alternative indicator for vocation preference. They showed clear correlation between subjective vocational preference measured by paper-based questionnaire and pupil size. Well-known research of Hess (1965) and Murai et al (1998) are the basis of their research. Hess revealed pupil size responds to subjective interest first, used pornography to figure out relation between interest and pupil size. After his research, Murai et al used TV program, and validated that pupil size responds to subjective interest of viewer.

To use new predictor variable like pupil size, it is known that it needs both reliability and validity. Reliability consists of internal consistency reliability, stability, interrater reliability. For index of pupil size, test-retest reliability is suitable. Suzuki and Nakayama (2010) clarified its reliability already. Validity consists of content validity and predictive validity. For index of pupil size, predictive validity is suitable. No reports have shown predictive validity of pupil size. Suzuki and Nakayama only noted correlation between pupil size and subjective vocation preference, did not deal with relation of pupil size to any performance scores. As mentioned, validity is essential for candidate screening test in commercial industry, so possibility of predicting job performance using pupil size is needed to be researched.

### **3. EXPERIMENT**

#### **3.1 EXAMINEE**

30 Employees belong to Japanese big company named Company A here, listing first section of the Tokyo Stock Exchange, which industry and number of employee cannot be published by confidential demand. Age from 22 – 25 years old at pupil test (25 – 28 years old at analyzed period), all have bachelor or master degree, all 3 years continuous working at Company A, and they all have each job performance evaluation. In this company, 3 years can be considered as not trainee but full-fledged. They are all sales personnel. All Japanese, mother language is Japanese. All have good view.

30 employees are selected by criterion stated below among 67 employees with same experienced year in Company A. They all belong to same department, because different department have different market environment, and it may influence individual result of evaluation. They all have same supervisor. Their rank of ability test which implemented before joining company belongs to middle rank. Employees with very high and low rank of its test have cut off because big difference of ability may influence individual result of evaluation.

#### **3.2 STIMULUS**

Six words are prepared to use in pupil test. Each word is shown on PC screen, 65cm from examinee, 20 inch CRT display. Six words are listed Table 1 (in experiment, each word was shown in Japanese). They represent name of industry. Word 1 represents industry which company A belongs to (industry name is masked for confidential demand in Table 1, but in experiment real name of industry is shown on PC screen to examinee). These industry words are selected with considering A's employees' comment about their interest, and controlling word familiarity and mora length.

To control the depth of knowledge to specific industry, Human resource department of Company A is asked to present main industries that employees have taken screening examination. Then the department shows 10 industries. These industries are considered that examinees have industry knowledge to some extent. If there is industry that examinees have knowledge much, and one that they have no knowledge, this might influence to the results of experiment by the variable of amount of knowledge. In this report, as stated after, the experiment is implemented just after joining company, so specific knowledge of Word 1 has not been built up yet. Industry knowledge of Word 1-6 does not seem to differ much.

Word familiarity in this Japanese corpus is evaluated from 1 to 7 (Amano et al, 1999), with 1 is the most difficult, 7 is the easiest to be understood. It must be controlled because in case a word with low word familiarity shows on PC screen, examinee may respond by not preference but recognition difficulty. In this experiment, word familiarity is controlled from 5.5 to 6.5 as Table 1. Preliminary

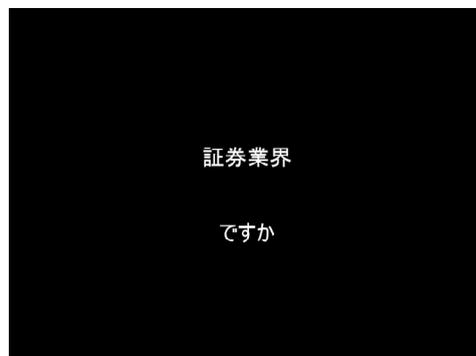
experiment shows there is no influence to pupil size when it ranges between from 5.5 to 6.5 of word familiarity. Familiarity data was applied to Japanese word which was shown in this experiment.

Mora length also must be controlled, because it may influence to brightness of screen. Each word is shown like Figure 1 on PC screen. Each industry word from Table 1 and auxiliary verb about question word like “is it” in English shows in PC screen. The example of Figure 1 is about “is it security industry?” in English. If a word with long mora length is shown in this formula on PC screen, it may have bigger white area than one with short mora length, and bigger white area increases luminance of PC screen. It is known that luminance influences to pupil size, high luminance makes pupil size smaller (Murai et al, 1998), low luminance makes it bigger. Mora length is controlled from 7 to 8 in this experiment based on result of preliminary experiment.

Thus 6 words are selected from 10 industries words.

**TABLE 1  
WORD STIMULUS**

#	Word	Familiarity	Mora length
1	A industry	5.65	7
2	advertising industry	6.13	8
3	trading industry	5.85	7
4	security industry	5.75	8
5	manufacturing industry	5.86	8
6	travel industry	6.13	7



**FIGURE 1  
STIMULUS PAGE**

### 3.3 PUPIL TEST

NAC: EMR8 is used in this experiment with fixed camera besides PC screen to capture pupil size of examinee. Sampling rate of NAC: EMR8 is 60Hz. Chin desk is used to control head movement.

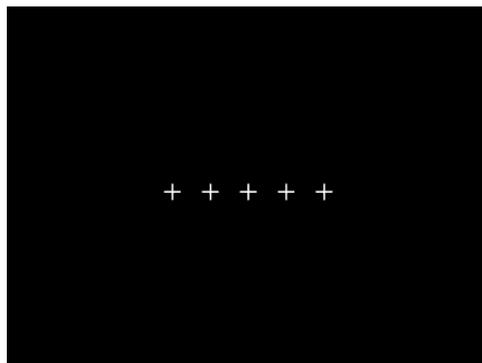
Flow of pupil test is stated in Table 2. Page A is instruction page, Page B is divider page like Figure 2, Page C1 – C6 is each stimulus page.

**TABLE 2  
FLOW OF PUPIL SIZE TEST (PRESENTATION ORDER FROM PAGE A)**

Page	Words	Display time (sec)
Page A	what kind of job do you want to be?	5
Page B	+ + + + +	2
Page C1	Is it A industry?	2
Page B	+ + + + +	2
Page C2	Is it advertising industry?	2
Page B	+ + + + +	2
Page C3	Is it trading industry?	2
Page B	+ + + + +	2
Page C4	Is it security industry?	2
Page B	+ + + + +	2
Page C5	Is it manufacturing industry?	2
Page B	+ + + + +	2
Page C6	Is it travel industry?	2

C1 shows Word 1 listed in Table 1, C2 shows Word 2, C3 shows Word 3, C4 shows Word 4, C5 shows Word 5, C6 shows Word 6. Time length of showing of each page is A for 5 seconds, B for 2seconds, C1 – C6 for each 2 seconds. Presentation order of pages is stated Table 2, but to control order effect, order of C1 to C6 is randomized. To clear residual effect of past stimulus, B is inserted between different C pages (e.g. between C1 and C2, B is inserted). To control rapid change of luminance of screen, divider page B consists of five cross like Figure 2, not black background only, because rapid change of luminance of screen may result to surprise emotion of examinee, which is not the emotion this experiment should capture. All pages consist of white character with black background, character size 40pt. Each word of industry only shows once, not again.

And importantly, no action is required to examinee while they are watching PC screen, just watching is needed. Because in case recognition activity like memory is required while watching, pupil may be influenced by such recognition-related mental activity. This experiment should capture not recognition but interest through pupil size.



**FIGURE 2  
DIVIDER PAGE**

Pupil size data cannot be measured while eye blink, because it covers eye physically. So its data is considered as error data and not used in analysis.

After preliminary experiment, it is found that pupil size may have approximately 500m seconds latent time, and after 1500m seconds, its response may not change with incremental movement to usual size. So pupil size date between 500msec to 1500msec is used in this analysis. And, pupil size is standardized considering difference of individuals. Usual pupil size is assumed the average of 5 sec

while examinee is watching A page, because A page does not include any specific information about industry. Setting its pupil size as 1.0. change ratio is calculated in each data frame of pupil size. After that, average of each industry word of pupil size is calculated as substantive pupil change by stimulus.

Pupil test was implemented just after examinees joined the company, the beginning of first year, to prevent examinees from making their knowledge much deeper than Word 2-6. Human resource department heard examinees have applied industries like Word 2-6, so the depth of knowledge to industry does not differ much overall. And the instruction that this questionnaire will not be used in examinees' evaluation was told to examinees. So Examinees do not have any motivation to control their emotion in specific aims.

### **3.5 VOCATIONAL PREFERENCE**

For each word of Table1, paper-based vocational preference test is implemented to each examinee. The test uses simple YES or NO question to each industry word. This test was implemented just after pupil test.

The instruction that this questionnaire will not be used in examinees' evaluation was told to examinees. So Examinees do not have any motivation to control their emotion in specific aims.

### **3.6 JOB PERFORMANCE EVALUATION**

All examinees have each yearly job performance evaluation data which consists of 2 elements, MBO (management by objectives) evaluation and Behavior evaluation. Both evaluations have been done from first year of joining company.

MBO evaluation measures the result of achievement of sales target. Sales target is set to each employee with discussion between supervisor and each employee at the beginning of year. All examinees are set each objectives related to sales revenue because they are all sales-rep as stated. Rank of achievement is evaluated at the end of year. Rank consists of seven grades, 7, 6, 5, 4, 3, 2, 1. 7 is the highest, and 1 is the lowest. Rank 4 means just above the target, and 5-7 depends on range of upside. 7 is rarely shown, there is no 7 rank in collected data here, so 6 is the highest substantially. On the other hand, rank 3 is just below the target, and 2-1 depends on range of downside. Here examinees have three years data of MBO evaluation, and at analysis in this report only treats third year data, because at first and second year, those period is considered for training. Third year is very important for employees, because this company tells sales employees that 3 years can be considered as not trainee but full-fledged. The number of each rank here is rank 1 (n=2), rank 2 (n=6), rank 3 (n=2), rank 4 (n=5), rank 5 (n=6), rank 6 (n=9).

Behavior evaluation consists of three components. First is Organizational behavior, second is Job-Processing behavior, and third is Value-sharing behavior. Organizational behavior deals with contribution to the team, consists of six components, such as team-working, mental toughness in organization. Job-Processing behavior deals with ability to make tasks done by individual, consists of eight components, such as service knowledge, proposal making. Value-sharing behavior deals with mind synchronization with company value, consists of six components, such as passion, hospitality. Total point of behavior evaluation is 200 points, 60 pts for Organizational, 80 pts for Job-Processing, 60 pts for Value-sharing behavior. Third year data is used here as well.

## **4. RESULT**

### **4.1 RELATION BETWEEN PAPER-BASED VOCATIONAL PREFERENCE AND PUPIL SIZE**

As shown in Table 3, 19 examinees answered they have interest to company A's industry, but 11 examinees do not have it in paper-based test. About 19 examinees, above half of them, this result is convincing because examinees have been working in company A for three years. Conversely, about 11 of examinees, they also have been working, but they have some possible reason like they did not want eagerly to join to company A, but they failed screening examination of other company, then they decided to work here out of necessity.

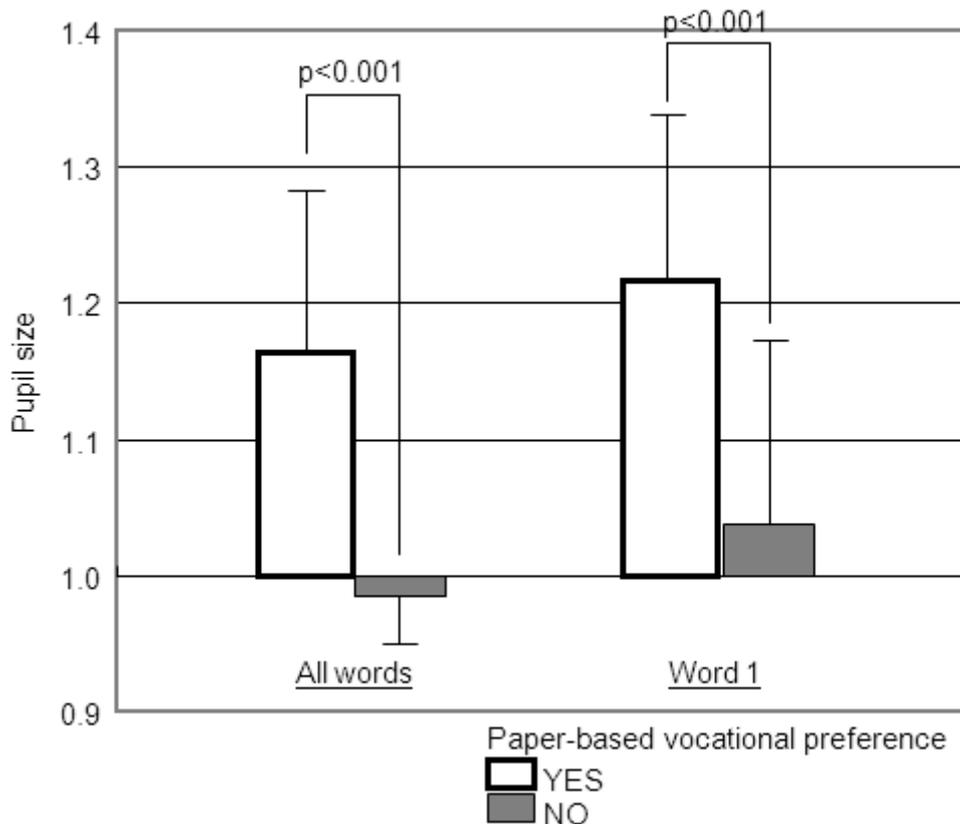
**TABLE 3**  
**RELATION BETWEEN SUBJECTIVE INTEREST AND PUPIL SIZE**

	n	Subjective interest (paper-based)		Pupil size
		YES	NO	
Word 1	30	YES	19	1.216
		NO	11	1.037
Word 2	30	YES	4	1.139
		NO	26	0.988
Word 3	30	YES	7	1.116
		NO	23	0.971
Word 4	30	YES	4	1.146
		NO	26	0.982
Word 5	30	YES	5	1.152
		NO	25	0.980
Word 6	30	YES	6	1.090
		NO	24	0.981

Table 3 shows clear relation between paper-based vocational preference and pupil size. In case of subjective interest YES, pupil size gets bigger than standardized usual size of 1.0. On the other hand, in case of subjective interest NO, pupil size gets smaller than that, except Word 1 which shows over 1.0 (1.037) at answer NO in paper-based test, but its above range is very small. Pupil size from .971 to .988 is observed at other words in case of subjective interest NO.

Figure 3 shows significant difference of mean of pupil size by paper-based vocational preference. By Welch's t-test, the mean of pupil size of positive (YES) vocational preference (n=45) is significantly bigger than that of negative (NO) one (n=135) at level of significance of 0.001 (t=9.74, df=49.49). Looking at Table 3, there are many positive (YES) answers of paper test to Word 1, but there are a few positive answers to other words. That is why Word 1 expresses Company A's industry, and examinees of this experiment belong to company A. So, it may be suitable to be analyzed separately based on the difference of nature of data, Word 1 and others. In terms of Word 1, Figure 3 also shows significant difference of pupil size by paper-based vocational preference. By t-test, the mean of pupil size to Word 1 of positive (YES) vocational preference is significantly bigger than that of negative (NO) one at level of significance of 0.001 (t=3.74, df=28). In terms of other words, mean of pupil size to those words of positive (YES) vocational preference is 1.125, and that of negative (NO) one is 0.980. By Welch's t-test, mean of pupil size of those of positive (YES) vocational preference is significantly bigger than that of negative (NO) one at level of significance of 0.001 (t=7.02, df=28.09). Considering interaction of paper-based vocational preference and word, by two-way analysis of variance, there is no interaction (p=.43), and main effect of word is not significant (p=0.62), main effect of paper-based vocational preference is significant (p<0.001).

These results show similar results with Suzuki's previous research, but sample size of Suzuki's research is very small. In this experiment, sample size is much bigger than that. This result increases positive proof of pupil size as the alternative variable of vocational preference.



**FIGURE 3**  
**MEAN AND SD OF PUPIL SIZE BY PAPER-BASED VOCATIONAL PREFERENCE**

#### 4.2 VALIDITY OF PAPER-BASED VOCATIONAL PREFERENCE

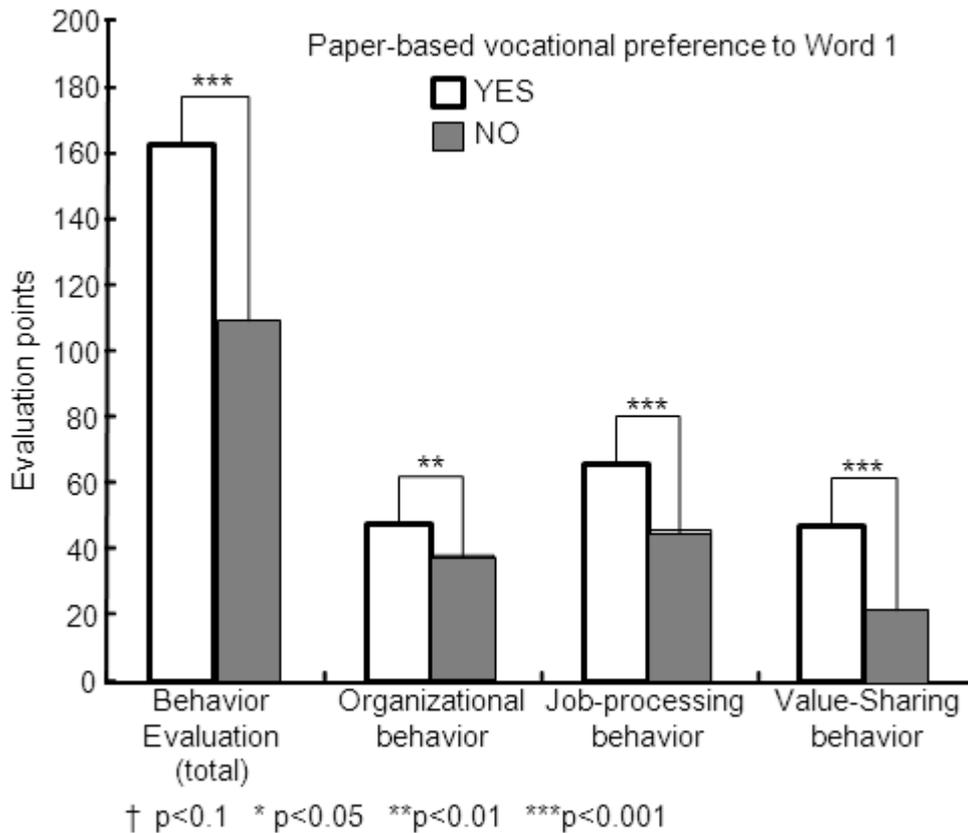
There are 19 positive answers and 11 negative answers to Word 1 in paper-based vocational preference questionnaire as stated. Table 4 shows the association between MBO evaluation rank and paper-based vocational preference to Word 1. By chi-squared test, those association is significant ( $X^2 = 22.68$ ,  $df = 5$ ,  $p\text{-value} < 0.001$ ). In YES at paper-based questionnaire, there are 18 employees above sales target which rank is 4, 5, 6. There is only one employee who shows below sales target in YES at paper-based questionnaire. On the other hand, in NO at paper-based questionnaire, there are 9 employees below sales target which rank is 1, 2, 3. There is only two employees who show above sales target. This result is considered as paper-based vocational preference to company which employees belong to has predictive validity to MBO evaluation that represents job performance to achieve sales target.

**TABLE 4**  
**VALIDITY OF SUBJECTIVE INTEREST TO WORD 1 FOR MBO EVALUATION**

Subjective interest to Word 1	MBO evaluation rank					
	1	2	3	4	5	6
YES	0	0	1	3	6	9
NO	2	6	1	2	0	0

Figure 4 shows mean of each behavior evaluation by paper-based vocational preference to Word 1, which clarifies significant difference at all categories by t-test. In total points, paper-based positive (YES) vocational preference to Word 1 links to higher behavior evaluation point than negative (NO) preference to same word significantly. In categories like Organizational, Job-processing, Value-

sharing shows same results. Employees which have positive vocational preference to Word 1 measured by paper-based questionnaire show higher behavior evaluation points than who have negative preference to Word 1 in all categories.



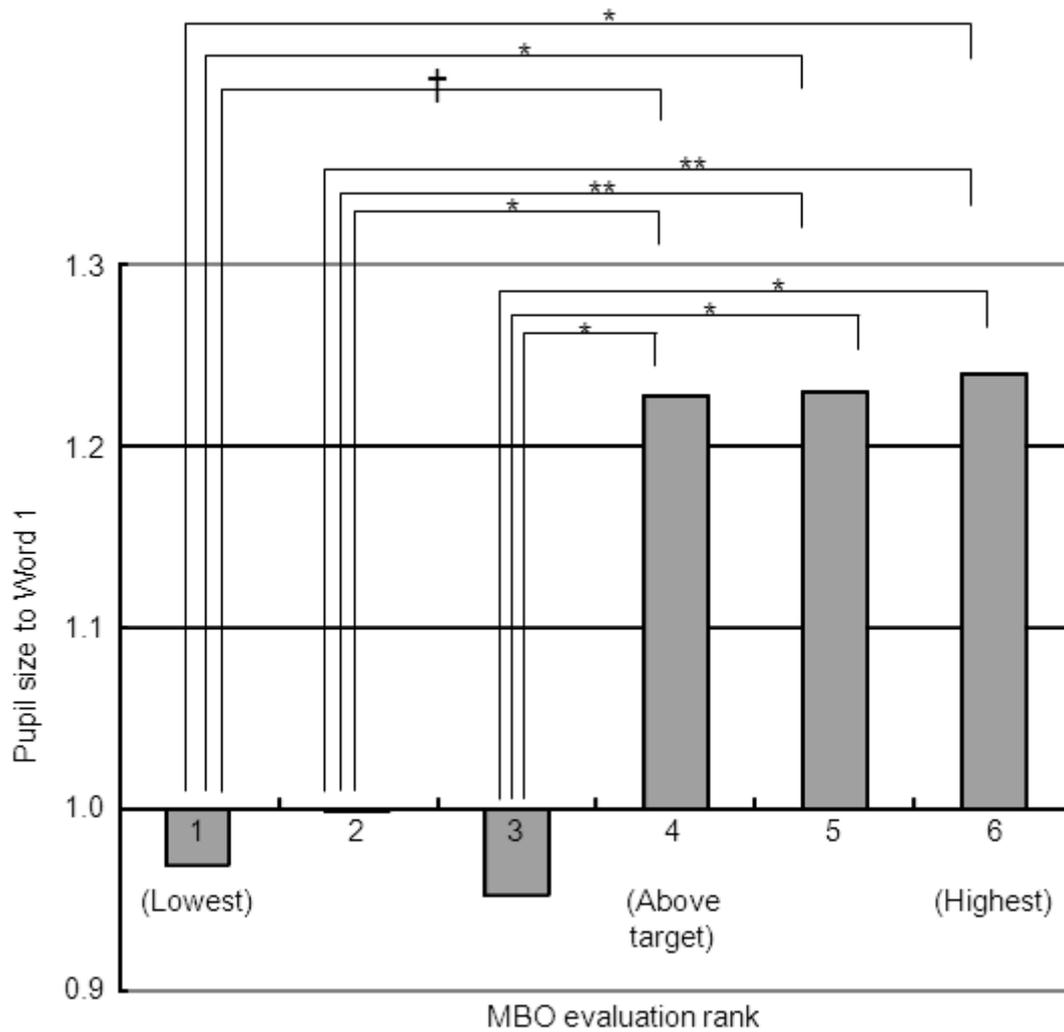
**FIGURE 4**  
**VALIDITY OF SUBJECTIVE INTEREST TO BEHAVIOR EVALUATION**

By these results, it is clarified that paper-based vocational preference has clear relation to both sales results measured by MBO evaluation and behavior measured by Behavior evaluation. Considering that previous studies which deal with relation between subjective vocational preference and job performance were implemented at the middle of 1900s as stated, it might be thought that required skills at that time were not complicated, so job preference was more important to job performance than today. That might be why vocational preference measured by paper test have predictive validity at that time. But these results in this experiment show vocational preference is still useful predictor variable in current industry environment. Recent years, skills required in industrial markets are becoming more complex and specialized. So companies may tend to think that skills are important factor of screening process. But vocational preference still may be considered as important aspect to predict future job performance.

#### 4.3 VALIDITY OF PUPIL SIZE

Relation between MBO evaluation rank and pupil size to Word 1 is analyzed in Figure 5. Based on one-way analysis of variance, considering condition as MBO evaluation rank (from 1 to 6), source of variance of condition to mean of pupil size to Word 1 is significant ( $F(5,24)=8.20, p<0.001$ ). And, result of Tukey's multiple comparisons is shown in Figure 5. MBO evaluation rank with above target line (rank 4, 5, 6) has bigger pupil size than below one (rank 1, 2, 3) significantly. Every pairs except

pair between rank 1 and rank 4 show  $p < 0.05$  or  $p < 0.01$ . Rank 4 is just above sales target, so it might be reason of its significant level. Considering rank 3 and 4 as just around sales target border line, and looking at only rank 1, 2 and 5, 6, there are significant difference of pupil size to Word 1 by MBO rank which higher MBO ranks show bigger pupil size to Word 1 in Figure 5.

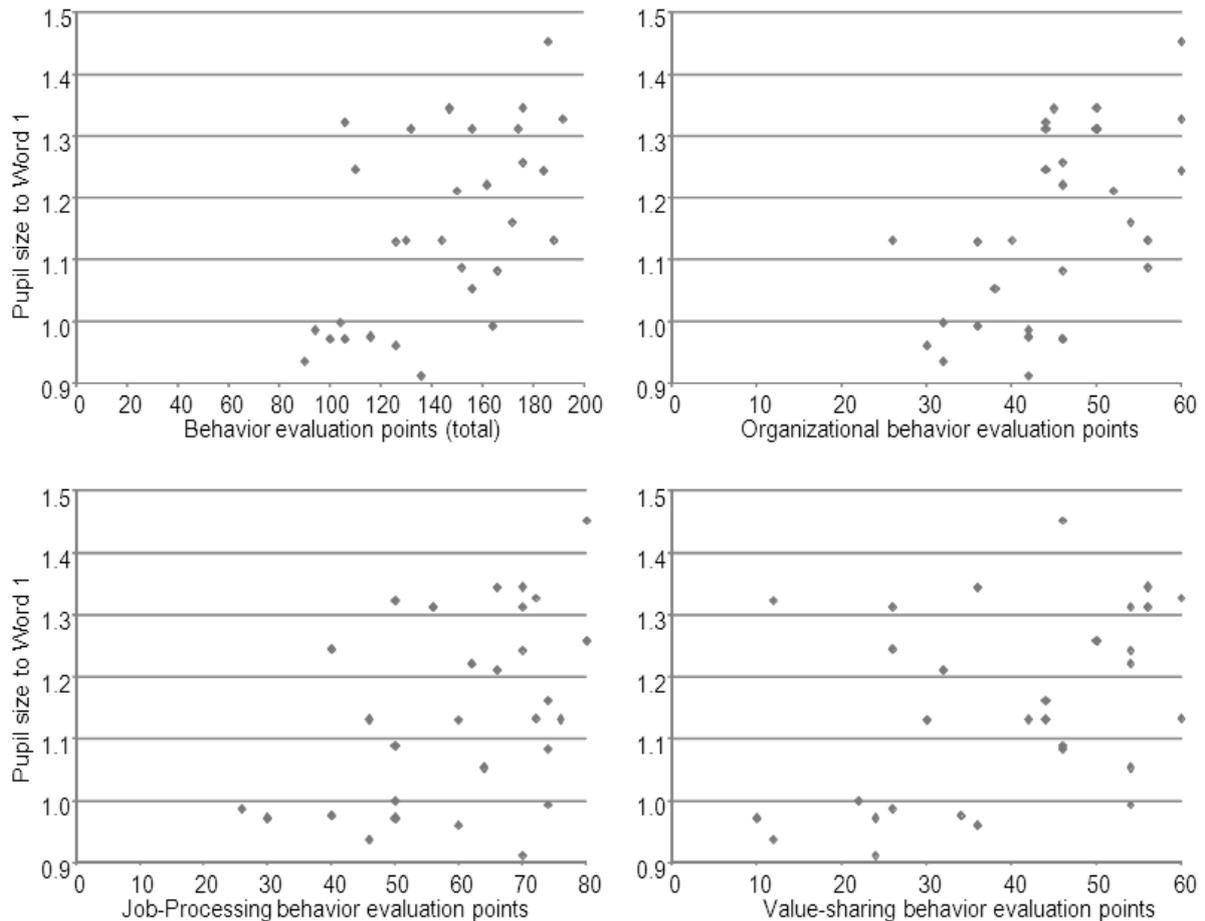


†  $p < 0.1$  \*  $p < 0.05$  \*\*  $p < 0.01$

**FIGURE 5**  
**VALIDITY OF PUPIL SIZE TO MBO EVALUATION**

Figure 6 shows correlation between Behavior evaluation and pupil size to Word 1. Correlation coefficient between those is all significant, like Behavior evaluation total points has .56 ( $p < 0.01$ ), Organizational behavior has .56 ( $p < 0.01$ ), Job-processing behavior has .42 ( $p < 0.05$ ), Value-sharing behavior has .41 ( $p < 0.05$ ) with pupil size to Word 1. Especially Organizational behavior has highest correlation coefficient of .56, which category deals with contribution to the team as stated. Vocational preference seems to heavily relate to team contribution aspects than individual activity which is dealt in Job-processing behavior category and Value-sharing activity. Organizational behavior deals with contribution to the team, such as team-working, mental toughness in organization. Job-Processing behavior deals with ability to make tasks done by individual, such as service knowledge, proposal making. Value-sharing behavior deals with mind synchronization with company value, such as

passion, hospitality. It is interesting correlation coefficient between pupil size to Word 1 and Organizational behavior points is higher than that between pupil size to Word 1 and Value-sharing behavior. Components of Value-sharing behavior like passion and hospitality seem stronger relation with preference, but it shows lower correlation coefficient than other two categories. Though, its category has significant correlation.



**FIGURE 6**  
**VALIDITY OF PUPIL SIZE TO BEHAVIOR EVALUATION**

## 5. CONSIDERATION

A possibility of predicting job performance using pupil size is confirmed in this report. Vocational preference is considered at first with the relation to Behavior evaluation, because Behavior evaluation relates to vocational preference relatively directly than MBO evaluation. MBO evaluation consists of many factors like market environment, luck and it relates to vocational preference indirectly. From such viewpoint, validity of pupil size to Company A's industry is considered as correlation coefficient at first. It is reported from .42 to .56, with all significance. Second, relation between pupil size to Company A's industry and MBO rank was confirmed by Tukey's multiple comparison. This validity research can enhance pupil size study for vocational preference and practical realization in commercial industry.

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# POLICY ANALYSIS, POLICY-MAKING, AND POLICY REFORM: THEORY AND PRACTICE THE CASE OF ECUADOR IN THE 1980S AND 1990S

James Riordan

## ABSTRACT

*This case study illustrates that the realities of implementing policy analysis, policy-making, and policy reform often differ substantially from what simple textbook propositions would lead one to suppose. It examines – and questions the validity of – common assumptions made by donors in supporting policy analysis, policy-making, and policy reform. The empirical base is USAID's support of agricultural policy analysis, policy-making, and policy reform in Ecuador from the mid 1980s through the mid 1990s, primarily under its Agricultural Sector Reorientation Project. Although the project ended 15 years ago, the common assumptions are still relevant and merit scrutiny.*

**Keywords:** *Policy analysis, policy-making, policy reform, Ecuador, USAID, agriculture, trade, institution-building, technical assistance*

## 1. INTRODUCTION

As openness to free trade gathered momentum throughout the western hemisphere in the late 1980s and early 1990s, Ecuador constituted almost a laboratory setting in which fresh demands for information and analysis surfaced repeatedly to foresee the likely impacts of free trade initiatives, as well as the likely impacts of contentious proposals by trading partners and domestic interest groups opposed to change. During most of the period, the Government of Ecuador – the Ministry of Agriculture, especially – looked to USAID's Agricultural Sector Reorientation Project for much of the information and analysis required to navigate its way through recurrent policy storms. Organizationally, the project supported two entities, the Policy Subsecretariat of the Ministry of Agriculture and the Institute for Agricultural Strategies (IDEA).

In a real sense, the Agricultural Sector Reorientation Project represented the capstone of thirty years of USAID support for agricultural planning, agricultural information, agricultural policy analysis, and agricultural policy reform throughout Latin America and the Caribbean. It is of more than passing interest, therefore, to examine the validity of the assumptions that guided the design and implementation, not only of the project in Ecuador, but of similar projects in the region. This case study asks some basic "philosophical" questions about those assumptions – and suggests some counterintuitive answers.

Among the assumptions that guided the design and execution of many USAID policy analysis activities at the time are the following:

1. Policy reform is an appropriate criterion of success.
2. Policy is made deductively from a master plan.
3. Institutionalization is an appropriate criterion of success.
4. Good technical assistance works itself out of a job.
5. Institution-building means setting up an organization with what it needs to do its job.
6. The buck for agriculture stops at the Ministry of Agriculture.
7. USAID needs big bucks to leverage policy reform.
8. USAID and the host government have the same objectives.
9. The key actors in policy reform appear in organization charts.
10. It is a policy unit's job to convince decision-makers to follow its lead.
11. Policy analysis merits higher priority than data gathering.

## 2. WHAT HAPPENED?

The discussion below summarizes how the assumptions played out in Ecuador.

## 1. Policy reform is an appropriate criterion of success.

Policy reform is presumably a good thing to bring about, but experience in Ecuador suggests at least six reasons it may not be the best touchstone to gauge the success of an agricultural policy analysis activity:

- *Sectoral David vs. macroeconomic Goliath.* Factors outside sectoral decision-makers' control can dampen, if not neutralize, the effect of sectoral policy measures. The fiscal and constitutional crises that Ecuador passed through in 1995 illustrate the point.
- *Attribution of causality.* Often it is problematic to isolate the role that any one actor – or project – plays in a policy decision. More fundamentally, though, does analysis drive reform, or reform drive analysis? In Ecuador, the adoption of price bands did not result from a Minister's dispassionate perusal of a study. Rather, senior management came with a predisposition toward trade liberalization, and they seized on an instrument that analysts already had constructed to move, however tentatively, in that direction. Analysis played a significant role, but, causally, it was the horse of political will that pulled the analysis cart.
- *Political cost.* On learning of policy options available, sometimes decision-makers concluded that the political cost of reform was too dear. But that does not mean analysts had not done their jobs.
- *Avoiding evil vs. doing good.* In an environment in which *la coyuntura* placed policymaking under perpetual siege, preventing bad decisions, though less formally documentable, was at least as important as making good ones. Often the real trick to effective policymaking lay in holding a steady, coherent course.
- *Maintenance of structural reforms.* In reform's aftermath, most pressure for policy change did not come from reformers, but from interest groups intent on recapturing rents. In such cases, the major challenge for policymakers was to resist change, and the appropriate criterion of success was the prevention of backsliding.
- *Timing.* Opportunities for significant reform typically come in narrow windows. The real test, therefore, is how policy activities respond to those opportunities. But policymaking does not conclude then. Reformers need to explain, implement, evaluate, and modify their reforms; new issues arise; pressures mount to subvert reforms; and those in charge can err in implementation. As a result, passage of reform is not the end point, just the beginning.

## 2. Policy is made deductively from a master plan.

Policymaking is not policymaking without a guiding vision – a basic paradigm that gives a sense of direction and sets priorities. Day to day, though, it is much messier than textbooks might lead one to think. As one close to the policy fray in Peru described it:

[S]uccessful agricultural policy is made and maintained one day at a time, not as part of some elaborate and delightfully sophisticated plan but rather through a virtual case-by-case process of responding creatively to perceived problems and of fending off repeated efforts to undermine the desirable portions of policy already in place. Implementable policy analysis . . . requires equal parts of a clear conception of what constitutes an ideal policy, a willingness to take as given certain political constraints, the knack of foreseeing emerging policy crises and policy opportunities, and an ability to identify limited policy changes which would result in improved agricultural performance. (Heckerman, 1985)

Experience in Ecuador illustrates how supposed order and apparent chaos can coexist. At the beginning of the Durán Ballén administration, no one had to convince senior Ministry management to pare down the national marketing parastatal, to eliminate price controls, or to prepare for trade liberalization. Those items were on the agenda from the start. Management needed help not on what, but on how, not anticipating just how much they would have to muddle through from one crisis to the next.

"Muddling through" sounds derogatory, but most policy activities spend most of their time doing just that. Policy is never static. In practice, policy is the accumulation of short-term decisions on a myriad of situational issues: grain prices jump up, importing countries change their banana policy, weather causes declines in production, the exchange rate becomes more overvalued, etc. No matter how heady policy breakthroughs seem initially, it is during the muddling-through phase that reforms take root and become understood, accepted, and implemented -- or become subverted and rendered inconsequential paper tigers. Perseverance is critical.

3. Institutionalization is an appropriate criterion of success.

The Agricultural Sector Reorientation Project worked with three governments – Febres Cordero, Borja, and Durán Ballén – and provided effective support to the first and third. At its conclusion, the Policy Subsecretariat of the Ministry of Agriculture depended financially almost entirely on the project – not exactly a harbinger of organizational permanence.

In the end, institutionalization is not about organizations, but functions. In Ecuador and other countries in the region, USAID and other donors supported agricultural policy units not because they were ends in themselves, but as means to furnish sound information and solid analysis for informed decision-making. Of course, there needs to be an organizational home – or homes – to carry out those functions and improve them over time. But any given organizational home may or may not be permanent – and even if it is permanent, it may be a mansion in one era, and a hut in another. In practice, there are understandable reasons – lack of financing, limitations on public sector salaries, transitory leadership, absence of career-track opportunities, etc. – all significant factors in Ecuador – for apparently effective policy units, especially public sector units, to wither, and even to die.

4. Good technical assistance works itself out of a job.

By conventional wisdom, the best technical assistance passes the baton to local people and works itself out of a job. If one accepts the hypothesis of permanent impermanence in host-country organizational arrangements – and in the individuals involved – maybe that dictum is not so absolute. In an unstable organizational environment, who provides long-term vision, a sense of stability, a commitment to learning, a linkage to the outside professional community? Often by default, that role falls to an outsider.

A good baseball team typically has one player, generally not a star, who is "the glue that holds the team together." Players come and go, star free-agents pop in and out, the team has its ups and downs, but there is a helmsman or helmswoman who helps keep things going, identifies problems and opportunities, and motivates people to perform to the best of their ability. With transitory leadership locally, often that is the most important function that effective technical assistance performs.

5. Institution-building means setting up an organization with what it needs to do its job.

Years ago the conventional approach to organizational development concentrated on providing organizational inputs – office space, equipment, trained people, budget, etc. Evaluations of that approach suggested the advisability of shifting the focus toward meeting organizations' clients' needs. Experience in Ecuador supports the wisdom of that shift of focus from provision of inputs to the delivery of tailored outputs.

The credibility of an organization rides on what it produces. Under the project, both IDEA and the Ministry's Policy Subsecretariat earned their stripes that way. Especially in its early years, IDEA turned out path-breaking analytical work. For its part, the Policy Subsecretariat produced crop monitoring reports every month and crop situation and output reports every six months. It also prepared occasional policy memoranda on issues of immediate interest.

In retrospect, the Subsecretariat's decision, first, to produce periodic reports and, second, to hold individuals accountable for them was one of the most far-reaching under the project. Not only did the reports demonstrate to senior Ministry management and the public that the unit was producing something of use; it also motivated the members of the unit themselves.

#### 6. The buck for agriculture stops at the Ministry of Agriculture.

Policies established outside the Ministry of Agriculture have a tremendous effect on agriculture. When the Durán Ballén government took office, it moved to correct the overvaluation of the sucre, not as an agricultural policy, but to benefit the entire economy. During the project's last four years, the overvaluation of the sucre – on the order of 20 percent – did hurt agriculture. Still, inflation came down, the balance of payments became manageable, labor problems were minimal, and economic growth took place, even in agriculture. Overall, the policy framework was not bad enough to prompt macroeconomic decision-makers to make corrections to benefit one sector.

For its part, a Ministry of Agriculture can establish sectoral policies to mitigate the impact of negative macroeconomic policies. In Ecuador, the Policy Subsecretariat used the price band mechanism to compensate for the effects of overvaluation. As long as the macroeconomic framework does not get wildly out of hand, such sectoral measures can work.

#### 7. USAID needs big bucks to leverage policy reform.

The argument that one needs big pockets to leverage policy reform rests on the premise that one party does not want to do what the other wants and, thus, the only way to bring about policy change is to buy it. Such a conception of the policy reform process does injustice to the maturity one observes today in most countries in Latin America and the Caribbean. Whatever policy reform took place during the project in Ecuador came because the government wanted it, not because a donor was buying it. Still, that does not mean Ecuador could ignore the rest of the world. To join GATT/WTO, an accomplishment during the project, it had to toe the line on a number of measures it would not have contemplated otherwise. Overall, as an evaluation of a policy education project in the Dominican Republic put it, "In the final analysis, the Dominican Republic, like other countries in the hemisphere, will make difficult policy reforms that will stick only if it believes in them. In other words, the battlefield at issue here is not one of money; it is one of ideas." (Riordan, 1996)

#### 8. USAID and the host government have the same objectives.

As a rule, USAID and host governments agree on objectives, but at a level of generality that threatens no one. Who can argue with "strengthening and improving" policy, information, whatever? On specific ends and means, however, rarely is there complete coincidence.

More often than not, USAID begins with a fairly clear master plan for reform – what issues are important, what studies to conduct, what laws to draft, etc. Host government decision-makers, in contrast, generally have less well defined reform agendas. They know where they want to go, but zigzag to get there. Within limits, priorities, timing, and specific measures are up for grabs. The USAID approach is clean, systematic, and deductive, while their counterparts' approach is messy, eclectic, opportunistic, and inductive.

#### 9. The key actors in policy reform appear in organization charts.

In Ecuador, Ministers and some Subsecretaries played important roles. But certain individuals – by dint of their personalities or political connections – often exerted influence out of proportion to their official

positions. The real power structure differed from the paper power structure. And some key players did not appear in official organization charts at all:

- *International organizations.* The Andean Pact had much to do with the Andean free trade zone, the common external tariff, and the price band.
- *Private sector.* The government took no major decisions affecting sensitive commodities without consulting relevant producer associations, agro-industry groups, and important exporters.
- *Other Ministries.* Other Ministries were very important. The GATT/WTO negotiations involved the Vice Presidency, the Ministry of Industry and Commerce, and the Ministry of Foreign Relations.

10. It is a policy unit's job to convince decision-makers to follow its lead.

In Ecuador, the relationships between decision-makers and their analytical units varied considerably. Some decision-makers came to the job with very clear ideas, and they expected their staffs to march in lockstep with them. Others looked to their staffs for assistance in defining the policy agenda in detail. In both cases, the interactions between the two typically were much more subtle than what first met the eye.

Sometimes the mere provision of information was sufficient to influence decisions. A member of the Policy Subsecretariat ran into a producer in Guayaquil who complained that the import of X would ruin the sector. Data showing that annual imports represented less than one percent of national production quelled the concern. In Ecuador, a high proportion of the policy analysis work conducted in the Ministry of Agriculture had to do with clarifying issues with data and information. The Ministry expended considerable energy in preparing and negotiating the entry of the agricultural sector into GATT/WTO. The task did not involve weighing the pros and cons of entry nor the advocacy of any particular position, but simply becoming knowledgeable about external markets, other country policies, and the terms of existing agreements.

11. Policy analysis merits higher priority than data gathering.

In the 1980s and 1990s, USAID's Agricultural Policy Analysis Project conducted several reviews of agricultural policy activities worldwide. Among other things, it found that most activities focused on information systems had little policy impact. It therefore urged future activities to give higher priority to analytical work than to data gathering.

The Agricultural Sector Reorientation Project made statistical data gathering and reporting high priority. Policy analysts used the data heavily. Oftentimes, in fact, the data were the analysis. What made experience in Ecuador different from the norm?

In the late 1980s, no one in the Ministry of Agriculture consolidated basic sectoral information and kept it reasonably current. Willy-nilly, therefore, by collecting and organizing consistent and up-to-date information and data on issues of importance, the Policy Subsecretariat not only filled a huge void but wound up as the monopoly supplier of a product both Ministry decision-makers and private sector groups found useful and wanted more of. In a working environment where much had been guesswork up until then, the work supported by the project met a real need – a need that often the basic information itself – without elaborate analysis – satisfied well. As time went on, new demands led to improvements in data quality and coverage. Like topsy, the whole enterprise grew – a demand-driven snowball.

In brief, what did the project do differently from activities elsewhere that had focused on information and failed to have policy impact? Three things:

- *Focus on client needs.* Many donor projects at the time developed information systems independently of policy analysis needs. More than anything else, decision-makers in Ecuador

needed basic data on prices, production, stocks, imports, exports, the exchange rate, and deflators. There, such relatively simple data, well organized and up-to-date, went a long way toward addressing most issues of interest.

- *Government priorities.* The project collected the information and data that met the needs, first, of agricultural policymakers and, only secondarily, of donors.
- *KISS – keep it sweet and simple.* At the time, statistical activities financed by donors often were overly complex, too large, and too high tech for existing human resource and logistical support capacity. The project set out to accomplish, not the ideal, but the doable.

### **3. CONCLUSION.**

2012 is a decade and a half removed from the Agricultural Sector Reorientation Project in Ecuador, but the lessons learned from that experience – many of which flew in the face of conventional wisdom at the time – appear as applicable today as then. In most countries of the hemisphere, the function of policy analysis continues, and, day to day, its muddling-through character as well.

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# FRAUD, INTERNAL CONTROL, ROLE OF CPA, AND AUDIT COMMITTEE

Nashwa George

## ABSTRACT

*As fraud becomes the crime of the 21<sup>st</sup> century, it is more critical than ever to learn more about fraud. Developing and sharpening the skills and techniques necessary to prevent and detect fraud has become very important for management, auditors, and audit committees. This paper examines fraud. Motivations of fraud, signs of fraud, and preventing and detecting fraud. Also, it examines the role of auditors in finding fraud, the impact of Sarbanes-Oxley Act on fraud, and the role of audit committee.*

## 1. INTRODUCTION

With the highly visible corporate fraud scandals in recent years, fighting fraud is a challenge for management, auditors, boards of directors, and all of us. Fraud is a serious, costly, and growing problem for business and government. It is more cost-effective to prevent fraud than to punish it. Fraud is an extremely costly business problem. According to a survey done by The Association of Certified Fraud Examiners, businesses lose over \$600 billion a year to fraud and abuse. However, only 20% is discovered. For example, a Fortune 500 Company recently had a \$436 million loss because of fraud. Preventing and detecting fraud is a business problem for every organization. As fraud becomes the crime of the 21<sup>st</sup> century, it is more critical than ever to learn more about fraud. Developing and sharpening the skills and techniques necessary to prevent and detect fraud has become very important for management, auditors, and audit committees.

## 2. PURPOSE OF THIS STUDY

The purpose of this study is to answer the following questions:

What is fraud? Why do people commit fraud? What are the motivations? What are the signs or red flags? How to prevent and detect fraud? What are the role of auditor and audit committee?

### What is Fraud?

Webster's Dictionary defines fraud as "an instance or act of trickery or deceit especially when involving misrepresentation; an intentional misrepresentation, concealment, or nondisclosure for the purpose of inducing another in reliance upon it to part with some valuable thing belonging to him or to surrender a legal right." The Federal Bureau of Justice Statistics defines white-collar crime as "nonviolent crime for financial gain committed by means of deception by persons whose occupational status is professional or technical." The American Heritage Dictionary defines fraud as "a deception deliberately practiced in order to secure unfair or unlawful gain." Black's Law Dictionary defines fraud as "the knowing misrepresentation of the truth or concealment of a material fact to induce another to act to his or her detriment and a misrepresentation made recklessly without belief in its truth to induce another to act."

### Why do people commit fraud?

Dr. Donald Cressey a pioneer in fraud research developed the fraud triangle theory to explain why people commit fraud. Fraud triangle has three interrelated elements: opportunity, motive, and rationalization.

The absence of any one of them would not allow a person to commit a fraud. (a) Opportunity: The circumstance that gives a person opportunity to commit fraud. This depends on a person's position in a corporation, (b) Motive: there are many motivations to commit fraud, and (c) Rationalization: a person justifies his inappropriate actions. The fraudster is convinced that what occurred is not bad or wrong.

### **What are the motivations?**

The most common motivations to commit fraud are:

- 1) No employer loyalty. Loyalty means that people feel a sense of belonging and responsibility for ensuring that things are done properly and corporate resources and interests are protected. Loyalty is under great pressure because of social and demographic trends. The relation between employer and employee has an economic aspect but no social or mutual bonding or trust and honor.
- 2) Work pressure and incentive to drive the company's stock price up. The pressure to get work done at specific required quality and on time will lead to many problems and issues. Employees are motivated to change the financial results of operations to meet their boss's expectation, especially if employees' compensations and bonuses are related to these results and/or to the company's stock price. In addition, employees have stressful activities and no time to attend classes or conferences to learn about preventing and detecting fraud when there are no rewards for attending these classes or conferences.
- 3) Financial crises and economic depression. When employers face personal financial crises and need financial support, some of them might commit fraud by using company resources to support themselves.

### **What are the red flags or signs of fraud?**

These red flags are only symptoms but they are not proof of fraud.

- 1) Big changes in a person's lifestyle without a giving reason.
- 2) One acts suspiciously and has unusual behaviors at work
- 3) Tips and complaints from employees, customers, and suppliers..
- 4) Missing some documents and the books are not balanced.
- 5) Weak internal control system and inappropriate "tone at the top".

### **How to Prevent and Detect Fraud**

Prevention and deterrence of fraud consists of those actions taken to discourage the perpetration of fraud and to limit exposure if fraud occurs. Fraud is detected through controls, by accident, by tip-offs, by auditors, and by a good program of detection. Management holds primary responsibility for preventing and detecting fraud. External auditors have a secondary responsibility for fraud that impacts financial statements. Management and the board of directors should establish and maintain a control system that includes policies and procedures to prevent and detect fraud. The internal auditor is responsible for helping deter fraud by examining and evaluating the effectiveness of the control system. The CPA should design a program for detecting fraud. It is important that the auditor notices the circumstances' or events' "symptoms" that could be attributed to fraud and initiates audit procedures if the circumstances were indicative of fraud. Symptoms of fraud include, but are not limited to, complaints from recipients of defective goods or services; unexplained differences between planned and actual costs; and dramatic improvements in an employee's lifestyle.

Besides searching for evidence of fraud, it is important to evaluate periodically operational systems that may be at risk of fraud. Risk assessment is a useful tool to assist fraud detection routines. When developing a fraud detection program, a company must know that many kinds of fraud have accounting implications. Either accounting records have been changed or omitted to hide the fraud or the records provide reliable evidence of the fraud.

The way a company compiles and stores documents and information may well have a bearing on the feasibility of fraud detection. It is very important to publicize in an aggressive way the approach to detection because it may act as a deterrent for those who sit on the border between right and wrong behavior. However, there are some types of fraud that are very hard to detect by any method.

### **3. FRAUD IN FINANCIAL STATEMENTS AND ROLE OF AUDITORS**

In 1978, the Cohen Committee report stated that “independent auditors have always acknowledged some responsibility to consider the existence of fraud in financial statements.” In most cases, financial statement fraud occurs because of pressure on upper management to meet earnings expectations. Although a company might follow generally accepted accounting principles (GAAP) in preparing its financial statements, there is more than one interpretation and method that can be used under GAAP. Fraudulent statements are used to increase the apparent prosperity of the organization in the eyes of current and potential investors. In addition, employees might be tempted to manipulate statements if their compensations are related to the results of operations.

The auditing standards require the auditor conducting an audit to assess the risk that errors or irregularities may cause the financial statements to contain a material misstatement. Nevertheless, the nature and extent of that responsibility is not clear. For example, the Statement on Auditing Standards No. 82, Consideration of Fraud in a Financial Statement Audit, states that “although fraud is a broad legal concept, the auditor’s interest specifically relates to fraudulent acts that cause a material misstatement of financial statements.” In addition, Statement No. 82 states that an auditor “has a responsibility to plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatements, whether caused by error or fraud.” The Statement indicates that fraud frequently involves a pressure or incentive to commit fraud and a perceived opportunity to do so. The Statement divides the fraud risk factors into: 1) management’s characteristics and influence over the control environment, 2) industry conditions, and 3) operating characteristics and financial stability. Both internal and external auditors should be responsible for preventing and detecting fraud. Normally, an audit performed in accordance with generally accepted auditing procedures does not include audit procedures specifically designed to detect illegal acts. The ordinary examination incident to the issuance of an opinion respecting financial statements is not designed and cannot be relied upon to disclose defalcations and irregularities. External auditors basically do not search to discover fraud in financial statement balances but rather, they search for it indirectly. When external auditors (CPAs) discover fraud, it is accidental, or incidental to their not being able to verify a reported financial balance. When auditors detect material problems and corporate management refuses to take action, the CPA firm withdraws from the assignment and the job passes to another CPA firm.

In October 2002, the Auditing Standard Board issued its statement No. 99, Consideration of Fraud in a Financial Statement Audit, which contains a guide to help management prevent, deter, and detect fraud. This is considered an important step that challenges corporate management to be a partner with auditors in creating an environment of antifraud programs.

Although an internal controls system is designed to ensure that accounting records are accurate, it does not help in detecting or preventing fraud. Internal auditors work for management, but they have the responsibility of ensuring that information is accurate, resources are protected, and compliance with standards, legislations, and regulations is achieved. Implicit within these objectives is the prevention and detention of fraud. However, the real safeguard against fraud is the system of managerial and financial controls that should be in place in response to an assessment of the risk of fraud.

### **4. FRAUD AND ETHICS**

Fraud occurs due to unethical behavior of employees (including executives). What constitutes ethical behavior must be known by all employees. Employers should specify those behavioral actions that are considered unethical and should create standards of conduct that are signed by all employees, indicating that employees have read and understood these standards. Standards of conduct should state the kind of gratuities that may be accepted from a company doing business with the employer. The standards of conduct should make it clear to employees that violations will subject them to disciplinary action and possibly prosecution.

## **Ethics and Values**

Ethics should really be about corporate consciousness and involve a degree of guidance on how to put ethic codes into action. Values have more to do with the way people are expected to behave toward others. Values are broader in scope and linked to what each organization wants its customers, employees, and other related parties to get from the relationship. In addition, ethics, values, and religion are related. Employees' religious backgrounds impact their values and their ethics. An employee's religion informs his/her view of good and bad, right and wrong, and ultimately, leads or guides his/her behavior. It should be clear for all employees that right or wrong are not in terms of personal gain only but for the company as well as the entire society.

## **Fraud and the Sarbanes-Oxley Act of 2002**

Section 404 of the Sarbanes-Oxley Act requires that public companies include in their annual reports a report of management on the company's internal control over financial reporting. This report must include a statement of management's responsibility for establishing and maintaining adequate internal control over financial reporting for the company's most recent fiscal year; a statement identifying the framework used by management to evaluate the effectiveness of the company's internal control over financial reporting; and a statement that the registered public accounting firm that audited the company's financial statements included in the annual report has issued an attestation report on management's assessment of the company's internal control over financial reporting.

Although the Sarbanes-Oxley Act does not contain procedures for preventing and detecting fraud, it emphasizes the importance of the internal control system. A strong internal control system that is the responsibility of both corporate management and public accounting firms is the key to preventing and detecting fraud.

Companies have responsibility to improve their basic internal controls, such as making enhancements to reconciliations, creating greater segregation of duties, and making digital data more secure. Internal auditors have a bigger role in terms of auditing a company's risks and controls and add more value to the companies.

## **Fraud and Audit Committee**

Because of increase the risk of fraud in many organizations, the role of audit committee has dramatically elevated. Audit committee plays an important role in overseeing investigations into alleged or suspected fraud. Audit committee should have a good program to prevent, detect, and mitigate fraud. Audit committee has responsibility to evaluate management's process for the identification and mitigation of fraud risk and reinforcing a zero-tolerance policy for fraud. The committee should provide oversight over internal control system and evaluate the process, procedures, and documentation of financial reporting. In addition, the committee should establish a system for employees and others to report any concern about fraud or unethical behavior, i.e., a whistleblower system with details for the way of reporting to the committee. In doing these activities, audit committee should seek help from legal counsel, internal auditors, and external auditors.

Any antifraud program must be designed to address the audit committee's and company's needs and objectives-one size does not fit all. In overseeing effective antifraud programs, many audit committees use the following resources: Committee of Sponsoring Organizations (COSO) of the Treadway Commission's Internal Control Framework; New York Stock Exchange (NYSE) and NASDAQ corporate governance listing standard requirements; and American Institute of Certified Public Accountant's (AICPA's) Guidance on Anti-Fraud Programs and Controls.

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## LIBERATING PEOPLE FROM BOTTOM OF THE PYRAMID (BOP) IN INDIAN SCENARIO

Prakash Shukla

### ABSTRACT

*The world is moving towards a new age of economics and a 'holistic globalisation', wherein dynamics interplay of many force multipliers are taking place. The problem of global poverty is well-known, which is ubiquitous and enduring. Although sustained economic growth in countries like India and China has brought down the overall poverty level, we are still far from achieving desired results as per UN's top Millennium Development Goal of halving the number of people living in extreme poverty by 2015. The poor, who represent 80% of humanity, are eager to reap the benefits of globalization: high quality products and services at affordable cost as well as access to global markets. Also, today, people are not constrained by ignorance but are well connected- through TV, radio, cell phones, and PCs and with the global village concept as is well known anecdote: 'That world is becoming flatter'. As per Prahalad's book (2007), "The Fortune at the Bottom of the Pyramid", the major strength lies at the poorest segment of the Society. And, the various force of market, technology, spirituality and force of human capital are the dominant factors of force multipliers. It is not important to concentrate on 'tangible assets', but to harness 'intangible assets' synergistically and integrate for betterment of mankind. And, it is a herculean and challenging task. In fact, the dire need of hour is about thinking about BOP (Bottom of the Pyramid), unleashing their brain-power and pushing the poor segment of society upward. Government of India has launched many schemes/ programmes for the poverty alleviation measures. Liberating people from BOP will be most satisfying tasks for all of us towards the end of the day.*

### 1. INTRODUCTION

The world is moving towards a new age of 'holistic globalization' wherein dynamic , interplay of force multipliers are taking place to alleviate poverty all over world's 4 billion poor people. The TV, news papers and economic magazines are replete with the dire need of poor people. There are 86% of world's population spanning across the 150 nations have a per capita gross national product (GNP) of less than \$10,000. Poverty is widespread in India, as well, with the nation- estimated to have a third of the world's poor. South Africa, Latin America and others in Asian countries also have considerable poor population and the problem arising out of that.

Poverty can be defined as: "a condition in which person fails to maintain their desired standard of living. Poverty further defines the norms/basis of money required to buy food worth 2100 calories in urban area and 2400 calories in rural areas".

Alleviation of poverty remains a major challenge before the Government. As per Prahalad's (2007), the famous work, "Bottom of the Pyramid", the major strength of India lies at the 'Bottom of the Pyramid (BOP)'- the poorest segment. Though, the poverty since 1973-74 is steadily declining, but still employment- intensive measures, primarily has to be focused and their strategic essential, needs are to be fulfilled. India's anti-poverty strategy for urban and rural areas has three broad strands: promotion of economic growth; human development & targeted programmes to address the multi dimensional nature of poverty.

This is more a challenging task for all of us to promote 80% of people at BOP, which are mostly enjoyed wealth by 20% top bracket as per famous Pareto Law. How to mobilize this HR resources, scale and scope of large firms for co-creating solutions to this complex problems of lower rung people is the major concern all over the world and especially for us in India. NGOs, private sectors, public sectors and many non-orthodox organizations can take up this challenge. A unique co-creation of values has to be formed for seeking unique solutions to many such connected problems. Though, the Government of India has sponsored 51 poverty alleviation schemes with budgeted expenditure about Rs.72,000 crores in 2006-07 to rural poor (Aswale,2011; Nayyar,2011; Wikipedia.org). Several

studies on the subject reveal failure of such programmes like mainly Indira Awas Yojna (IAY), Swarnajayanti Gram Swarajgar Yojna (SGSY), Integrated Rural Development Programs (URDP), Drought Prone Area Programs (DPAP), etc. to mention few of them.

The conventional approach and traditional analysis of society has been more central to market and state approach to problems, issues & policy making of the society. This horizontal movement and axis view point ignores the vertical axis capitalization of spiritually knowledge economy and working culture with passion. In fact, the need of hour is about thinking passionately about BOP, revolutionizing the approach and making spiritual actualization as well as harnessing 'intangible assets' for the uplift of poor masses with Indian ethos, pathos and logos.

Herein, the four fundamental force multipliers are to be taken into considerations. These are: force of market; force of technology; force of spirituality and force of human capital requires to be leveraged. Apart from Government policies and their various programmes the participation of all populace will be dire essential in this marathon endeavour. Murthy (2009), Nandan Nilekani (2008), Engardio (2007), Rai (2008), Kasturi Rangan etal. (2007) and many other lead economists corroborate the same idea and have suggested suitable & functional solutions for the poor segment of the society.

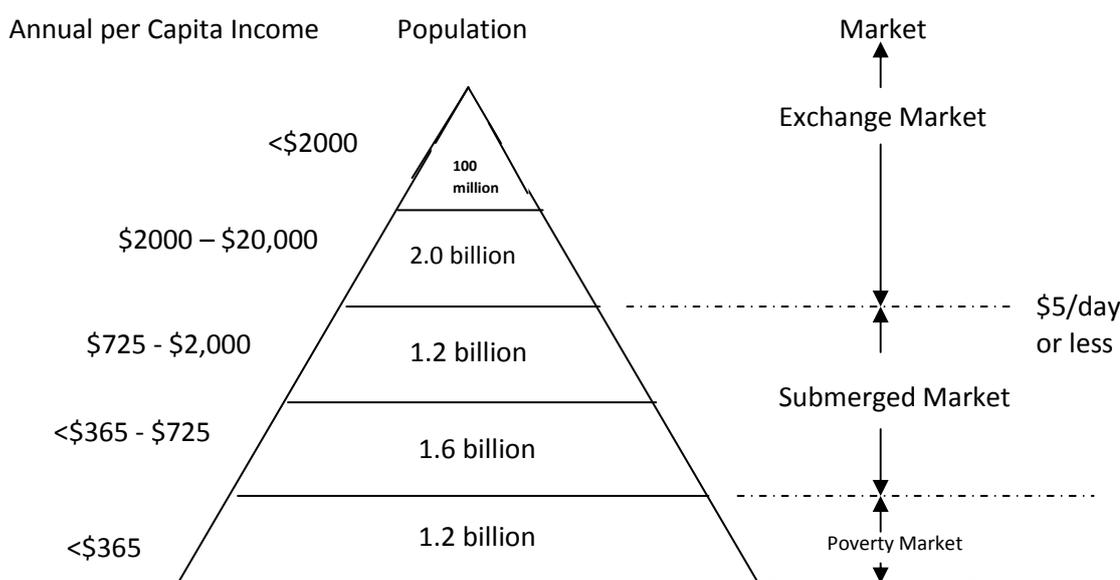
In my opinion to solve the problem of poor and eradicate the contagious phenomenon of poverty obtaining in India and elsewhere, one has to focus on three fundamental problems cited as under:

- Educational growth to the poor section of the society.
- Employment - the much needed essential requirement, and
- Healthcare programmes of the lower rung of people.

Few case studies also have been, included in the paper and suitably presented for understanding the practical problems of poor section of the society.

## 2. GLOBAL ECONOMIC PERSPECTIVE

It hardly needs to be emphasized that the poor represent a vast majority of market; as of 2006, nearly 4 billion people lived on less than \$5 a day which is extremely heterogenous mixture. At the same time Latin America (Argentina, Brazil, Chile, Colombia, Costa Rica and Mexico.) – these are home to 71% of the region's population and encompass 81% of the region's G.D.P.



**Fig.1: Global Income Pyramid**  
(Source: World Bank (2001a); Prahalad (2002))

Infact, Fig.1, represents an extremely heterogenous variety of sub-groups that differ by socio-economic status, culture, and gender. Herein, we find that the true 'rock bottom' group is the 'poverty market', where most people lack the basic necessities of life: sufficient food, clear water, and adequate shelter. In contract, the individuals of the 'submerged markets; are between income group of \$1 and \$ 5 per day are better placed than 'extreme poverty market group' but may not have bank accounts or formal credit but may get loans from money lenders. The top bracket of the pyramid is wealthy, with numerous opportunities for generating high income. We are concerned with mostly the 4 billion people at the bottom (BOP), in this paper.

### 3. X-RAY METRICS OF THE INDIAN POPULATION

Poverty is widespread in India, with the nation estimated to have a third of the world's poor. However, this also represents a significant decline in poverty from the 60% in 1981 to 42% in 2005(Aswale, 2011; Wikipedia, 2011) Table 1 and Fig.2 (graph) shows this trend.

Table 1: Estimates of Incidence of Poverty in India

Year	All India		Rural		Urban	
	Number (million)	Poverty ratio (%)	Number (million)	Poverty ratio (%)	Number (million)	Poverty ratio (%)
1973-74	321	54.9	261	56.4	60	49.0
1977-78	329	51.3	264	53.1	65	45.2
1983	323	44.5	252	45.7	71	40.8
1987-88	307	38.9	232	39.1	75	38.2
1993-94	320	36.0	244	37.3	76	32.4
1999-2000	260	26.1	193	27.1	67	23.6

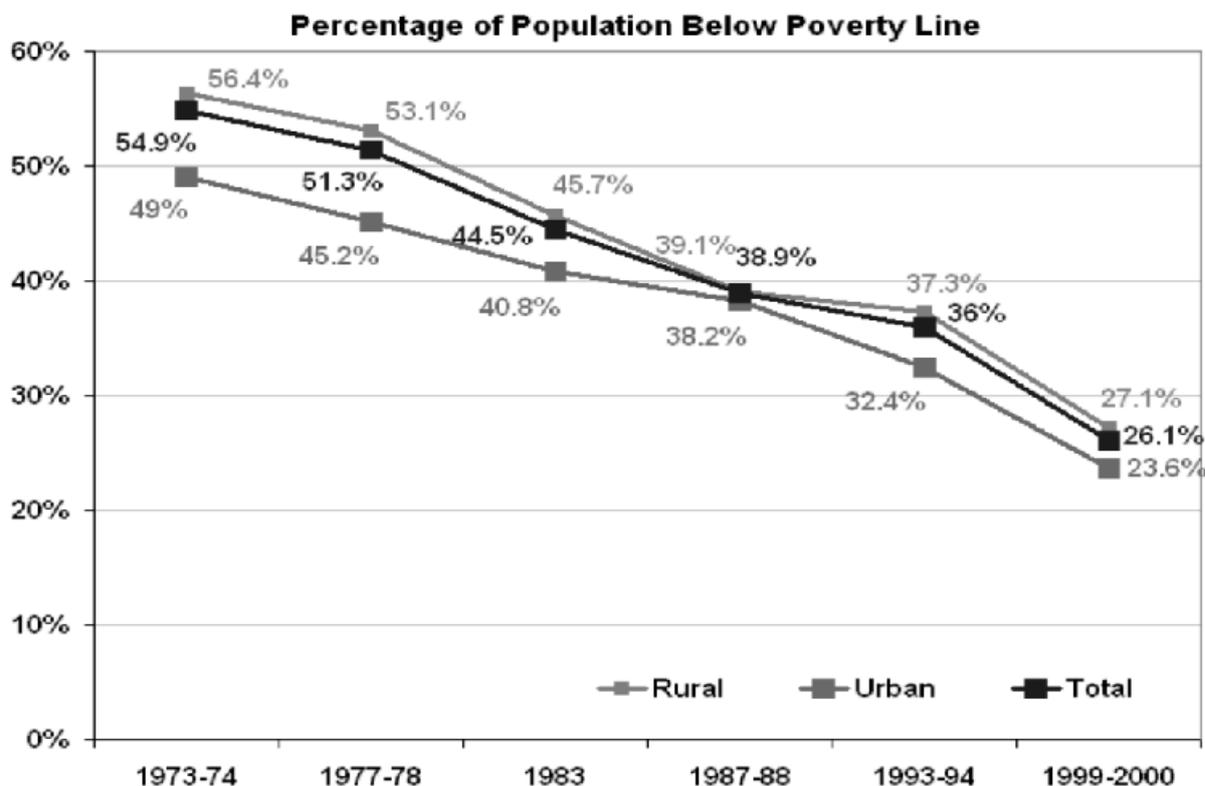


Fig.2: Percentage of Population below Poverty Line

According to the latest NCAER (National Council of Applied Economic Research), show that in 2009, only 15.6% of the households or 200 million people, had income less than Rs.45,000 annually(US \$1.4 PPP- Purchasing Power Party- per person). On the other hand, the Planning Commission of India uses its own criteria and has estimated that 27% of the population was living below the poverty line in 2004-2005, down from 51.3% in 1977-78 and 36% in 1993-94.(refer Table 1).

A study by the Oxford Poverty and Human Development Initiative using a MPI (Multi-dimensional Poverty Index) found that there were 645 million poor living under the MPI in India. 421 million of whom are concentrated in Bihar, Chattisgarh, Jharkhand, Madhya Pradesh, Orissa, Rajasthan, Uttar Pradesh and West Bengal. This number is higher than the 410 million poor living in 26 poorest African nations. Nandan Nilekani of ex-INFOSYS (2008) gives a synonym of above states as BIMARU (Bihar, Madhya Pradesh, Assam, Rajasthan & Uttar Pradesh).Government specified poverty threshold of 12 Rs/day (US\$0.25) is very ludicrous. Official figures estimate that 27.5% of Indians lived below the natural poverty line in 2004-2005. A 2007 report states that 77% of Indians or 836 million people lived on less than 20 Rs/day. India is trying hard and is on the track of reduction of poverty goals. Effect of worldwide recession during 2009, have plunged 100 million more Indians into poverty than these were in 2004, increasing the effective poverty rate from 27.5% to 37.2% (Majumdar etal; 2010). By 2015, an estimated 53 million people will still live in extreme poverty and 23.6% of the population will be under US\$1.25 per day. This number is expected to reduce to 20.3% or 268 million people by 2020.

#### 4. CAUSES OF POVERTY

There is a very long list, but some main causes of poverty in India are:

- **Caste system:** 'Dalits' are considered around 65% of rural caste as poor, are below poverty line. Dalits constitute the bulk of poor and unemployed
- **British Raj:** The Mughal era ended at about 1760. Jawaharlal Nehru claimed that, longer rule under British made India poorer. The Indian economy was purposely and severely deindustrialized, especially in the areas of textiles and metal-working, through colonial privatizations, regulations, tariffs on manufactured or refined Indian goods, taxes, and direct seizures.
- **India's Economic Policies:** There is a surplus of labour in agriculture. Farmers are a large vote bank and use their votes to resist reallocation of land for higher-income industrial projects. While services and industry have grown at double digit figures, agriculture growth rate has dropped from 4.8% to 2%. About 60% of the population depends on agriculture whereas the contribution of agriculture to the GDP is about 18% .Thus, Over-reliance on agriculture and high population growth rate, is also a cause of poverty.
- **Liberalization Policies of 1990s:** Though there are some apparent gains of liberalization, like increase in cash crops, transparency in dollar- rupee scenario but this is also responsible for collapse of rural economies, agrarian crisis and suicides of farmers. Some of the main points are:
  - Unequal Distribution System of subsidies and other facilities to poor section of society.
  - Over-reliance on agriculture.

#### Circulation of Black (Hidden) Money

Presence of massive parallel economy in the form of black (hidden) money stashed in overseas tax havens and under utilization of foreign aid have also contributed to the slow pace of poverty alleviation in India.(The Hindu, Chennai, 18 March 2011).

#### 5. STRATEGIC MEASURES FOR POVERTY ALLEVIATION BY GOVERNMENT OF INDIA

Government of India has launched various programmes & schemes for poor segment right from independence, 1947.Some of the major programmes are enumerated below which also cover self-employment programmes.

### **Swarnjayanti Gram Swarozgar Yojana (SGSY)**

The single self-employment program of Swarnjayanti Gram Swarozgar Yojana (SGSY), launched with effect from 1.4.1999, has been conceived keeping in view the strengths and weaknesses of the earlier schemes of Integrated Rural Development Program (IRDP) and Allied Programs along with Million Wells Scheme (MWS). The objective of restructuring was to make the program more effective in providing sustainable incomes through micro enterprises. The SGSY lays emphasis on the following:

- Focused approach to poverty alleviation.
- Capitalizing advantages of group lending.
- Overcoming the problems associated with multiplicity of programs.

### **Jawahar Gram Samridhi Yojana (JGSY)**

The Jawahar Rozgar Yojana (JRY) has been recast as the Jawahar Gram Samridhi Yojana (JGSY) with effect from 1.4.1999 to impart a thrust to creation of rural infrastructure. While the JRY resulted in creation of durable assets, the overriding priority of the program was the creation of wage employment. It was felt that a stage had come when rural infrastructure needed to be taken up in a planned manner and given priority. The Gram Panchayats can effectively determine their infrastructure needs and the responsibility of implementing the program has been entrusted to the Gram Panchayats. The funds are directly released to the Gram Panchayats by the DRDAs/Zilla Parishads. The JGSY is implemented as a CSS with funding in the ratio of 75:25 between the Centre and the States.

- The primary objective of JGSY is creation of demand driven community village infrastructure including durable assets at the village level and assets to enable the rural poor to increase the opportunities for sustained employment.
- The secondary objective is generation of supplementary employment for the unemployed poor in the rural areas. The wage employment under the program is given to Below Poverty Lines (BPL) families.

### **Employment Assurance Scheme (EAS)**

The Employment Assurance Scheme (EAS) was launched on 2nd October, 1993 in 1772 identified backward blocks of 257 districts situated in drought prone, desert and tribal and hill areas where the Revamped Public Distribution System (RPDS) was in operation. The program was subsequently extended to more blocks and thereafter was universalized. It is, presently, being implemented in all the 5448 rural blocks of the country. The EAS was restructured w.e.f. 1999-2000 to make it the single wage employment program.

- The primary objective of the EAS is creation of additional wage employment opportunities during the period of acute shortage of wage employment through manual work for the rural poor living below the poverty line.
- The secondary objective is the creation of durable community, social and economic assets for sustained employment and development. EAS is open to all the needy rural poor living below the poverty line. A maximum of two adults per family are provided wage employment. While providing employment, preference is given to SCs/STs and parents of child labor withdrawn from hazardous occupations who are below the poverty line.

### **National Social Assistance Program (NSAP)**

The NSAP was launched with effect from 15th August, 1995 as a 100 per cent Centrally Sponsored Scheme with the aim to provide social assistance benefit to poor households in the case of old age, death of primary breadwinner and maternity. The three components of the NSAP are:

- (i) National Old Age Pension Scheme (NOAPS),
- (ii) National Family Benefit Scheme (NFBS) and
- (iii) National Maternity Benefit Scheme (NMBS).

### **Annapurna Scheme**

In 1999-2000, the Government had announced the launching of a new scheme 'Annapurna' to provide food security to those indigent senior citizens who are not covered under the Targeted Public Distribution System (TPDS) and who have no income of their own and none to take care of them in

the village. 'Annapurna' will provide 10 kg. of food grains per month free of cost to all such persons who are eligible for old age pensions but are presently not receiving it and whose children are not residing in the same village.

### **DRDA Administration**

The District Rural Development Agencies (DRDAs) have traditionally been the principal organ at the district level to oversee the implementation of different anti-poverty programs. Under the program, the DRDAs have been conceived to emerge as a specialized agency for managing the anti-poverty programs of the Ministry of Rural Development aiming towards poverty eradication in the district. While the actual execution of the various programs lies outside the purview of the DRDAs, its role is to facilitate the implementation of the programs, to supervise/oversee and monitor the progress, receive and send progress reports and account for the funds. The DRDAs are also entrusted the task of developing the capacity to build synergies among different agencies involved to bring about effective results.

### **Rural Housing – Indira Awaas Yojana (IAY)**

In the Ninth Plan, the Special Action Plan for Social Infrastructure has identified 'Housing' as one of the priority areas. It aims at providing 'Housing for All' and facilitates construction of 20 lakh additional dwelling units, of which 13 lakh dwelling units are to be constructed in rural areas. The Indira Awaas Yojana (IAY) will continue to be major scheme for construction of houses to be given to the poor, free of cost. Equity support by the Ministry of Rural Development (MORD) to Housing and Urban Development Corporation (HUDCO) has been increased to improve the outreach of housing finance in rural areas. In addition, an Innovative Scheme for Rural Housing and Habitat Development and Rural Building Centers (RBCs) has been introduced to encourage innovative, cost effective and environment friendly solutions in building/housing sectors in rural areas. A National Mission for Rural Housing and Habitat has been set up to address the critical issues of 'housing gap' and induction of science and technology inputs into the housing/construction sector in rural areas.

### **Drought Prone Area Program (DPAP)**

DPAP aims at to minimize the adverse effects of drought on production of crops and livestock and productivity of land, water and human resources ultimately leading to the drought proofing of the affected areas. It also aims at promoting overall economic development and improving the socio-economic conditions of the resource poor and disadvantaged sections inhabiting the program areas. The DPAP is in operation in 947 Blocks of 161 districts in 13 States.

### **Integrated Wastelands Development Program (IWDP)**

IWDP has been under implementation since 1989-90 wherein wastelands are being developed with the active participation of stakeholders i.e. user groups, self help groups and PRIs. Here, the projects are sanctioned in favour of DRDAs/ZPs (Zila Parishad) for the period of five years. The projects are implemented through the Project Implementing Agencies (PIAs) which can be a Line Department or a reputed NGO having sufficient experience in the field of watershed development. The program is implemented all over the country.

### **Pradhan Mantri Gramodaya Yojana (PMGY)**

Pradhan Mantri Gramodaya Yojana (PMGY) was launched in the Annual Plan 2000-2001 in all the States and the UTs in order to achieve the objective of sustainable human development at the village level. It envisages allocation of Additional Central Assistance (ACA) to the States and UTs for selected basic minimum services in order to focus on certain priority areas. The programs under PMGY include Primary Health, Primary Education, Rural Shelter, Rural Drinking Water, Rural Electrification and Nutrition.

## **6. KNOWN PROBLEMS & KNOWN (UNIQUE) SOLUTIONS- MISSING LINK**

Orchestrating a better prosperity and life style to villagers, poor farmers in and around rural as well as urban areas, and improving their knowledge through internet, innovative techniques, rapid-low-cost

dissemination had been the main agenda of the various tireless efforts taken by public, private and NGOs sectors. Herein, two case- studies have been taken: e-chaupal, ITC Venture; and 'Aravind Eye Hospital'. Taking more cases becomes more voluminous a case to be included in this paper. The cases are cited as under:

- ITC-e-Choupal
- Aravind Eye Hospital

### **Case Study: 1 Aravind Eye Care System - Vision 2020**

Aravind Eye Care System (AECS, Aravind), Madurai, Tamil Nadu, India, is a hugely successful set of related, vertically integrated organizations that provides Eye Care to several hundreds of thousands of people each year. It is now a global benchmark organization in the field of eye care, in terms of quality of treatment, volumes handled, productivity of its workforce, caring environment for its stakeholders (patients, employees, etc.), and most importantly for bringing corporate social responsibility to the centre-stage of its working. The organization owes its existence to one individual, Dr. Govindappa Venkataswamy (Dr. V)Padmashree, its founder started in 1976, who despite the biggest odds that an entrepreneur might face, built it up, through sheer grit, passion, quest for excellence, sense of purpose and desire to serve society, leveraging the competencies and support of his family.

- Being far-sighted, he structured the organization as a trust rather than as a private company, so that it's long-term existence is not jeopardized through potential family squabbles that plague many private corporations, especially after the passing away of the founder. It depends on neither government aid nor donations. It runs its own business of eye equipment, even as it treats over 70 per cent of its patients free in five cities of Tamil Nadu. Founded in 1976 in a rented house with only 11 beds, it is now a network of hospitals performing 280,000 surgeries annually. AECS has spread all over India apart from Madurai such as Tirunelveli, Theni, Coimbatore, Hyderabad, etc.(Prahald(2004); Kasturi Rangan(2007) and website: [www.oppapers.com/subjects/case-analys...and Munshi,\(2009\).](http://www.oppapers.com/subjects/case-analys...and Munshi,(2009).)

### **Innovative Case Narration**

About 40 million people in the world are blind. The prevalence of blindness in most industrialized countries of Europe and North America varies between 0.15% and 0.25%, compared with blindness rates of nearly 1.5% for the developing countries in Africa, Asia and Latin America. While age-related macular degeneration, diabetic retinopathy, and glaucoma are the dominant causes in developed countries, cataracts are the major cause of blindness in the developing countries, accounting for nearly 75% of all cases in Asia. A cataract forms as the natural lens of the eye clouds over time, and has to be surgically removed and replaced by an artificial one. The causes of cataracts are many, but lack of proper nutrition and the effects of tropical weather are certainly two of the more significant.

In 2006, an estimated 20 million people were blind from cataracts worldwide, more than 80% of them in developing countries. In 2006, India had nearly 7 million cataract-blind individuals, with roughly 3.8 million new cases occurring annually. With a population of over a billion, and a per-capita income of about \$600/year (PPP \$3,600), nearly 25% of Indians were considered to be below the poverty line, but much larger numbers (approximately 50%) were at income levels that would place treatment at private eye clinics beyond their reach. From its humble and tentative beginnings in 1976, Aravind has come a long way, and is today looked upon by the world as a leader in eye care.

### **Aravind Eye Care System (AECS)**

Aravind Eye Care System's main mission was, "To eradicate needless blindness by providing appropriate, compassionate, and high-quality eye care for all". Aravind Eye Care System comprises of

- Eye Bank
- Research
- Making Tecnology affordable
- Lions Aravind Institute of Community Ophthalmology(LAICO)
- Eye Care Facilities
- Community Outreach Programs
- Education and Training

- Women and Childcare- Aravind Center for Women, Children and Community Health (ACWCCH)

Thus, it can be concluded that Aravind Eye Care System is one of the most dominant poverty alleviation programmes, especially reaching the most needy eye disability care to the poorest section of the Indian society. The cause of utmost poverty of 9 million Indians as well as estimated 45 million people worldwide has motivated him immensely, and he started the eradication of needless blindness at least in Tamilnadu (his home state) to start with. Since then Dr. Govindappa Venkataswamy (Dr. V) never looked back. As is observed AECS has embarked upon to usher in the much needed innovative worldclass eye care system to the poorest people in rural and urban India. Focusing on innovations in the organisation of workflow from patient identification to postoperative care. Aravind has built the world's premier eye care institution. It is the largest eye care system in the world. It is also most productive, and boasts world-class outcome rates. (Pralhad, 2007).

### Case study: 2 e-Choupal: ITC's Rural Networking Project

In Hindi (an Indian language spoken in most parts of Northern and Central India), a *choupal* is a village gathering place. The *e-choupal* initiative—whereby a choupal is equipped with a computer and Internet connectivity—is the brainchild of a large agricultural processing company in India, the Indian Tobacco Company (ITC). The initiative was conceived to tackle the challenges posed by certain features of Indian agriculture, such as fragmented farms, a weak infrastructure, and the involvement of numerous intermediaries. Although the primary objective of the project was to bring efficiency to ITC's procurement process, an important byproduct is the increased empowerment of rural farmers where e-choupals have been established. The major underline tenet of the scheme is to reach the knowledge, ITES and suitable employment to the needy farmers and other agrarian populace. Thus, it will be observed that it not only imparts knowledge to the farmers but also impart them with employment as per the requirement (Pralhad (2007); Kasturi Rangan (2007) and website: <http://www.citesales.com/118-e-choupal-case-study.html>)

Launched in June 2000, 'e-Choupal', has already become the largest initiative among all Internet-based interventions in rural India. 'e-Choupal' services today reach out to more than 3.5 million farmers growing a range of crops - soyabean, coffee, wheat, rice, pulses, shrimp - in over 31,000 villages through 5372 kiosks across seven states (Madhya Pradesh, Karnataka, Andhra Pradesh, Uttar Pradesh, Maharashtra, Rajasthan and Kerala).

If a VSAT (Very Small Aperture Terminal) has to be mounted, the investment moves up to Rs 100,000. E-choupals are operated by a **sanchalak** (operator), a literate person who is elected from among the farmers of the village. He acts as an interface between the computer and the illiterate farmers, and retrieves information on their behalf ITC's International Business Division, one of India's largest exporters of agricultural commodities, has conceived e-Choupal as a more efficient supply chain aimed at delivering value to its customers around the world on a sustainable basis.

The e-Choupal model has been specifically designed to tackle the challenges posed by the unique features of Indian agriculture, characterised by fragmented farms, weak infrastructure and the involvement of numerous intermediaries, among others. The intermediaries are not removed from the value chain. Their roles are redefined to **samajojaks** (coordinators), who assist ITC in setting up new e-choupals by conducting village surveys and by identifying the best sanchalaks. They manage the physical transportation of sales made at the e-choupal, collect price data from local auctions, and maintain records. Thus, it will be seen that sanchalak and samajojaks are on of the hub point of the functional aspects of e-choupal and its connected activities.

Such a market-led business model can enhance the competitiveness of Indian agriculture and trigger a virtuous cycle of higher productivity, higher incomes, enlarged capacity for farmer risk management, larger investments and higher quality and productivity. Further, a growth in rural incomes will also unleash the latent demand for industrial goods so necessary for the continued growth of the Indian economy. This will create another virtuous cycle propelling the economy into a higher growth trajectory.

Factors contributing to the success of e-choupal are the partnerships built with academia and NGOs to create and document relevant knowledge about agricultural practices that are useful for farming communities. Another success factor was the participatory method in which ITC tried to understand the information needs of rural communities.

ITC plans to scale up the model to cover 15 states in the next 7 years, reaching 100,000 villages. It plans to diversify into products such as horticulture, rice, and cotton. A plan to market and distribute other firm's services related to microcredit, insurance, health, and education through the same e-choupal "channel" infrastructure is also underway. Such a scale-up would require very large investments, of the order of US\$200 million.

Thus, we can conclude that the e-Choupals, information centers linked to the Internet, represent an approach to seamlessly connect subsistence farmers with large firms, current agricultural research, and global markets. This programme reaches to the poor people and farmers are benefitted by realizing better prices for their crops, better yield through better practices, and a sense of dignity and confidence in being connected with the rest of the world.

## **7. FUTURISTIC STRATEGY FOR POVERTY ALLEVIATION ENDEAVOURS**

After independence in 1947 all the politicians like Prime Minister Jawaha Lal Nehru, President Rajendra Babu, and later Indira Gandhi. Lal Bahadur Shastri and the present leaders (Dr. Abdul Kalam, Dr.Manmohan Singh (PM) etc, all had the clarion call of 'Garibi Hatao' and 'Poverty Alleviation Programmes/Schemes. It is worth noting that during immediately after independence, in 1947, India's annual income was US\$439, compared with US\$619 for China; US\$770 for South Korea, and US\$936 for Taiwan. By 1999, the numbers were US\$18.18; US\$ 3,259; US\$13,317 and US\$15,720 respectively. In other words, the average income in India was not much different from South Korea in 1947, but South Korea became a developed country by 2000s. And, at the same time, India was left as one of the world's poorer countries.

Though, we speak about and widely acknowledged fact that, India's offshore IT software and service industry is dominated by the world-class vendors like Infosys, TCS and Wipro. Globalisation (rather LPG-'Liberalisation, Privatization and Globalization) has made a dent for, cheaper outsourcing of product/sources, from wherever it is best available. This also includes marketing where it gets more profit in the boundary less scenario of the world. Also, even global exports have tripled from \$3.45 trillion to \$9.12 trillion between 1992 to 2004. India is marching well ahead consistently among BRIC countries (Brazil, Russia, India and China), and as per Goldman Sachs, BRIC countries may contribute to nearly 70% of global growth by 2040(Pathak, 2009). And globally today China and India is collectively called 'CHINDIA' which positively accounts for good chunk of talented pool of resources of the world. The dream of our Past President Dr. Abdul Kalam for converting India as "World Knowledge Platform" and further "Developed Nation" by 2025 is waiting for all of us to watch & witness. This requires all of us to work with dogged determination gusto and passion.

New estimates will be available by the end of the Tenth Plan Period for poverty level. Observing the above facts, figures and data of Fig.2 and Table 1, it is felt that some focused and determined functional activities/efforts are required, and it is dire essential to reach the facilities of the various programmes / schemes to the poor section. Some real strategy and tactics have to be devised for poverty alleviation measures. Also, some valiant observations/ findings out of a research study in the subject are discussed in the succeeding paragraphs.

The following measures are to be taken for futuristic effective implementation of poverty alleviation programmes/schemes.

- We should have some strict norms/monitoring techniques for ensuring the facilities of Government. Private sectors/NGOs to reach to the poorer section for whom the schemes are made. Fund disbursement is dire essential to reach the needy.

- Apart from Government agencies, the people participation is most desirable for making the schemes a success.
- 41% of rural households are landless. The poverty alleviation schemes should enhance and reach the poorest for rural land distribution.
- The poverty alleviation programmes should be accountable and transparent.
- Approximately 55% of urban poverty results from a crisis in the industry. The Government scheme should insist on problem-solving of industrial crisis.
- According to NCAER (National Council of Applied Economic Research) survey of 2010, the rural population in future few decades about 45% is migrating to urban area. This should be suitably controlled.
- Rural Employment Generation Programme (REGP) should be more effectively implemented.
- Various governance mechanisms for successful implementation of the programme is to be strictly monitored/ ensured.
- Use of ICT (Information Communications Technology) and innovative techniques requires effective and transparent implementation.

### **Force-Multipliers: Dynamic Interplay: Key to Success**

The dynamic interplay of many force multipliers should take place for eradicating poverty. These are:

- Force of Market.
- Force of Technology.
- Force of Human Capital.
- Force of spiritual knowledge economy.

Today, the mankind is standing at the threshold of 'New Age of Knowledge Economy' - apparently as most of any corporate 'value system' is based and depends upon harnessing, 'intangible assets', rather than 'tangible assets', and this is very challenging task. The conventional/traditional approach and analysis of society has been more central to market technological approach to problem solving, and their issues/ policies of the society. This horizontal movement and axis- view point has ignored the vertical axis capitalization of "spiritual knowledge economy", which is a motivational and consistent dimension of work-culture developing around people, the much needed value-centric gains. This decidedly requires to take a 'holistic perspective approach' of all the value-based tenets, which may certainly avoid Nandigram, Tehri or Medha Patkar's unidirectional movements.

## **8. CONCLUSIONS**

The world today has ushered in 'a New Age of Economics' and 'Holistic Globalisation', wherein dynamic interplay of many promotional activities and 'force-multipliers' are taking place. The problem of poverty and poor people is one dominant factor, which solely disturbs the whole world, whether it's Poverty in US, or India, Africa or Latin American countries. Despite the sobering facts, that men & women who dwell at the base of the pyramid - so called Bottom of the Pyramid (BOP)- have begin to capture the attention of the sane people of the world. Today, the various corporate sectors are evincing much keen interest for alleviation of poverty for such poor segments all over the world.

It is also a stark fact, that there is not enough tax money in the world to make a dent in poverty. And, when this poverty challenge is facing with such dire problem, we cannot look up to the heavens and pray God for solution. We all have to roll up our sleeves and solve the problem together with regulations of Government and their policies as well as active participation of our people. Decision-making is the biggest problem in today's context. To a developed nation by 2025 - dream of Dr. Abdul Kalam, the Government need to re-structure the Antipoverty programmes as per the actual need of the rural and affected people. There is more a dire essential need to bring in the attitude of people and they should actively and effectively participate in the global poverty alleviation measures.

The two case studies, show on the ground that how some of the enlightened people among us from the very cross-section of society have started the yeoman service to poor segment in real earnest and 'humility' way. It is their magnanimity which should usher in colours and make dent in poverty of the millions for basking in true 'quality of life' fashion. Before we all go out of business, we all should

provide tremendous social value for tackling poverty with all our might. This will decidedly show us the dawn of rising sun- a better tomorrow and a sustainable better future.

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## SOLUTION FOR LINEAR PROGRAMMING

Dr. Pruethsan Sutthichaimethee

### ABSTRACT:

*The limitation of the resources requires Linear Programming to develop the policy in order to reach the highest potential and target. Linear Programming can be used in the production planning, financial planning, marketing, food ingredient and product, human resource management, and transportation. Linear Programming is mathematics with optima solution for factor analysis and certain ratio, called equal one. The use of Linear Programming is an option for developing a model on management. Linear Programming was created in 1920 and later called Simplex Method and Simplex Linear Programming*

### 1. COMPONENTS OF LINEAR PROGRAMMING

1. Objective Functions are made up of factors for decision-making to reach maximum profits and minimum costs.
2. Conditions are the criteria for decision-making under the limitations and rules, which can be in equation or non-equation but certainly linear.
3. Decision Variables or optional variables are factors besides conditions. This variable has to be zero or positive figures only or non-negative conditions.

### 2. LINEAR PROGRAMMING MODEL

1. Normal Form or Normal Form with variables and the 'm' set of limitations include these two cases:

$Z$  is the value of the targeted equation as the index of decision making with the maximum profits.

$\alpha_{ij}$  is a coefficient value of decision or coefficient value of fixed variables in decision  $x_j$

$\beta_j$  is a variable of production in the 'j' kinds.

$i = 1, 2, 3, \dots, m, j = 1, 2, 3, \dots, n$

Objective Function :

$$\text{Max Profit or Min Cost } Z = c_1x_1 + c_2x_2 + c_3x_3 + \dots + c_nx_n \quad (1)$$

Condition

$$\alpha_{11}x_1 + \alpha_{12}x_2 + \alpha_{13}x_3 + \dots + \alpha_{1n}x_n \begin{cases} \leq \\ = \\ \geq \end{cases} \beta_1$$

$$\alpha_{21}x_1 + \alpha_{22}x_2 + \alpha_{23}x_3 + \dots + \alpha_{2n}x_n \begin{cases} \leq \\ = \\ \geq \end{cases} \beta_2$$

.....

$$\alpha_{m1}x_1 + \alpha_{m2}x_2 + \alpha_{m3}x_3 + \dots + \alpha_{mn}x_n \begin{cases} \leq \\ = \\ \geq \end{cases} \beta_m \quad (2)$$

$$x_j \geq 0 \quad j = 1, 2, 3, \dots, n \quad (3)$$

2. The Canonical Form is Linear Programming with summation in a normal form.

Objective Function:

$$\text{Max Profit or Min Cost } Z = \sum_{j=1}^n c_j x_j \quad (4)$$

Condition

$$\sum_{j=1}^n \alpha_{ij} x_j \quad \left\{ \begin{array}{l} \leq \\ = \\ \geq \end{array} \right\} \beta_i \quad (5)$$

$$x_j \geq 0 \quad j = 1, 2, 3, \dots, n \quad (6)$$

3. The Matrix form is Linear Programming with three vectors and one matrix set: vector  $\delta$ , vector  $x$  and  $\beta$ , matrix  $A$ .

Objective Function:

$$\text{Max Profit or Min Cost } Z = \delta'_j x_j \quad j = 1, 2, 3, \dots, n \quad (7)$$

$$\begin{bmatrix} \alpha_{11} & \alpha_{12} & \alpha_{13} & \dots & \alpha_{1n} \\ \alpha_{21} & \alpha_{22} & \alpha_{23} & & \alpha_{2n} \\ \alpha_{31} & \alpha_{32} & \alpha_{33} & & \alpha_{3n} \\ \vdots & \vdots & \vdots & & \vdots \\ \alpha_{m1} & \alpha_{m2} & \alpha_{m3} & \dots & \alpha_{mn} \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ \vdots \\ x_n \end{bmatrix} \quad \left\{ \begin{array}{l} \leq \\ = \\ \geq \end{array} \right\} \begin{bmatrix} \beta_1 \\ \beta_2 \\ \beta_3 \\ \vdots \\ \beta_m \end{bmatrix}$$

$$\alpha x \quad \left\{ \begin{array}{l} \leq \\ = \\ \geq \end{array} \right\} \beta_i \quad (8)$$

$$\begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ \vdots \\ x_n \end{bmatrix} \geq 0 \quad j = 1, 2, 3, \dots, n \quad (9)$$

### Linear Programming at the Firm

$$\text{Maximize } Z = 80x_1 + 60x_2 + 90x_3 \quad (1)$$

**Constraints**, Subject to : Sub to

$$6x_1 + 2x_2 + 4x_3 \leq 800 \quad (2)$$

$$8x_1 + 4x_2 + 4x_3 \leq 1,200 \quad (3)$$

$$4x_1 + 8x_2 + 4x_3 \leq 1,400 \quad (4)$$

**Restriction**  $x_1, x_2, x_3 \geq 0 \quad j = 1, 2, 3$

### Calculation of Linear Programming

There are various suitable calculation of Linear Programming. This article will analyze the differences of each method such as Simplex Method as well as introduce the Excel Solver as an instrument.

### Simplex Method

This method includes two characteristics: Maximum Linear Programming and Minimum Linear Programming.

#### 1. Standard Form

1.1 Constraints includes these mathematic symbols  $\leq$  to fill a slack variable : +S on the left side of the equation in order to change the non-equation to equation (=)

1.2 Constraints includes these mathematic symbols  $\geq$  to fill a surplus variable : -S and artificial variable (:A) on the left side of the equation in order to change the non-equation ( $\geq$ ) to equation (=)

1.3 Constraints includes these mathematic symbols = to fill an artificial variable (:A) the left side of the equation.

1.4 Restriction includes different variables of decision ( $x_j, j = 1, 2, 3, \dots, n$ ) with slack variables, surplus variables, and artificial variables. These variables have to be more than zero or more.

1.5 Objective Function is filled with constraints in every standard form limited by efficient values as the following:

A slack variable is + 0S

A surplus variable is + 0S

An artificial variable is Negative Big M ( $-MA$ ) If the equation is Minimize C, it will be Big M (+M)

### Standard Form of Linear Programming

$$\text{Maximize } Z = 80x_1 + 60x_2 + 90x_3 + 0S_1 + 0S_2 + 0S_3 \quad (5)$$

$$\text{Sub to: } 6x_1 + 2x_2 + 4x_3 + S_1 + 0S_2 + 0S_3 = 800 \quad (6)$$

$$8x_1 + 4x_2 + 4x_3 + 0S_1 + S_2 + 0S_3 = 1,200 \quad (7)$$

$$4x_1 + 8x_2 + 4x_3 + 0S_1 + 0S_2 + S_3 = 1,400 \quad (8)$$

$$x_1, x_2, x_3, S_1, S_2, S_3 \geq 0$$

2. Standard Form should be in the Preparatory Simplex Method as the following:

Table 1: Fundamental Data

		$C_j$	80	60	90	0	0	0	-
Table 1	$C_i$	Basis Cell	$x_1$	$x_2$	$x_3$	$S_1$	$S_2$	$S_3$	Result
	$R_1^3$	$S_1$	6	2	4	1	0	0	800
	$R_1^4$	$S_2$	8	4	4	0	1	0	1,200
	$R_1^5$	$S_3$	4	8	4	0	0	1	1,400
		$Z_j$	0	0	0	0	0	0	0
		$C_j - Z_j$	80	60	90	0	0	0	-

The total of multiplication, in a vertical manner between  $C_i$  and an efficient value with variable and the result in the simplex table, will calculate  $Z_j$ .

$$Z_1 = (0)(6) + (0)(8) + (0)(4) = 0$$

3. The result review includes the cell  $C_j - Z_j$  in the table. If the result is the most suitable,  $C_j - Z_j$  in a maximum value will be zero or negative. If the value is minimum, it will be positive or zero.

4. Result Enhancement will include:

4.1 Entering variable column axis

4.2 Existing variable row axis

Table 2 Existing Variable Row Axis

		$C_j$	80	60	90	0	0	0	-	
Table 1	$C_i$	Basis Cell	$x_1$	$x_2$	$x_3$	$S_1$	$S_2$	$S_3$	Result	Ratio
$R_1^3$	0	$S_1$	6	2	4	1	0	0	800	800/4 = 200
$R_1^4$	0	$S_2$	8	4	4	0	1	0	1,200	1,200/4 = 300
$R_1^5$	0	$S_3$	4	8	4	0	0	1	1,400	1,400/4 = 350
		$Z_j$								
		$C_j - Z_j$								

4.3 Enhancement of an efficient value in the simplex table.

$$R_2^3 = R_1^3 / \text{Saddle Variable}$$

5. The finding of the result will find  $Z_j$  in the total of multiplication between the  $C_i$  value and the efficient value with variables in the simplex table.

6. The result review will be enhanced for the first time with the values in the cell  $C_j - Z_j$

Table 3 The result review will be enhanced for the first time with the values

		$C_j$	80	0	90	0	0	0	-	
	$C_i$	Basis Cell	$x_1$	$S_3$	$x_3$	$S_1$	$S_2$	$S_3$	Result	Ratio
$R_3^3$	90	$x_3$	5/3	0	1	1/3	0	-1/12	150	
$R_3^4$	0	$S_2$	4/3	0	0	-2/3	1	-1/3	200	
$R_3^5$	60	$x_2$	-1/3	1	0	-1/6	0	1/6	100	
		$Z_j$	130	60	90	20	0	5/2	19,500	
		$C_j - Z_j$	-50	-60	0	-20	0	-5/2		

If every value is suitable. The second enhancement will make every value be '0' and negative. As a result, the result will be the most suitable.

$$\text{Maximize } Z = 19,500 \text{ with } x_2 = 100, x_3 = 150 \text{ the most suitable value}$$

### Excel Solver

This instrument includes these following steps:

Create "Solver Add-Ins" under the Tools Menu.

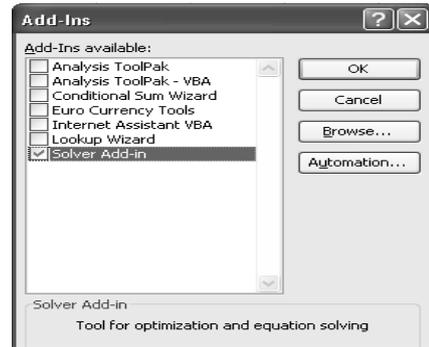
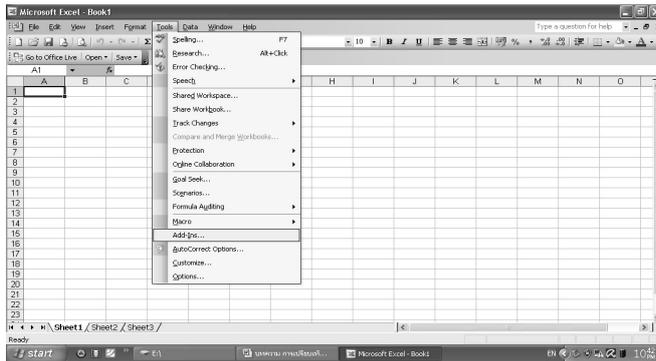


Figure 2 Solver Add-Ins  
2. Create "Worksheet" to analyze the optimal solution from Solver Parameters

	A	B	C	D	E	F
1	<b>Objective Value</b>	<b>Variable</b>	<b>Solution</b>	<b>Constraints</b>	<b>Result</b>	
2	=80*C2+60*C3+90*C4			=6*C2+2*C3+4*C4	800	
3				=8*C2+4*C3+4*C4	1,200	
4				=4*C2+8*C3+4*C4	1,400	
5						
6						
7						

Figure 3 Add Data into the Worksheet.

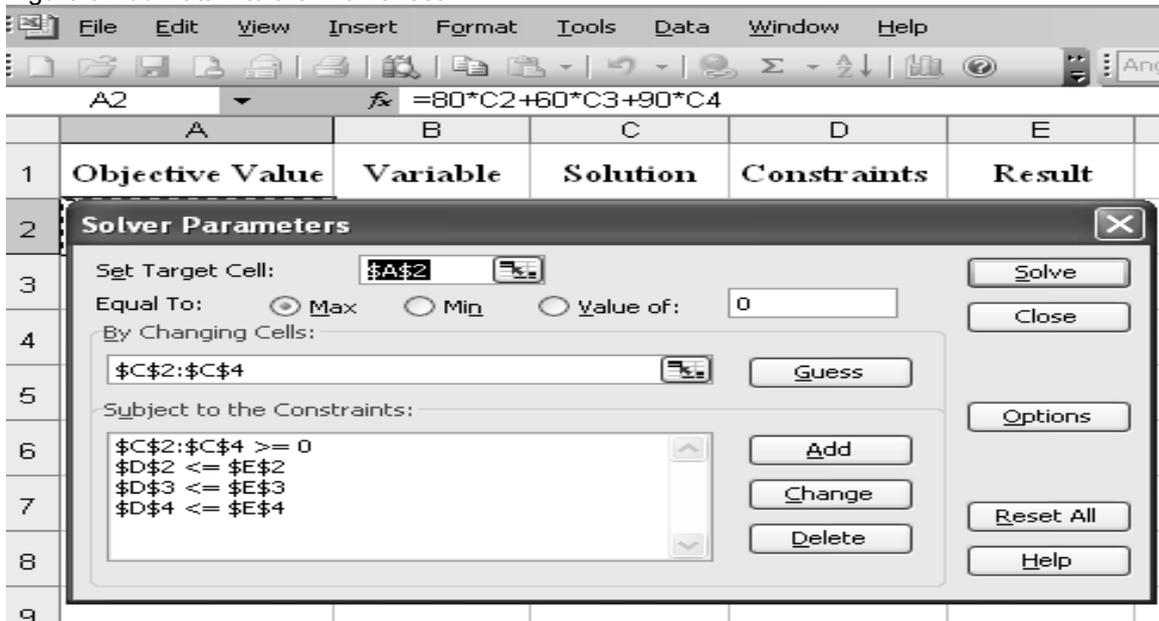
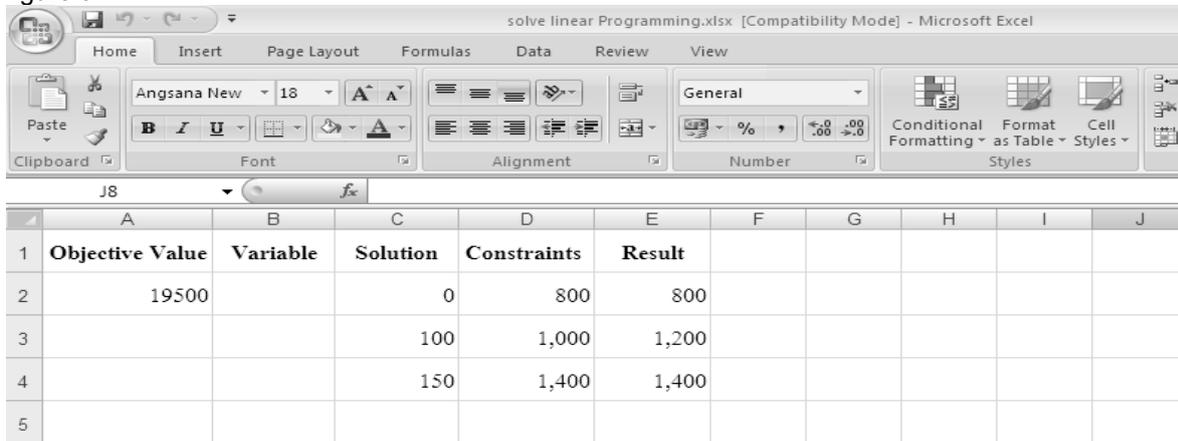


Figure 4 Dialogue Box of Solver Parameter  
1. Set a target cell as an objective function.

2. By changing cells, put solutions into the Excel in order to generate as much as 200 variables.
3. Subject to the Constraints is a cell for specific equations.

After every cell is filled, press the Solve button to calculate and the result will be shown as seen in the figure 5



	A	B	C	D	E	F	G	H	I	J
1	<b>Objective Value</b>	<b>Variable</b>	<b>Solution</b>	<b>Constraints</b>	<b>Result</b>					
2	19500		0	800	800					
3			100	1,000	1,200					
4			150	1,400	1,400					
5										

Figure 5 Results from Excel Solver

Maximize  $Z = 19,500$  with  $x_1 = 0, x_2 = 100, x_3 = 150$  the most suitable value

### 3. CONCLUSION

This article includes two kinds of Linear Programming: Simplex Method and Excel Solver. They both have strengths and weaknesses as the following:

#### Strengths

1. Efficient for calculating more than two decision variables.
2. Efficient for the balance calculation

#### Weaknesses

Decision variables are more than 2 and it is complicated to find the balance. The calculation has to be thorough and requires a lot of skills. One mistake can bring an obvious problem.

However, the computer should be used to calculate in Linear Programming. The Excel Solver as introduced in this article has both strengths and weaknesses as the following:

#### Strengths

1. Efficient for Linear Programming with many variables less than 200 corresponding to the fact.
2. Fast calculation with low risks of errors.
3. Accessible for every group of consumers.
4. Time-saving
5. Easy to learn
6. Saving money

#### Weaknesses

Using the program requires time to learn. Without sufficient skills, mistakes can be produced.

**Suggestion**

Linear Programming with Graphical Technique and Simplex Method has strengths and weaknesses. The user has to consider the conditions of the assignment and find the best method to suit it.

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# **AN ANALYSIS OF THE TREND FOR COMPETITIVENESS OF THAI PRODUCTS, COMPUTERS AND PARTS, TO THE U.S.A. MARKET**

Dr. Pruethsan Sutthichaimethee

## **ABSTRACT**

*After comparing the competitiveness of computers and their components produced in Thailand, this study found that in Thailand, the hard disk drive has become the number one produced and exported product to the world. When discussing about Power Supply, it found that Thailand has been less competitive than China. This is due to the fact that the power supply has been mainly manufactured in China and exported up to 96 percent compared to any other computers and parts. Moreover it can be seen in this study, that not only are there not many Power Supply factories in Thailand but also Thailand has some difficulties producing the Power Supply owing to lacking suppliers and raw materials. When discussing about computer keyboards, this study highlighted that Thailand is more competitive than China, Japan and Vietnam as keyboards made in Thailand have reached the standard required by the market. According to analysis of export competition for Hard Disk Drive, Power Supply and Keyboard, this study revealed that thanks to the currency exchange comparison between Thai Baht and US dollars, Thailand has become the country where computers and parts have been exported to the USA. However, it revealed that USA revenue has been one of the profound factors when computers and their components have been considered for import to the country*

**Keywords:** Hard Disk Drive /Power Supply / Keyboard /computer and parts/ U.S.A. Markets

## **1. INTRODUCTION**

There are a lot of agricultural and industrial products and service in Thailand in export. One of the important products in the export is computer parts and computers. Thailand is one of the top countries that export a large number of computer parts and computers as many as 55% of the sale the world. With skillful labors and a lot of potential in manufacturing, 87% of the computer parts and computer produced in Thailand are for export, or 51% of the sale in the world. From 1998 to 2011, Thailand has increased the number of exported computer parts and computers at 135.5%, mostly to the USA at the value of 47,000 million baht, or 27.50% of the exported computer parts and computers in Thailand.

However, the number of exported computer parts and computers from Thailand to the USA has been altering because of internal factors in Thailand such as manufacturing costs, quantity, and economic problems, and external factors such as prices, competitors, and the economic problems in the USA.

Consequently, the analysis of the competitiveness of Thai products, computers and parts, to the USA market is essential because the derived data from this analysis can be used to plan and improve the business in the long run.

## **2. OBJECTIVES OF THE STUDY**

1. To analyze the potential of Thailand in exported computers and parts to the U.S.A. market.
2. To analyze factors of the demand in U.S.A for the computers and parts, and the tendency of the demand.
3. To suggest the means to improve the exported computers and parts to the U.S.A. market.

## **Expected Outcomes**

1. Tools for plan and policy development to solve the cost of natural rubber production.

2. Publication to benefit the further research.

**The data used in research.**

The data used in the research is secondary data and Interviews. Using time series data are divided into two sections: the first part of the annual 2002 - 2011 The second part of the quarterly data from 2002 - 2011, including 40 quarter.

**3. MODEL OR AREA OF THE STUDY**

The model used in this study is the model of the demand in the computers and parts export from Thailand to the U.S.A dividing into different kinds of computers and parts such as Hard Disk Drive, Power Supply, and Keyboard. The analysis includes Multiple Regression Analysis and Ordinary Least Square Method in the form of ARIMA (Auto Regressive Integrated Moving Average) with Error Correction Mechanisms (ECM) to explain Short Run Dynamic Adjustment of different variables leading to Long Run Equilibrium Relationship. There are three kinds of equations in this study: Hard disk drive (H), Power supply (P) and Keyboard (K). The variables of the demand in the computer and parts export from Thailand to the U.S.A. have the same equations in all three equations with the details as the following.

$$\Delta \ln Q_{(H,P,K)_t} = \sum_{i=1}^n \alpha_{1i} \Delta \ln Q_{(H,P,K)_{t-i}} + \sum_{i=1}^m \alpha_{2i} MA_i + \alpha_3 \Delta \ln P_{(H,P,K)_{t-i}} + \alpha_4 \Delta \ln E_{t-i} + \alpha_5 ECM + \alpha_6 \Delta \ln Y_{t-i} + \varepsilon_t$$

where

$Q_{(H,P,K)_t}$  = Volume of imports of computers and parts (H, P, and K) in the period t

$P_{(H,P,K)_{t-i}}$  = Price (C.I.F) for H, P, and K in the period (t-i)

$E_{t-i}$  = exchange rate in the period t-i

ECM = Error Correction Mechanism

MA(i) = Moving Average

$Y_{t-i}$  = GDP Per Capita in the period t i ,  $\varepsilon_t$  = error in the period t

So that,  $\sum_{i=1}^n \alpha_{1i} \Delta \ln Q_{x_{t-i}} + \sum_{i=1}^m \alpha_{2i} MA_i$  is Autoregressive (AR) Integrated (I) and Moving Average

(MA) of the ARIMA model. For the factors of  $P_{(H,P,K)_{t-i}}$ ,  $E_{t-i}$  and  $Y_{t-i}$  is Exogenous Variable (X) of ARIMAX Model.

**Hypothesis**

1. The relation of the imported quantity (i) in the U.S.A. in the period (t-i) will correspond to the imported quantity (i) in the U.S.A. in the current period. If the imported quantity of products in the U.S.A. in the period (t-i) increases, the imported quantity in the U.S.A. in the current period will increase.

2. The relation between the price of the imported products (i) and the imported quantity (i) in the U.S.A. will be in contrast. That means if the price of the imported product (i) increases, the imported quantity will reduce.

3. The relation between the exchange rate and the imported quantity (i) in the U.S.A. is in the similar way. If the exchange rate of US dollars increases, the imported quantity (i) in the U.S.A. will increase.

4. The relation between the imported quantity (i) in the U.S.A. and the national income in the U.S.A. is in the similar way. If the national income in the U.S.A. increases, the imported quantity (i) will increase.

**4. LITERATURE REVIEW**

Jirapan Kuldilok (1981) conducted the study of Thai export with the objective to lessen a balance of trade deficit. The study included the demand and supply of the export emphasizing in industrial products. The data were both primary and secondary to introduce the structure of export enhancement in Thai trade. The study examined the Domestic Resource Cost of the product to compare the production and suggest the suitable production to be supported and promoted.

The study suggested that the government should have had an evident plan to promote exported products; for example, providing more benefits to the exported in Thailand, promoting the foreign investment in Thailand, improving the standard of product quality, collaborating with partners, reducing the customs tax for imported material, and promoting the domestic production to replace imported material.

The study by the research center at Sasin Institute, Chulalongkhorn University (2004): “The development of the system for the network of enterprise industry such as leather, clothing, and natural rubber”, had the objective to enhance the potential and quality of fashion products in Thailand by lessening the imported quantity and cost of raw material.

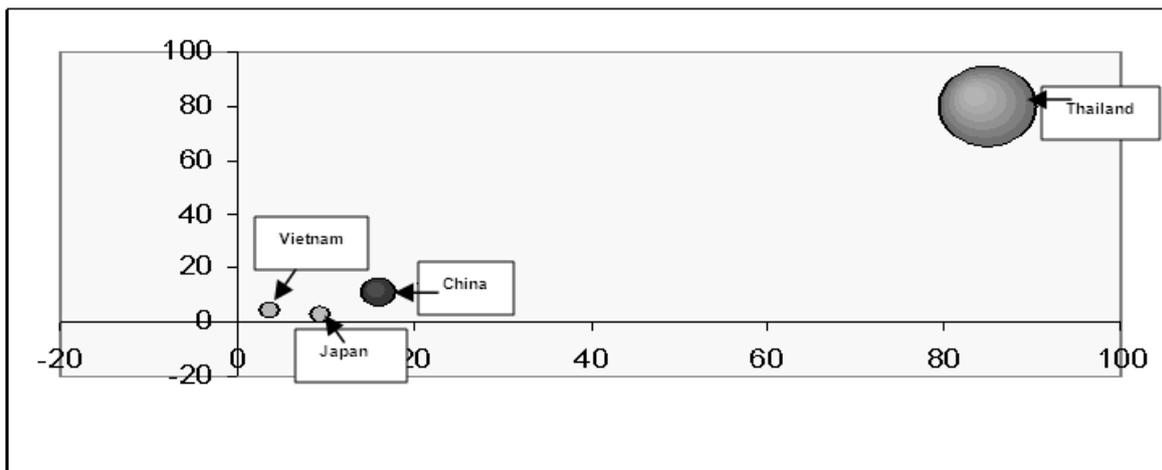
The series of natural rubber industry development by Thailand Research Fund (2004): “The complete study of the seminar and training project on industrial technology of natural rubber production corresponding to the industry reform, phase 2”, had the objective to educate the participants in the seminar and training on industrial technology of natural rubber production to be used in the improvement of the industry.

**5. THE RESULT FOR RESEARCH AND CONCLUSION**

**The Result of RCA**

The result of Revealed Comparative Advantage (RCA). The detail as the following:

**Hard Disk Drive**

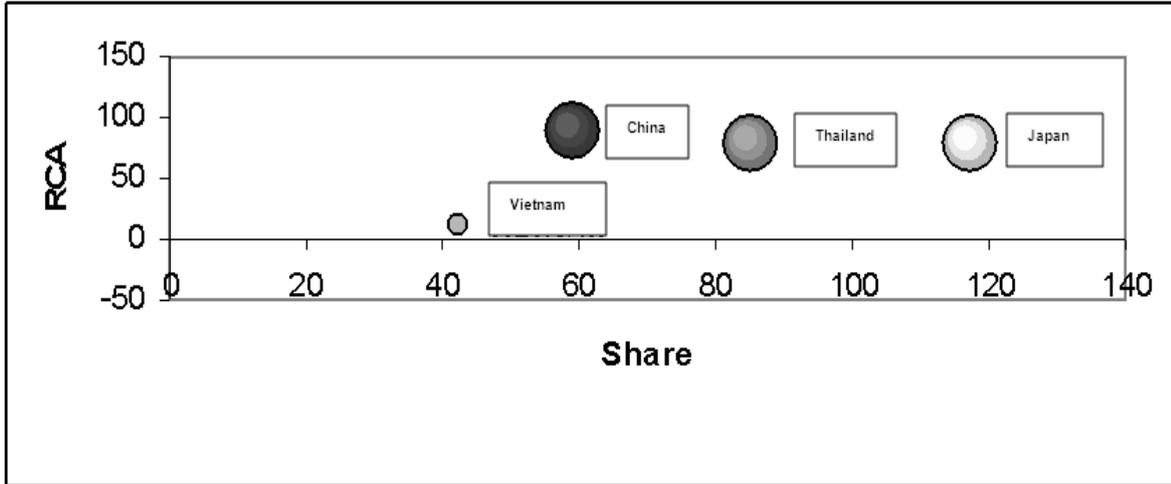


**Figure 2** This point of the comparative advantage of Thailand, Hard disk drive in the U.S.A. market, 2011

**Background:** Calculation

From the 2<sup>nd</sup> figure, Thailand shows a great potential in exporting Hard disk drive of computers and parts to U.S.A. because Thailand owns the greatest amount of computers and parts. Hard disk drive from Thailand are the most popular in the world to be used in the industry. So that the demand in U.S.A. has been increasing

**Power Supply**

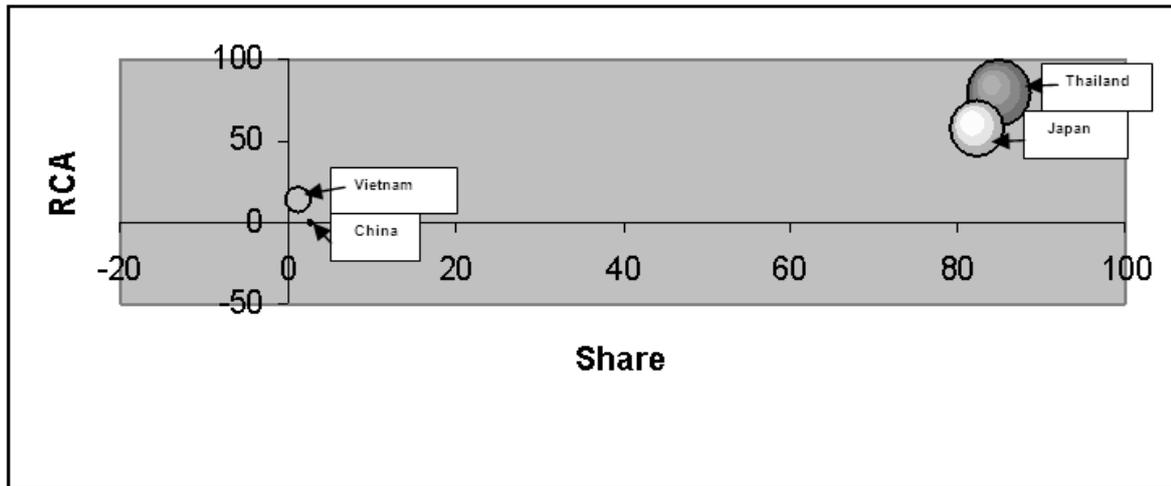


**Figure 3** This point of the comparative advantage of Thailand, Power Supply in the U.S.A. market, 2011

**Background:** Calculation

From the 3<sup>rd</sup> figure, the potential of Thai Power Supply has been decreasing since 2010 showing the change of RCA at 2.75%. RCA was 70.89 in 2011. The market of the Power Supply has been expanding since then.

**Keyboard**



**Figure 4** This point of the comparative advantage of Thailand, Keyboard in the U.S.A. market, 2011

**Background:** Calculation

From the 4<sup>th</sup> figure, the potential of exported concentrated Keyboard is 90.2% of U.S.A.'s market and RCA is 83.04. However, the amount of the export decreased in 2010 because of the scarcity of the raw material and lower quality of the related material

### The result of ARIMA

The data with Stationary at First Difference including ECM found that the variables of the demand, in the computers and parts export from Thailand to the U.S.A. market in each kind of computers and parts such as Hard Disk Drive, Power Supply, and Keyboard, have the same equations in Short-Termed Dynamic Demand. The calculation of the equation is the following:

#### Hard Disk Drive

$$\begin{aligned} \Delta \ln Q_{H_t} = & 0.7021 + 3.3233 \Delta \ln Q_{H_{t-1}} - 0.9202 MA_1 + \\ & (27.12)^{***} \quad (7.44)^{***} \quad (-40.40)^{***} \\ & 1.5266 MA_2 + 0.6945 MA_5 - 3.1295 \Delta \ln p_{H_{t-1}} + \\ & (23.79)^{***} \quad (8.52)^{***} \quad (-2.79)^{**} \\ & 4.0339 \Delta \ln I_t + 3.8840 \Delta \ln E_{t-1} - 0.7205 ECM + \\ & (9.50)^{***} \quad (2.98)^{***} \quad (-0.59)^{***} \quad (1) \end{aligned}$$

$R^2 = 0.89$  Adjust  $R^2 = 0.87$  LM – Statistic = 7.6 ARCH Test = 0.12 Ramsey RESET Test = 0.0017 Jarque – Bera = 0.35

The equation (1) can be explained with these details:

1. The adjustment of the imported quantity in a quarterly period (t) is related to the adjustment in one previous periods ( $Q_{x_{t-1}}$ ) with the statistic significance at 0.01 and the elasticity at 3.3233. It means that the variables are stable, the relative exported quantity in the current period and two previous periods changes at 1%, leading to the adjustment of the exchange rate for the computers and parts import at 3.3233 % in the similar manner. The result is corresponding to the hypothesis.
2. The adjustment of the imported quantity in the (t) quarterly period is related the adjustment of the price in one previous periods ( $P_{x_{t-1}}$ ) with the statistic significance at 0.05 and the elasticity at -3.1295. It means that the variables are stable, the relative price in the current period and the two previous periods changes at 1%, leading to the adjustment of the imported quantity in the current period at 3.1295 % in the contrasting manner. The result is corresponding to the hypothesis
3. The result from the ECM model with Residual from Co-integration as one of the variables finds that the coefficient at -0.7205 with the statistic significance at 0.01 suggests the short-termed economic variables, used to explain the adjustment of the imported quality having the statistic significance as referred in the above detail. The coefficient as a negative figure shows the equilibrium value in the previous periods with the adjustment to solve the fluctuation lessening in each quarterly period at 72.05 %. It means that the adjustment will respond to the previous errors (ECM) and the long-termed equilibrium value will be decreased at 72.05 % in the transferring period. This change is quite significant.
4. The adjustment of the imported quantity in the (t) quarterly period is related the adjustment of GDP Per Capita in period ( $I_t$ ) with the statistic significance at 0.01 and the elasticity at 4.0339. It means that the relative adjustment of GDP Per Capita in three previous periods with the stable variables changes at 1%. The imported quality in the current period changes at 4.0339 % in the similar manner. The result is corresponding to the hypothesis.
5. The adjustment of the imported quantity in the (t) period is related to the adjustment of the US dollar exchange rate in one previous period ( $E_{t-1}$ ) with the statistic significance at 0.01 and the elasticity at 3.8840. It means that the relative adjustment of the US dollar exchange rate in two

previous periods with the stable variables changes at 1%, leading to the adjustment of exported quantity at 3.8840 % in the similar manner. The result is corresponding to the hypothesis.

### Power Supply

$$\begin{aligned} \Delta \ln Q_{p_t} = & 0.4425 + 2.7440 \Delta \ln Q_{p_{t-1}} - 0.9002 MA_4 + \\ & (1.07) \quad (5.56) *** \quad \quad \quad (-3.73) *** \\ & 4.0003 \Delta \ln I_{t-2} + 1.3002 \Delta \ln E_{t-1} - 0.8585 ECM + \\ & (2.96) *** \quad \quad \quad (1.78) ** \quad \quad \quad (-3.50) *** \\ & - 2.2811 \Delta \ln p_{p_{t-1}} \\ & (-3.45) *** \quad \quad \quad \quad \quad \quad \quad \quad \quad (2) \end{aligned}$$

$R^2 = 0.67$  Adjust  $R^2 = 0.64$  LM – Statistic = 5.34 ARCH Test = 0.55 Ramsey RESET Test = 0.49 Jarque – Bera = 0.84

The equation (2) can be explained with these details:

1. The adjustment of the imported quantity in a quarterly period (t) is related to the adjustment in one previous periods ( $Q_{x_{t-1}}$ ) with the statistic significance at 0.01 and the elasticity at 2.7440. It means that the variables are stable, the relative exported quantity in the current period and two previous periods changes at 1%, leading to the adjustment of the exchange rate for the computers and parts import at 2.7440 % in the similar manner. The result is corresponding to the hypothesis.
2. The adjustment of the imported quantity in the (t) quarterly period is related the adjustment of the price in one previous periods ( $P_{x_{t-1}}$ ) with the statistic significance at 0.01 and the elasticity at -2.2811. It means that the variables are stable, the relative price in the current period and the two previous periods changes at 1%, leading to the adjustment of the imported quantity in the current period at 2.2811 % in the contrasting manner. The result is corresponding to the hypothesis
3. The result from the ECM model with Residual from Co-integration as one of the variables finds that the coefficient at -0.8585 with the statistic significance at 0.01 suggests the short-termed economic variables, used to explain the adjustment of the imported quality having the statistic significance as referred in the above detail. The coefficient as a negative figure shows the equilibrium value in the previous periods with the adjustment to solve the fluctuation lessening in each quarterly period at 85.85 %. It means that the adjustment will respond to the previous errors (ECM) and the long-termed equilibrium value will be decreased at 85.85 % in the transferring period. This change is quite significant.
4. The adjustment of the imported quantity in the (t) quarterly period is related the adjustment of GDP Per Capita in two previous periods ( $I_{t-2}$ ) with the statistic significance at 0.01 and the elasticity at 4.0030. It means that the relative adjustment of GDP Per Capita in three previous periods with the stable variables changes at 1%. The imported quality in the current period changes at 4.0030 % in the similar manner. The result is corresponding to the hypothesis.
5. The adjustment of the imported quantity in the (t) period is related to the adjustment of the US dollar exchange rate in one previous period ( $E_{t-1}$ ) with the statistic significance at 0.05 and the elasticity at 1.3002. It means that the relative adjustment of the US dollar exchange rate in two previous periods with the stable variables changes at 1%, leading to the adjustment of exported quantity at 1.3002 % in the similar manner. The result is corresponding to the hypothesis.

### Keyboard

$$\Delta \ln Q_{K_t} = 0.78347 + 4.5520 \Delta \ln Q_{K_{t-2}} - 0.8538 MA_5 +$$

$$\begin{aligned}
& \quad \quad \quad (0.10) \quad (9.74)^{***} \quad \quad \quad (-20.25)^{***} \\
(3.12)^{***} \quad & 2.3364 \Delta \ln E_{t-1} - 0.3532 ECM + 3.5410 \Delta \ln I_{t-1} \\
& \quad \quad \quad (-3.31)^{***} \quad \quad \quad (4.75)^{***} \\
& -6.0705 \Delta \ln p_{z_{t-1}} \\
& \quad \quad \quad (-3.455)^{***} \quad \quad \quad (3)
\end{aligned}$$

$R^2 = 0.84$  Adjust  $R^2 = 0.77$  LM – Statistic = 2.41 ARCH Test = 0.77 Ramsey RESET Test = 0.18 Jarque – Bera = 0.78

The equation (3) can be explained with these details:

1. The adjustment of the imported quantity in a quarterly period (t) is related to the adjustment in two previous periods ( $Q_{x_{t-2}}$ ) with the statistic significance at 0.01 and the elasticity at 4.5520. It means that the variables are stable, the relative exported quantity in the current period and three previous periods changes at 1%, leading to the adjustment of the exchange rate for the computers and parts import at 4.5520 % in the similar manner. The result is corresponding to the hypothesis.
2. The adjustment of the imported quantity in the (t) quarterly period is related the adjustment of the price in one previous periods ( $P_{x_{t-1}}$ ) with the statistic significance at 0.01 and the elasticity at -6.0705. It means that the variables are stable, the relative price in the current period and the two previous periods changes at 1%, leading to the adjustment of the imported quantity in the current period at 6.0705 % in the contrasting manner. The result is corresponding to the hypothesis
3. The result from the ECM model with Residual from Co-integration as one of the variables finds that the coefficient at -0.3532 with the statistic significance at 0.01 suggests the short-termed economic variables, used to explain the adjustment of the imported quality having the statistic significance as referred in the above detail. The coefficient as a negative figure shows the equilibrium value in the previous periods with the adjustment to solve the fluctuation lessening in each quarterly period at 35.32 %. It means that the adjustment will respond to the previous errors (ECM) and the long-termed equilibrium value will be decreased at 35.32 % in the transferring period. This change is quite significant.
4. The adjustment of the imported quantity in the (t) quarterly period is related the adjustment of GDP Per Capita in one previous periods ( $I_{t-1}$ ) with the statistic significance at 0.01 and the elasticity at 3.5410. It means that the relative adjustment of GDP Per Capita in two previous periods with the stable variables changes at 1%. The imported quality in the current period changes at 3.5410 % in the similar manner. The result is corresponding to the hypothesis.
5. The adjustment of the imported quantity in the (t) period is related to the adjustment of the US dollar exchange rate in one previous period ( $E_{t-1}$ ) with the statistic significance at 0.01 and the elasticity at 2.3364. It means that the relative adjustment of the US dollar exchange rate in two previous periods with the stable variables changes at 1%, leading to the adjustment of exported quantity at 2.3364 % in the similar manner. The result is corresponding to the hypothesis.

### Suggestion for the policy

#### 1. Hard disk drive

The analysis of the demand of Hard disk drive in U.S.A. showed the factors related to the cost and the exchange rate. The government should take a control over the currency rate and make it more stable. The demand of Hard disk drive is affected by the amount of tire manufacturing. The means to remain the potential is to control the quality of the products. Nowadays, Vietnam has increased the area of rubber trees shown on the value of RCA at 8.50%. The change of the market share is 65.05%. It is needed to hold the market share and expand it to control the price of the computers and parts in Thailand.

## **2. Power Supply**

The analysis of the demand suggested that the cost affected the demand from U.S.A. The currency rate should be stable in order to prevent the change of the demand of computers for tire industry in U.S.A. However, China is a strong competitor to Thailand. This country has lower costs in producing computers and parts, but their quality standard is not as good as Thailand's

## **3. Keyboard**

The analysis of the demand of the concentrated Keyboard to U.S.A. shows that the currency rate affects the demand. However, the high quality product from Thailand is still needed. Vietnam is a possible competitor for Thailand because RCA value shows the consistent and fast increase

### **Suggestion for the further study**

1. Other products should be brought to the study to find the suggestion for the plan and policy development in Thailand.
2. Other markets should be included besides the U.S.A. such as China, Japan, Hong Kong, France, Italy, and other European countries.
3. The selected statistics model should include appropriate theories and diagnostic checking to receive the most accurate result corresponding to econometrics. In addition, the analysis has to include all variables in the model to have statistics significance. T-Statistic and Correlogram (Chi – Square) should be included in the analysis.
4. The statistic model should include the trend of the product.
5. The study should be expanded to other areas such as economic status, politics and law, social issues, technology advancement, and competitive conditions.

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# APPLICATION OF CLICK-AND-MORTAR STRATEGY IN ONLINE SERVICE RECOVERY

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## ABSTRACT

*Service organizations are looking for new ways to compete in today's business world and e-commerce has been a powerful approach to provide service in the fast-changing industry. There are a large number of e-commerce sites on the web, many of them are pure e-businesses ("pure-play" companies) while others are a combination of bricks-and-mortar and online business—referred to as "click-and-mortar" businesses. When service failures occur in a pure-play company, customers typically receive online service recoveries. However, if the service provider is pursuing a click-and-mortar strategy, customers can have an option to receive service recoveries from an online store, from a physical location, or both. This paper attempts to examine customers' satisfaction with service recovery process when dealing with click-and-mortar companies compared to pure-play companies in order to determine whether a click-and-mortar strategy significantly enhances the customers' satisfaction with service recovery process.*

**Keywords:** e-commerce strategy, click-and-mortar strategy, service failure, service recovery.

## 1. INTRODUCTION

Service organizations are looking for new ways to compete in today's business world and e-commerce has been a powerful approach to provide service in the fast-changing industry. There are a large number of e-commerce sites on the web, many of them are pure e-business ("pure-play" companies) while many are the combination of bricks-and-mortar business and online business. When service failures occur in a pure-play company, customers will receive online service recoveries. However, if the service provider is pursuing click-and-mortar strategy, customers will have an option to receive service recoveries from an online store, from a physical location, or both. Therefore, click-and-mortar service providers are more likely to provide better service recoveries than pure-play companies once a service failure occurs. These click-and-mortar firms can leverage the best of the physical and virtual worlds and thus they can expect a significant competitive advantage over those service providers who pursue pure-play strategy.

This paper seeks to examine service recovery as well as service recovery expectation among e-commerce companies and investigate whether the click-and-mortar strategy can lead to higher service recovery expectation through perceived service quality and service guarantee, and whether the click-and-mortar strategy can lead to higher service recovery through tangible recovery effort, speed of recovery, and front line empowerment, compared to the pure-play strategy. Other variables such as differences in respondents' age, gender, and other demographic and background data will also be examined to determine the impact these variables have on service recovery and service recovery expectation.

## 2. LITERATURE REVIEW

### 2.1 Service Recovery Expectation and Service Recovery

Service recovery is defined as a systematic, planned process that return disappointed customers to a state of satisfaction after a service has failed to live up to customers' expectations (Carson and Carson, 1998). Service recovery processes are the activities that a company performs in order to address a customer complaint regarding a perceived service failure (Spreng, Harrell, and Mackoy, 1995).

When a service failure occurs, customers will expect the company's action to resolve the failure. Dissatisfied customers expect a good explanation of what has happened, an apology, that the service provider understands their situation and will make an effort in solving the problem (Andreassen, 2000). However, it is difficult to address what exactly customers expect from a service provider once a service

failure occurs. There are different expectations and dimensions of service recovery but many of them are based on anecdotal evidence rather than rigorous empirical testing, and even less is known about their relative importance to service customers (Boshoff et al., 1998).

## **2.2 Pure-play Strategy in Service Industry**

Pure-play strategy can add value into a company' service by providing a means for the company to interact with customers, to provide service inexpensively, to understand customers' information and preference so that the company can personalize its service for different customers, and to allow customers to communicate with one another in a virtual community. Customers' and firms' full interests can only be realized through the relationship between the two (Tzokas and Saren, 2001). Pure-play strategy can help e-commerce companies gain customer relationship by differentiating the service and create value from the interaction with their customers. Besides, the service provided by the web-based technology can provide up-to-date information for customers in a real-time fashion and therefore reduce the time and cost a customer had to spend if she received a similar service in the physical world. Additionally, pure-play companies can employ their e-commerce strategy to bypass the value chain and introduce and deliver product and service without the cost of complexity that exist in the physical world. These companies can integrate the information gathered from the value chain that delivers product and service and create new value for customers by serving a broader set of their needs (Rayport and Sviokla, 1995). By bypassing a distributor, pure-play companies can also create a long-term relationship with their customers.

An e-commerce company can attract and keep customers in its business by employing the Internet and web-based business that provides unique and crucial services to customers. A pure-play e-commerce company can even turn services to products. This idea of customer service can lead to information product or information service profit centers, and a pure-play company can develop proprietary information technology and services and turn them into dedicated information service providers or spin-offs in the market. For example, Yahoo! and similar search engines such as Lycos, Google, etc. are information service providers that have been turned into products on the Internet (Pant and Hsu, 1996).

## **2.3 Click-and-mortar Strategy in Service Industry**

When it comes to service industry, the majority of Internet users still take notice of the significant difficulties through online shopping. Therefore, click-and-mortar strategy is likely to be the emerging tool for success. Once e-commerce companies develop well-integrated click-and-mortar offerings and understand the difference in the processes for both physical and virtual worlds as well as the interplay between the two, these companies can create value in both worlds and hence better satisfy the needs of today's Internet consumers. The integration of bricks-and-mortar business and e-business can provide better product and service to customers. By keeping bricks-and-mortar business working closely with virtual business, a company can gain marketing opportunities by cross-promotion and shared information, make shopping easy and simple for customers, as well as create a new channel to increase customers' convenience. With click-and-mortar business, a company can reach customers in the way they want to be reached through a variety of channels and thus provide value that the physical or virtual business alone cannot.

Click-and-mortar companies can adapt their click-and-mortar strategy to their own particular market and their competitive situation by thinking carefully about which aspects of a business to integrate and which to keep distinct (Gulati and Garino, 2000). An appropriate operational integration will increase the chance for e-business success. Click-and-mortar companies should consider the strength of their distribution and information systems as well as their transferability to the Internet when making decisions about integrating operations (Gulati et al, 2000). This integration can result in significant cost saving, a more compelling and informative site, and a competitive advantage over pure-play competitors. Due to a fierce competition in today's business world, companies should attempt to create a new channel of business. Click-and-mortar companies can expand the product line on their web site in order to focus on a new

group of customers, and these companies can still take advantage of the existing brand and technical infrastructure from their physical business.

In addition to the aforementioned benefits, the physical stores that click-and-mortar companies have can also bring the companies buying power. Suppliers are more likely to send their shipment to a high-growth, innovative distributor than to a weakening brick-and-mortar store or to a pure-play that may account for only a small portion of their total sales (Gulati et al., 2000).

#### **2.4 Perceived Service Quality**

Perceived service quality and service guarantee can have an effect on service expectation. The higher the perceived service quality, the higher the service recovery expectations, and customers may allow businesses with a higher perceived service quality more opportunity to recover (Miller et al., 2000).

#### **2.5 Service Guarantee**

The existence of service guarantee can also increase service recovery expectation. If a failure occurs, customers will expect the company to meet its expressed guarantee stating the procedures which will be followed if that particular failure occurs (Miller et al., 2000).

#### **2.6 Tangible Recovery Effort**

Miller explains that tangible recovery efforts attempt to compensate for real and perceived damages (Miller et al., 2000). The main goal of tangible recovery effort is to offer fair reimbursement for the costs and inconveniences customers obtain from service failure. However, customers may stay loyal to the company after service failure occurs if the company provides value-added compensation which gives the customers more than the fair fix to make up for their bad experience (Miller et al., 2000).

#### **2.7 Speed of Recovery**

Speed of recovery is an important aspect in service recovery. A study by Boshoff (1997) has indicated that the longer the service recovery is delayed, the higher the level of atonement will be required (Boshoff, 1997). Similarly, Miller states in his study that a service failure is more likely to produce a successful outcome if the problem is solved in a timely manner (Miller et al., 2000). Miller also specifies that the ideal is to recognize and solve the problem before the customer becomes aware of it (Miller et al., 2000).

#### **2.8 Front Line Empowerment**

Front line empowerment happens when service employees have the knowledge and power to reimburse an unhappy customer for a service failure. It is essential that frontline employees be empowered to take responsibility for service recovery because, through their frequent contact with customers, frontline employees are likely to know customers' need better than anyone else (Boshoff, 1997). The customer is more likely to become satisfied and stay with the company if the front line empowerment is employed in the company (Miller et al., 2000).

### **3. RESEARCH QUESTIONS**

This research concentrates on the affects of two e-commerce strategies (pure-play and click-and-mortar) on service recovery expectation at the pre-recovery phase, as well as the affects the strategies have on service recovery on the immediate recovery phase. The affects are expected to come through mediating variables: perceived quality and service guarantee in the pre-recovery phase; and tangible recovery effort, speed of recovery, and front line empowerment in the immediate recovery phase.

The following research questions are developed in this study:

1. Does click-and-mortar strategy leads to higher customer expectations than pure-play strategy through perceived quality?
2. Does click-and-mortar strategy leads to higher customer expectations than pure-play strategy through service guarantee?
3. Does click-and-mortar strategy leads to better service recovery than pure-play strategy through tangible recovery effort?
4. Does click-and-mortar strategy leads to better service recovery than pure-play strategy through speed of recovery?
5. Does click-and-mortar strategy leads to better service recovery than pure-play strategy through front line empowerment?

#### 4. RESEARCH MODEL

The research model of this study is shown in Figure 1.

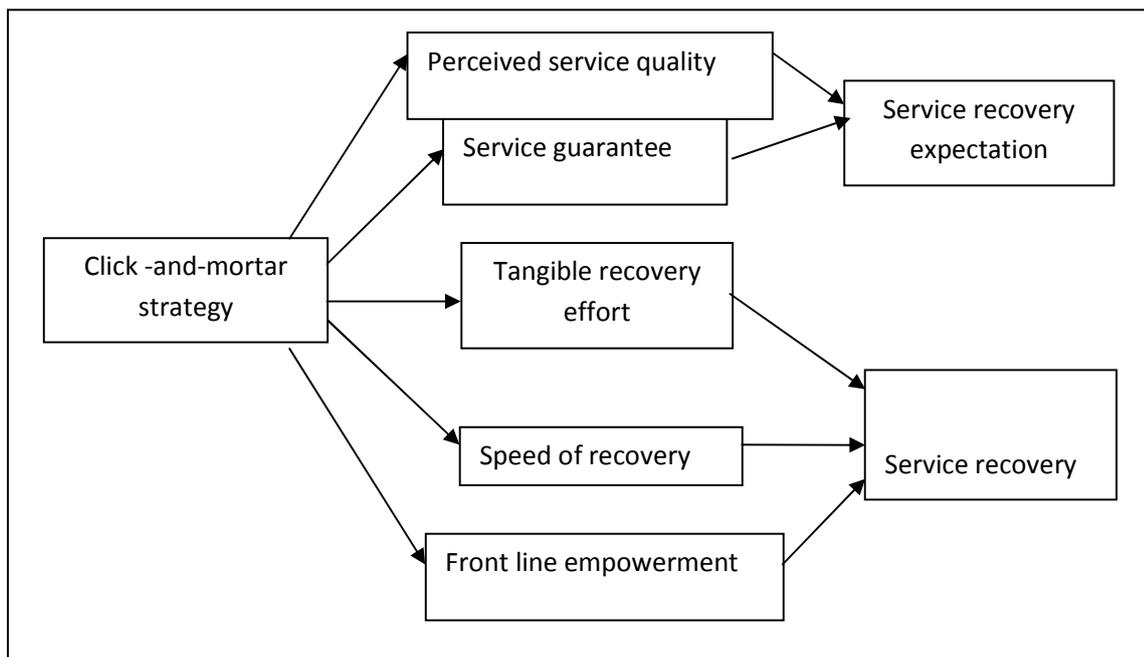


Figure 1. RESEARCH MODEL

#### 5. DISCUSSION AND CONCLUSION

This paper seeks to examine service recovery as well as service recovery expectation among e-commerce companies and investigate whether the click-and-mortar strategy can leads to higher service recovery expectation through perceived service quality and service guarantee, and whether the click-and-mortar strategy can leads to higher service recovery through tangible recovery effort, speed of recovery, and front line empowerment, compared to the pure-play strategy. To validate our research model, we plan to employ the research methodology based on an earlier study by Miller et al. (2000). Miller

conducted a survey using an adaptation of the critical incident technique (CIT) to determine whether successful recovery was related to the variables in their model. This study, however, focuses on the outcome of pure-play service recovery compared to that of click-and-mortar, and the projected outcomes are customers' satisfaction with service recovery process.

We expect the result of this study to answer the research questions, whether click-and-mortar strategy leads to higher customer expectations and service recovery compared to pure-play strategy. However, it is expected that click-and-mortar strategy will lead to higher customer expectations via perceived quality and service guarantee, as well as to a better service recovery via tangible recovery effort, speed of recovery, and front line empowerment.

Answers to these questions can inform researchers and practitioners how to further implement e-commerce strategy on service recovery and thus improve the effectiveness of service recovery. Service providers can then develop innovative ways to compete in the service industry, and academics can use this study to conduct revolutionary research in the future.

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## A STUDY ON THE CODIFICATION OF KNOWLEDGE WITH ORACLES FROM A KM PERSPECTIVE

Valerie Zhu

If you want to manage knowledge well, you must first manage Chinese characters well. (An anonymous paleographer)

"Knowledge is to realize and understand what you don't know" and "be cautious of the arrogance from ignorance"

### ABSTRACT

*Language is part of national culture, which ingrains (embeds) values system and life style of the people in which it is applied. Retrospect to human history, we once has the most important and the most ancient civilizations---Egypt, ancient Babylon, India and China. As time went by, the other three ancient civilizations have faded away; only Chinese civilization remained and maintained continuous development. The mystery lies in Chinese characters---the carrier and transmitter of language and human thoughts. As regards Chinese characters, the most important contribution will be conferred upon the oracles---the earliest Chinese characters which have been carved on animal bones and tortoise shells as early as in the Shang Dynasty. Thanks to great powerful life of Chinese characters, Chinese civilization has the opportunity to remain longevity. Though oracles have evolved with time later on, the essence and cream of Chinese characters carrying the footprint of life and mentality of people in China still can be "smelled". Adopting hermeneutic approach and based on large quantities of literature review, interviewing with concerning experts, this paper is attempting to dig out the secrets of how ancient Chinese people have managed knowledge under the real contexts of their life.*

**Keywords:** oracles, Chinese characters, evolution, knowledge management, heritage

### 1. INTRODUCTION

Going through the whole human history, there is one thing in common all over the world, that is, the appearance of the witch culture. The same is true of Chinese civilization. In the Shang Dynasty in Chinese history, in order to reach consensus in rational and fair way and be free from conflicts, whenever people want to make decisions, they would carve the events that they are intending to do on tortoise shells and animal bones. With the burning of the carvings, cracks turn up on the tortoise shells and animal bones and different cracks have different interpretations which imply what are the right things that people should do. This is the root cause why oracles exist. In ancient times in lots of countries, there once appeared pictographic characters, such as in Egypt, in China and some other South American countries (e.g. Mayan Culture). But all those have disappeared; only Chinese oracles remained. As written language, it has not only worked as powerful ties to link Chinese, but also laid a great influence upon neighboring countries like Japan, Korea, Singapore, etc. Chinese characters assured the cultural similarities with these neighboring countries. Being the language with the largest population who are using it, it worked in the past, is still working today and will still work in the future as the cultural heritage. It has demonstrated its great power to link people together. In this paper, the authors are intending to pierce the veil of Chinese oracles and are attempting to expose the implications and interpretations of Chinese characters in the perspective of knowledge management.

With the appearance of oracles from the Shang Dynasty, it has experienced rounds of evolutions along with the ups and downs of the development of Chinese civilization. No matter how the history alters, oracles have been evolving as well with the changing of societies. Since its turning up, oracles have become the earliest written language and pictographs have been seen as the earliest human written language in the world. At the same time in other parts of the world, such as Egyptian civilization and Mayan culture, there once also emerged pictographs as their languages, but all these have disappeared with the emergence of letter-driven languages, which is a completely different language system. Only Chinese written language maintained and developed and lasted for thousands of years. How can it be

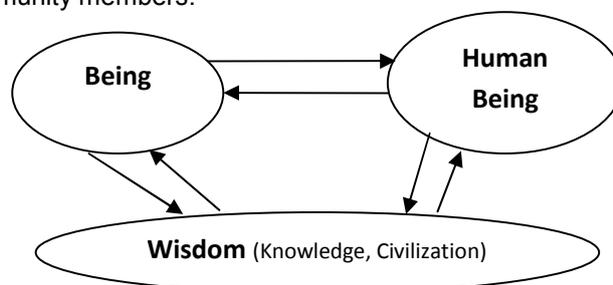
possible and why is it that? This paper aims at digging out the myths and mysteries of how Chinese language originated from oracles could achieve such longevity. Based on the investigation of this, the implications and interpretations of oracles pertinent to knowledge management have been exposed. Authors of the paper call special attentions from knowledge management researchers and practitioners on how to assure an effective and efficient knowledge management outcome after getting to know how ancient Chinese people manage knowledge from the perspective of the evolution of Chinese characters. Meanwhile, it is expected that Chinese characters as a language which accommodates the largest share of users in the world will have a day when it can also be designed into a computer-based operating system to facilitate the inputting and processing of the language, just like the role that English plays all over the world today.

The research of the creation and evolution of Chinese oracles should be seen from the lenses of the level of philosophy. Given that the latest philosophical ideas have been adopted, people must throw away the paradigm of already accepted mindset-- that is, to observe and understand things in an either "yes" or "no" simple pattern. The realistic and more comprehensive mindset when people look at things should be from the angles of a three dimensional panoramic perspective, which is the paradigm required by the systems logic)

## 2 THE VERY ORIGIN OF LANGUAGE CULTURE, AND CIVILIZATION

For the time being, many paleographers have been trying to pierce the veil of Chinese oracles. Quite a number of works have been released starting from Xu Shen's <*shuo wen jie zi*> (the interpretation of Chinese oracles) down through the emergence of <Kang'xi Grand Dictionary> in the Qing Dynasty.

The very Origin of knowledge (civilization, culture, knowledge): through the interaction of being, human being, human mind begins to have the concept and have the ability to creation knowledge according to the requirements of their lives. Therefore, knowledge (or rather civilization and culture) is the outcomes of interactivities between man and the environment in which he is living. In turn, that knowledge (or rather civilization and culture) will become a heritage in its unique community and lay influences upon the living styles of its community members.



**Fig. 1 3-D Perspective on the Origin of Chinese Oracles**

We can iterate that knowledge (culture or civilization) is the intelligent reflection of human beings to the objective being in which they are living. It is the blend of subjective world and objective world. The emergence of language has been largely depending on the demands of people who want to survive and as a result, the appearance of language is the intelligent reflection of human mind. Once such language has become popularly used in a certain domain of community, it will grow into culture which will be deep rooted in people's life style, habits and reactions towards people in other communities. When such culture hands down from one generation to another, it becomes the civilization of the people who once followed the rules and principles. Therefore, it is universally true that language and culture work as a brand name which distinguishes people in one culture from that in another. Based on the systematic logical mindset, authors of this paper propose that the emergence of language (can be extended to culture and civilization) is the outcomes of interactivities among the physical being in which human beings are living, human being, the proactive doer of the society and the intelligent reactions of human being towards the environment as being illustrated in figure 1.

## 2.1 Definition of Chinese characters

Why Chinese have been called *han ren*; Chinese culture, *han wen hua* and Chinese characters, *han zi*?

We define Chinese characters taking into account the following three elements:

- a. Chinese character has been called *han zi*;
- b. historical books, documents of cultural relics which were written in Chinese characters;
- c. the life styles of Chinese people go in conformity with the habits, disciplines, moral requirements which are written in those books and documents.

The first thing that we should know about Chinese characters is that Chinese characters have been evolving and developing at three levels:

Static model-----Dynamic model-----Mathematical model (computerized model)

## 2.2. Three elements that enabled the emergence of Chinese characters

The appearance of Chinese oracles has been originated from the following three elements: concept of categorization, driving forces for demand of Chinese characters and the coordination between hands and eyes, supplemented with writing materials and writing tools. These three elements work together to enable the appearance of Chinese oracles. Still due to these three basic elements, the fundamental features of Chinese oracles have been determined as can be generalized into the most typical three characteristics. That is,

- a. drawing lines to express meanings;
- b. only use the outline or framework to represent real objects;
- c. detailed exquisite depiction of a certain parts of the objects which are the most typical to the real objects.

## 2.3 The system for the creation of Chinese characters

Constrained by the carving materials (animal bones and tortoise shells), human manual work, and the limited resources, the creation of Chinese oracles at the very beginning has to follow the rule of thrifty and economy in creating oracles. This has also required Chinese oracles to accommodate the nature of being a semi-abstract, semi-solid. Specifically,

- a. Use image to express meanings (ideographs); use the least materials and efforts to create the as more characters as it could be;
- b. Based on the exquisite and fine observation of life experiences to create quasi-pictographs;
- c. Based on a single Chinese character through mutual explanation, many new characters will be created.

In reality, all the languages in the worlds at the very beginning are pictographic characters, like in Egypt, Greece, South American regions (such as Mayan Culture). The same is true of the letter-based language, like the most widely used language----English. The ancient people try to imitate the shape of how human beings are uttering a specific sound (like 48 international phonetics, later evolved into 26 letters in English) and note down the pronunciation based on the shapes of their mouth, (largely through onomatopoeia as well). When Chinese language combined the written form and pronunciation (phonetic form) in the Spring and Autumn Period, western language also adopted the pronunciation of their language and threw away the written form, thus they have entered the "Letter Language" period which is the very primitive demarcation of civilizations between the East and the West. From then on, such variances

## 3. ROOT, MORPHEMES AND AFFIXES OF CHINESE CHARACTERS

The roots of the oracles, (in Chinese called *zi zhu*) play a key role in the creation of Chinese oracles. There are about 300 roots of characters as can be evidenced from the unearthed oracles. Root of the characters is the smallest but meaningful symbol.

Morphemes of Chinese oracles, (in Chinese called *zi su*), it is the part in a character as an indicator to stand for the meaning of the oracles.

Affixes of Chinese oracles, (in Chinese called *zi zhui*), it is the part in a character to demonstrate the most typical and representative feature of that character. Affixes indicate the most typical feature of a character which resembles from real life.

Roots, morphemes and affixes have contributed Chinese oracles to amount to 3,500 characters from the unearthed oracle pieces, which is a great cultural heritage of Chinese civilization.

The secret how Chinese oracles have been created can be illustrated in figure 2.

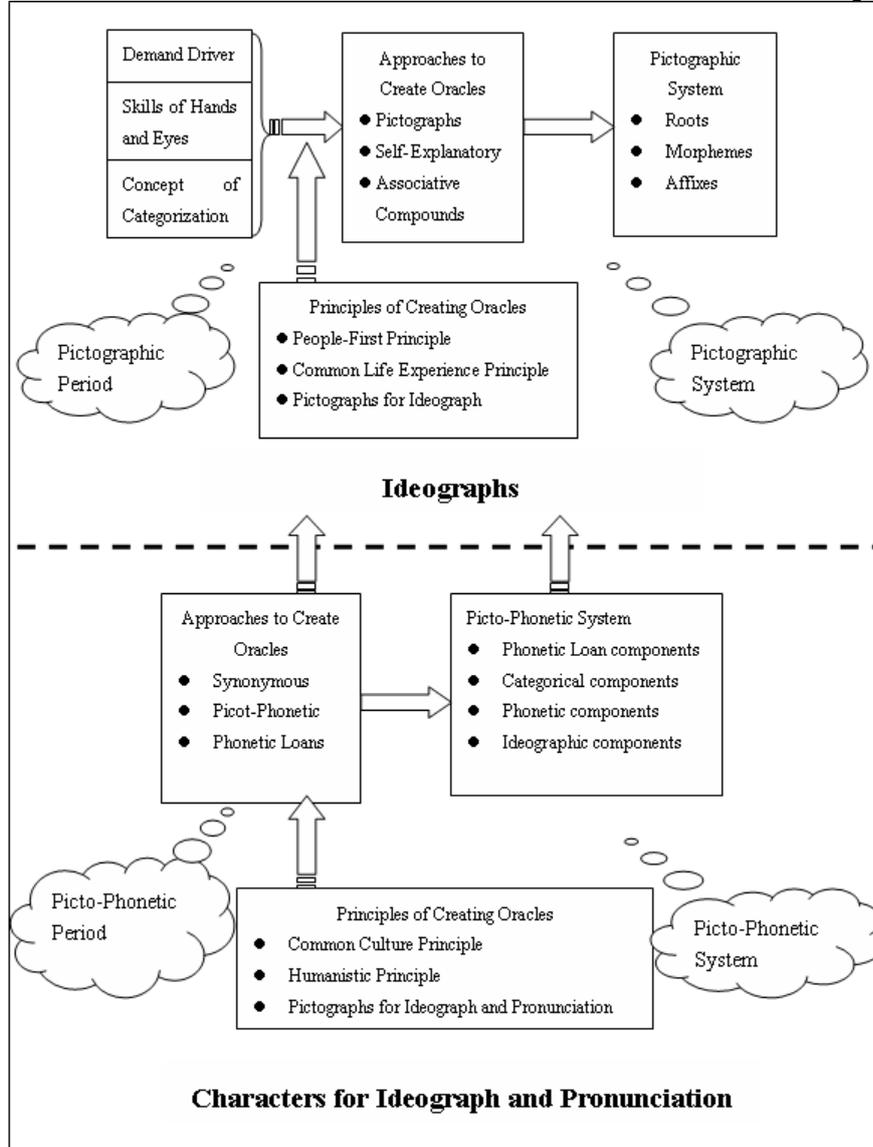


Fig. 2 Structure of Chinese Character System

#### 4. PRINCIPLES FOR CREATION OF CHINESE ORACLES

As early as from the Eastern Han Dynasty, many character addicts and paleographers have made unyielding efforts to explain and interpret Chinese oracles. From the unearthed oracle pieces, there are about 3500 Chinese characters that can be recognized and understood. Based on the identification and understanding of these oracles, from which three basic principles can be generalized.

To be specific, the principle of common experiences pertinent to living conditions; principle to use

pictographs to express meanings; as well as people-orientated principle. These three principles have been ingrained into the whole process in the creation of oracles. The people-oriented (people first principle) principle: when the oracles emerge in people's life, it takes people as the core, as people matter quite a lot in social life. Being absence of high-technological weapons and strongly restrained by limited resources for ancient people to survive, people are really of the utmost importance for the survival of a tribe. Without people, a tribe may be defeated or extinguished by another tribe.

To speak from the stems that play the key role in forming of Chinese character, they can be categorized into characters stems related to human body, which consists of almost every part of human body, such as posture, hand and arm, five senses, other body organs; character stems related to gender and sexual relationship, for instance the 12 Earthly Stems, reproduction organs of male and female, the sexual relations between male and female, as well as the reproduction organs of animals; character stems related to the Earth and the Heaven, for example, the Sun, the Moon, clouds, atmosphere, rainfall, stars, earth, stones, mountains, hills, fire, water, fountains, etc.; character stems derived from animals of all kinds that stayed with the ancestors at that time, for example, ox, sheep, dog, horse, pig, bird, tiger, wolf, elephant, scorpions, turtles, fish, etc., character stems derived from plants of varieties, such as wood, grass, bamboo, wheat, melons, rice, etc.; character stems derived from tools, like 10 Heavenly Branches, weapons, utensils, containers, etc.; character stems derived from real life experiences, such as house, transportation, clothes, food utensils, as well as living habits and culture, like sacrificing, cemetery, etc.; the other type of character stems have been originated from abstract mentality but partially pertinent to real life experiences, such as the stems that indicate upward, downward, etc.

To present a direct and vivid picture of how ancient Chinese people create oracles and how they express their thoughts and ideologies in creating oracles, hereinafter, some examples will be demonstrated with sense-making pictures. Taking the 12 Earthly Stems and 10 Heavenly Branches for example:

In Chinese characters, the Earthly Stems symbolize the ancestors worship for the reproduction of human beings.

**Zi**, the first of the Earthly Stem ( in Chinese character for “兒”、“兒” 和“囟”子), which imitates the disclosure of a baby's head in oracle. it is the disseminated from another Chinese character si “巳”. According to some experts, lots of animals, including human beings, when the mother delivers a baby, normally the head will come out first. The creation of this oracle has indicated that ancestors have a very careful observation of the baby birth process. As the first stem in the Earthly Stems, it also implies the ancestor's worship towards reproduction. Zi today has been used in many compound word clusters like er zi (son), nv zi (daughter), xiao zi (son with filial son), etc.

Chou ( in Chinese 丑), in oracle, it is a pictograph, imitating the clasped hand of the baby when it was born. With the appearance of the head, clasped hands also turned up, while the baby was crying, he or she normally moves his or her hands towards his or her mouth. When we observe the baby birth today, we still can find the same things, which implied the very vivid and careful observation ability of the ancient people.

Yin (in Chinese 寅) it is a self-explanatory character. In oracles, it is a vivid depiction of two hands carrying the placenta which is still connected with umbilicord. Umbilicord leads the placenta out of the mother's womb and thus implies the meaning of waiting for someone to turn up in a respectful manner; it also implies the meaning of moving forward.

Mao, (卯 in Chinese), the fourth place in the Earthly Stems, which originated from the co-existence of baby and placenta. It also implies that the delivery of baby is already finished and baby and the mother are separated as two independent parts, which marks the accomplishment of the baby delivery. This has also been used to demonstrate time, referring to the period from 5 o'clock to 7 o'clock.

Chen (in Chinese for 辰), made up of two roots of the character into a self-explanatory Chinese character,

meaning using stone knife to cut the umbilical cord. “Chen”, later became a very popular radical component and appeared in many Chinese characters.

Si, (in Chinese, 巳), originated from the real life situation that newly born baby has been wrapped inside a blanket and only head remained outside.

Wu (in Chinese, 午), resembling the umbilical cord which has been covered on the belly button waiting to be laid off automatically after 7 or 10 days since the baby was born. Many Chinese characters have been originated from umbilical cord which indicates that ancient people stress more on reproduction of human beings. As at that time, whether a tribe will survive and prosper or not depends largely on how many people they have.

Wei (in Chinese, 未), originated from the fact that after one month old, the baby is able to wave his or her arms and legs. It also implies that future is unknown to the baby. Later, in Chinese character, wei has become an important radical component for pronunciation.

Shen, (in Chinese, 申), originated from the female reproduction organ, meaning only female can deliver babies and makes the generation move on, which implies the extension of the blood ties. Later, shen has also become a very popular radical component for pronunciation.

You (in Chinese, 酉), originated from the shape of wine utensil, implying the celebration of the birth of female baby, as female baby is the hope for the next and next generation. Later, it has become a widely used radical component in Chinese characters.

Xu, (in Chinese character for 戌), originated from the shape of an axe. This implies the celebration of the birth of a male baby as when the male baby is growing up, they will be able to use weapons and fight against their enemies. You and xu have expressed the different responsibilities of male and female and ancestors have the same attitudes towards male baby and female baby. Later, it also becomes a widely used radical component in many characters.

Hai, (in Chinese character for 亥), resembling the image of a naked boy, emphasizing the existence of the reproduction organ. The creation of the character hai, (亥) expressed the ancestors' best wishes for the newly born baby boy to grow up smoothly and defend for the tribes. Later, it becomes a widely used radical component in many Chinese characters.

In Summary, these 12 Earthly Stems have vividly described the whole process of baby birth. It is the ancestors' wishes for the boom of the population, which is the essential requirement for the prosperity of tribes at that time. Therefore, the creation of 12 Earthly Stems is the reflection of the living conditions of ancient people. It indicates the holy and sacred worship of ancestors for reproduction of population. Apart from the expression of birth culture, reproduction culture, gender culture, these 12 Earthly Stems have also been used to indicate 12 time zones, each stands for 2 hours.

#### The 10 Heavenly Branches

Jia, the first place of the 10 Heavenly Branches (in Chinese character for 甲), it is a lifelike depiction of shield. It is also the name of the specific tribe called jia. This tribe is specialized in making shields. Later, jia has been used to imply “No. 1”, “the best”.

Yi, the second of the 10 Heavenly Branches, (in Chinese character for 乙), which originated from the shape of the rope. It is also the name of the specific tribe “yi”, which is specialized in braiding ropes. The tribes “jia” and “yi” have made a strategic alliance as “jia” have to use ropes made by “yi” to tie up its shields.

Bing, the third place in the 10 Heavenly Branches(in Chinese character for 丙). It is originated from the shape of the wood slice which is used to make fire. Ancient people make hole into wood and then get fire.

Ding, the fourth in the 10 Heavenly Branches(in Chinese character for 丁), which originated from the shape of bronze ingot and as the name of the tribe, this tribe is specialized in making bronze ingots. Bing and ding tribes are formed into a strategic alliance.

Wu, the fifth place in the 10 Heavenly Branches( in Chinese character for 戊), which is a self-explanatory character, which resembles the manner in which an axe in the hand of a man. It is the reflection of the ancient fighting, meaning men with axes in their hand waving up and down. While they are fighting the enemies, they also utter noises in the pronunciation of “wu” to show their brevity and frighten the enemies.

Ji, the sixth of the 10 Heavenly Branches (in Chinese character for 己), it is the depiction of tying up things by ropes in a sense-making way. It has become a popular root appeared in many Chinese characters. Characters with such a radical component have the meaning of being tied up or wrapped.

Geng, the seventh of the 10 Heavenly Branches (in Chinese character for 庚), designated from the action of boring the holes continuously. Later, it has become a widely used basic root of Chinese characters. Characters with such radical components have the meaning of hole, emptiness, etc.

Xin, the eighth of the 10 Heavenly Branches (in Chinese character for 辛), it is the resembling of an ancient tool for criminal punishment, normally wearing around the criminal's necks. It is also the indication of carpenter's tool for making holes into wood. Later, it has become a widely used basic root for creating Chinese characters.

Ren, the ninth place of the 10 Heavenly Branches, (in Chinese character for 壬、工), it resembles the shape of bone needles appeared in Neolithic Age, meaning going through with sharp tips. Later, it has been widely used in lots of Chinese characters to imply going through; passing from one side to the other thoroughly.

Kui, the tenth of the 10 Heavenly Branches ( in Chinese character for 癸). It is a kind of tool in tribal society for people to hunter birds and other animals, similar to boomerang. Later it has become a popular radical component, taking the meaning of revolving quickly and wide open.

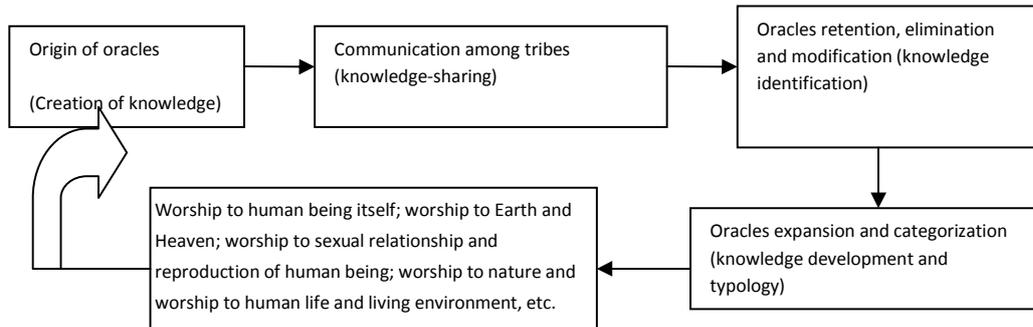
In summary, these 10 Heavenly Branches are the most important ten tribes in the Shang Dynasty, each specializing in making a certain kinds of tools they need for survival at that dreadful living environment. In order to raise efficiency and integrate limited resources, every two tribes have united as a strategic alliance to enhance their competitive advantages.

12 Earthly Stems and 10 Heavenly Branches played an important role in people's life and such influence has been maintaining and extending even to date. 24 hours a day has been demonstrated by the 12 Earthly Stems, each stem stands for two hours. In addition, the combination of 12 Earthly Stems and 10 Heavenly Branches have been used to represent 60 years as a cycle. Moreover, the 12 animals (rat, ox, tiger, rabbit, dragon, snake, horse, sheep, monkey, chicken, dog, pig), representing 12 Earthly Stems have been used to symbolize the year in which a person is born. Such tradition has been handed down from generation to generation for more than 5,000 years.

## **5. PRIMITIVE MODEL OF KNOWLEDGE MANAGEMENT IMPLIED FROM THE CREATION OF ORACLES:**

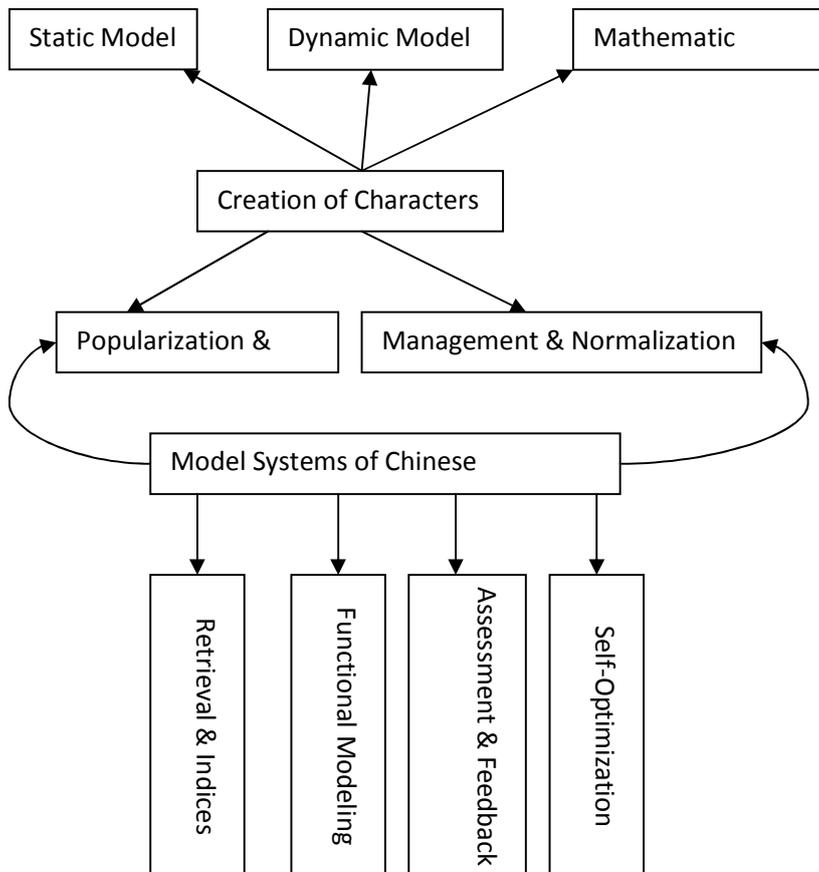
Looking through the essence and cream of how ancestors have created oracles, it is observable and self-explanatory that the creation of oracles (knowledge creation) is deeply rooted in real life experiences; the fundamental purpose for the creation of oracles is to meet the basic requirement of communication and achieving consensus (why knowledge is necessary? The preliminary purpose for the existence of

knowledge---usefulness); the most essential consideration for people to share knowledge is building trust. Oracles first of all have been identified and used among members of the same tribes; then flow to the other tribes which have marriage ties with each other, like the tribes which formulated strategic alliances (as explained in the 10 Heavenly Branches); furthermore, the profound abundance of information and enriched life experiences have pushed the development of oracles; the evolution of oracles also follows the rule of “survival of the fittest”. Oracles which have been unanimously accepted and in conformity with life experiences have been retained and developed, but those that are far beyond the life experiences and rarely used in life have been eliminated automatically. The flow of characters has also enlarged the communication scope and scale which in turn helps the development of oracles.



**Fig. 3 co-relation between creation oracles and knowledge management**

The Network of the Creation and Evolution of Chinese characters can be illustrated as below:



## **6. CONCLUSIONS AND IMPLICATIONS IN KNOWLEDGE MANAGEMENT**

As early as some 4,000 years ago, ancient Chinese people began to create language which is called oracles. The initial purpose for them to create oracles is only for the facilitation of communication and makes decisions when there are no consensuses. They may never have expected that their creation can lay a great influence upon their descendents today in knowledge era. Their unconscious and conscious actions have become an invaluable heritage for people today. The systematic arrangement of creation, collection, compilation, storage and development of knowledge has led profound thoughts on us. Additionally, government support and involvement in the whole process of knowledge management is another must for assuring the success of Chinese characters. There are still a lot that have to be done to dig out from the treasure of Chinese characters. This paper only works as a pioneer and vanguard to arouse people's attention and interest in doing further research into the essence and creams of Chinese culture. Let the culture heritage shine as brightly as it can to guide the way forward for us contemporaries.

## **ACKNOWLEDGEMENT**

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# TRANSFORMATIONAL LEADERSHIP AND WORK COMMITMENT: A LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

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## ABSTRACT

The main goal of this study is to develop a framework of how transformational leadership affects on work commitment. A theoretical framework based on a stimulus – response mechanism for understanding how a leader can influence followers to make self-sacrifices, to commit to difficult objectives, and to achieve much more than initially expected. This study develops an integrated model of the stimulus – response mechanism chain, as well as six research propositions. The model will help managers to effectively improve their performance via their transformational leadership behavior. Better understanding of these constructs is anticipated to contribute to development of organizational knowledge cultures characterized by high levels of work commitment.

This paper contributes to the theoretical conceptualization of transformational leadership – work commitment via learning climate and learning enthusiasm in an modern organizational behavior field study. The context of the study is the transformational leadership of enterprise wide CEO leaders to facilitate communication, coordination, and collaboration for enabling organizational performance. The originality value of this paper is to develop a conceptual model which explains the relationships among transformational leadership, learning climate, learning enthusiasm and work commitment.

**Keywords:** Transformational leadership (TL), Learning climate (LC), Learning enthusiasm (LE), Work commitment (COM)

## 1. INTRODUCTION

The pace of change confronting organizations today has resulted in calls for more adaptive flexible leadership. Adaptive leaders work more effectively in rapidly changing environments by helping to make sense of the challenges confronted both leaders and followers and then appropriately responding to those challenges. Adaptive leaders work with their followers to generate creative solutions to complex problems, while also developing them to handle a broader range of leadership responsibilities (Bennis, 2001). Bass, 1985 labeled the type of adaptive leadership described above transformational. Transformational leaders concentrate their efforts on longer term goals; value and emphasize developing a vision and inspiring followers to pursue the vision; change or align systems to accommodate their vision rather than work within existing systems; and coach followers to take on greater responsibility for both their own and others' development (Howell & Avolio, 1993). Transformational leadership is the process of influencing major changes in the attitudes and assumptions of organization members and building commitment for the organization's mission or objectives (Yukl, 1999). Effective leaders in this context have been found to create a climate for innovation and learning, often through transformational leadership. Specifically, they provide visions of successful innovation, intellectual stimulation to enhance creativity, feelings of involvement and a willingness to disagree, and resources that allow for needed autonomy and freedom to innovate (Elkins & Keller, 2003). Based on the results of this, it appears that leadership style maybe the imperfectly mobile asset that is linked to follower's commitment. Mata et al. (1995) states that if an organization has an asset that is imperfectly mobile, then the organization will have a sustained competitive advantage.

Although the literature on transformational leadership has grown up rapidly over the past 20 years, only a handful of studies have examined how a leader can influence followers to make self-sacrifices, commit to difficult objectives, and achieve much more than was initially expected. However, these notions have only recently been refined in the literature of organization behavior (Ilies, Judge, & Wagner, 2006). We focus on their conceptual standpoint, the influence that transformational leaders have on the behavioral

component of followers' motivation through affective and cognitive processes. It follows that by influencing followers' emotional experiences and their affective states, transformational leaders can induce changes in followers' behavior--influencing them to exert effort on tasks that are important for the organization. Transformational leadership influences learning climate, learning enthusiasm, and work commitment. Learning climate and learning enthusiasm, in turn, affect work commitment, which then leads to behavioral outcomes. (See Figure 1). To the best of our knowledge, no previous study has examined these mediated influences of transformational leadership on work commitment. To the extent that such indirect paths are identified, the impact of transformational leadership on work commitment might be stronger than previously thought.

The main goal of this study is to develop a framework of the relationships among transformational leadership, learning climate, learning enthusiasm and work commitment. In sum, what is needed is a richer conceptualization of the transformational leadership – to – work commitment relationship. We conclude with a discussion about the implications of this model and directions for future research.

## 2. THEORETICAL BACKGROUND AND PROPOSITIONS DEVELOPMENT

This section briefly outlines some of the background literature. Evidence supporting the integration of stimulus - response process, transformational leadership, learning climate, learning enthusiasm, and work commitment constructs into a single research model came from a variety of research studies. In this section the definitions of these variables are discussed first, and subsequently the relationships between variables in the current study are proposed. Thus, our conceptual model presents the relationship among transformational leadership and work commitment, as shown in Figure 1.

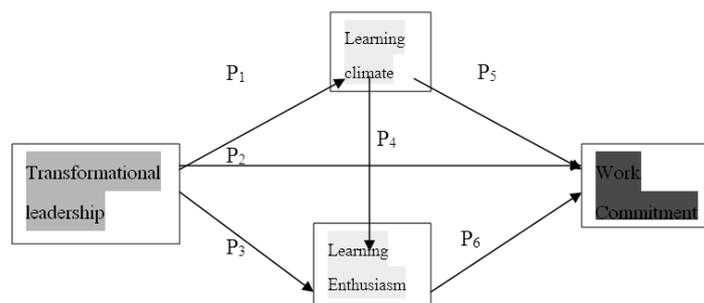


Figure 1. A framework linking transformational leadership to work commitment.

### 2.1 Transformational leadership

Researchers define leadership in terms of group process, traits, behaviors, or as an instrument of goal achievement (Bass, 1990). Leadership definitions include social influence and the leader's role is setting a purpose or vision of change (e.g., Bass, 1985; Yukl, 1999). Yukl (1999) defined leadership as a process of influencing and teaching others to understand why and how certain activities and goals need to be accomplished. As such, it constitutes a process of facilitating individual and collective efforts to learn and accomplish shared goals in organizations.

The traditional paradigm incorporates an implicit unidirectional stimulus - response mechanism to explain the reaction of leaders and their subordinates to management actions (Arndt, 1979). The dyadic exchange paradigm focuses on transactional relations between leaders and their subordinates. The outcome of this relationship depends on followers' commitment or the effectiveness of leaders to motivate their subordinates to commit.

The term charisma (Greek for 'gift') has a distinguished history. The first theory formally linking charisma to leadership was House's (1977), which argues that leaders promote organizational change by articulating a clear vision and creating a strong bond with followers that leads to acceptance of the vision. According to Burns (1978), transformational leaders motivate followers by appealing to common ideals and moral values. Bass (1985) extended Burns's concept further, and argued that transformational leadership is comprised of four distinct dimensions: (1) Idealized influence (charisma) can be defined as serving as a charismatic role model to followers. This dimension, often simply referred to as "charisma," is the most prototypic and often the single most important dimension. (2) Inspirational motivation involves articulation of a clear, appealing, and inspiring vision to followers. Although vision is conceptually distinct from charisma, research has found that inspirational motivation is highly correlated with idealized influence; they are often combined in practice (Bass, 1997). (3) Intellectual stimulation involves stimulating follower creativity by questioning assumptions and challenging the status quo. As Bass (1985) noted, "By the transformational leader's intellectual stimulation, we mean the arousal and change in followers of problem awareness and problem solving, of thought and imagination, and of beliefs and values" (p. 99). (4) Individualized consideration is similar to the consideration dimension from the Ohio State-Michigan studies (Yukl, 1999) and involves attending to and supporting the individual needs of followers. Unlike the traditional consideration factor, however, individualized consideration focuses more on a follower's development and less on participative decision making (Bass, 1997).

Transformational or charismatic leadership is associated with perceptions of effective leadership (Shamir, Zakay, Breinin, & Popper, 1998) and objective measures of group (Sosik, Avolio, & Kahai, 1997), work unit (Avolio, Howell, & Sosik, 1999), and organizational performance. From Ilies, Judge, and Wagner, 2006 conceptual standpoint, we focus on the influence that transformational leaders have on the behavioral component of followers' motivation through affective and cognitive processes. It follows that by influencing followers' emotional experiences and their affective states, transformational leaders can induce changes in followers' behavior--influencing them to exert effort on tasks that are important for the organization.

## **2.2 Learning climate**

Climate is defined as the recurring patterns of behavior, attitudes and feeling that characterize life in the organization. At the individual level of analysis, the concept is called psychological climate (Isksen, 2007). At this level, the concept of climate refers to the intrapersonal perception of the patterns of behavior, attitudes and feelings as experienced by the individual. When aggregated, the concept is called work unit or organizational climate. These are the objectively shared perceptions that characterize life within a defined work unit or in the large organization. Climate is distinct from culture in that it is more observable at a surface level within the organization and more amenable to change and improvement efforts. Organizational climate is an intervening variable that affects individual and organizational performance due to its modifying effect on organizational and psychological processes. The climate is influenced by many factors within the organization and, in turn, affects organizational and psychological processes include learning, individual problem solving, creating, motivating and committing. These components exert a direct influence on the performance and outcomes in individuals, working groups and the organization. Leaders create the working climate by using a variety of levers within the organization. For example, when leaders create and communicate mission and strategy, they can influence the climate. Restructuring is one lever we have witnessed that is utilized very often to create change in the way people interact. By providing clear task requirements for projects and tasks, they can set the tone for the kind of change required.

## **2.3 Learning enthusiasm**

Enthusiasm or follower effort was influenced by motivational forces factors. According to the classical model of work motivation (e.g., Campbell & Prichard, 1976): transformational leaders influence followers' motivation through affective and cognitive processes. The leader-member exchange (LMX) relationship is important in the learning process in that it has the potential to engender trust and follower perceptions of leader support (Sparrowe & Liden, 2005; Graen & Uhl Bien, 1995). Perceptions of support and trust allow followers to feel more autonomy and a level of freedom to challenge the status quo and pursue projects with risks and unknown outcomes (Tierney, Farmer, & Graen, 1999). The LMX relationship also

helps followers feel that they will receive credit for their contributions and ideas (Sparrowe & Liden, 1997). Thus, this situation will bring to follower enthusiasm.

## **2.4 Work commitment**

According to Porter et al., (1974) work commitment is "the strength of an individual's identification with and involvement in a particular organization" (p. 604). Beyond its effect on the setting of challenging learning and performance goals, strategic leadership also should lead to goal commitment. Visions not only inspire individuals to commit to a new idea but also serve as a course of action (Conger & Kanungo, 1998). When leaders communicate their ideas in a vision, their ideas tend to be embedded in a context and are hence more appealing for the collective of people within that context (Van Knippenberg & Hogg, 2003). As Zaccaro and Banks (2001) argue, one way that vision may lead to effectiveness is that the actions of the visionary leader galvanize support for the vision. In House's (1977) theory, charismatic leaders articulate a vision, but also foster ties with followers that lead to support of the vision. Because goal commitment results from a rational appraisal that involves whether the goal can be achieved and transformational leaders help clarify contingencies between follower effort and outcomes (House & Shamir, 1993), visionary leadership should result in heightened goal commitment.

## **2.5 Relationships between the variables**

Research studies have established the antecedent, mediating, and consequent relationships among transformational leadership, learning climate, learning enthusiasm, and work commitment. Six propositions were then proposed.

### **2.5.1 The influence of transformational leadership on learning climate**

One challenging role of transformational leadership is the providing of a schema for followers that centers on the vision and leads to subordinate goals (Wofford and Goodwin, 1994). Visions provide followers with a cognitive road map that structures their activities; this cognitive road map leads to the setting of challenging goals. Northouse (1997, p. 132) notes that transformational leaders "communicate high performance expectations for followers." Thus, there is reason to believe a vision should lead to the setting of challenging goals for followers. Specifically, challenging goals lead to the greatest performance. Recent research has filled in important gaps in our understanding of how goals influence individuals in situations or tasks of greater complexity. Specifically, Kanfer, 1996; Kanfer & Ackerman, 1989, in her discussion of the resource allocation model, found that on complex tasks, initially emphasizing learning results in better skill acquisition, such that the individual is more adept at the task and is able to reach a more objectively difficult performance goal later in the performance of the task.

Charismatic leadership could reasonably evoke these higher level learning tendencies in followers, such that their abilities will be further developed and they will subsequently demonstrate greater performance on tasks. This climate encouragement to initially seek a learning orientation could be due to the feelings of safety and inspiration that the charismatic leader evokes in followers. If a follower feels inspired to greatness by the leader, he would be more inclined to implement a learning approach and thus build skills and competencies that would enable greater subsequent performance. Accordingly, as abilities are increased, the follower will experience a concomitant increase in self-efficacy, further encouraging the establishment of challenging, yet now-reachable goals. This kind of climate supports the development, assimilation and utilization of new and different approaches, practices and learning climate. Indeed, Northouse (1997) argues that transformational leadership leads to heightened goals on the part of followers. In sum, the above evidence would suggest the first proposition as below:

***Proposition 1: Transformational leadership positively influences learning climate.***

### **2.5.2 The influence of transformational leadership on followers' commitment**

Indeed, Kirkpatrick et al. (1996) hypothesized a link between visionary leadership and goal commitment, so transformational leadership is a positive driver of organizational commitment. By providing team spirit, it can enhance followers' pride, which, in turn, should increase their commitment to the firm. When followers committed, they will behave as organizational citizenship behavior (OCB), such as, motivation

to learn and transfer their knowledge to their co-workers, work hard, increase job involvement, etc.,. There is considerable evidence that transformational leadership is effective. Most survey studies using the MLQ and similar questionnaires find that transformational leadership is positively related to indicators of leadership effectiveness such as subordinate satisfaction, motivation, and performance (Bass, 1997). In a meta-analytical review of 39 studies using the MLQ, Lowe, Kroeck, and Sivasubramaniam (1996) found that key elements of transformational leadership correlated positively with subordinate satisfaction and performance. Dyer and Chu (2000) emphasized the importance of salespeople's socialization, which can enhance workers' understanding of their role definition and provide an understanding about the tasks to be performed. In combination, these benefits should enhance employees' task – specific self – esteem and help resolve conflicting job demands. Role definition should increase job involvement and organizational commitment (Dyer and Chu, 2000). Descriptive studies based on interviews and observation also find that transformational leadership is effective in a variety of different situations (e.g., Bennis & Nanus, 1985; Tichy & Devanna, 1986). A well – developed transformational leader can serve as initiation and socialization mechanisms for the workforce, thereby enhancing organizational commitment directly. As reviewed, the following proposition is proposed as below:

***Proposition 2: Transformational leadership positively influences employees' commitment.***

### **2.5.3 The influence of transformational leadership and learning climate on learning enthusiasm**

Enthusiasm or follower effort was influenced by motivational forces factors, such as transformational leadership and learning climate. These forces will initiate work – related behavior to achieve vision that leads to follower goals (Kirkpatrick & Locke, 1996). The broad neurobehavioral systems that regulate motivation are believed to have distinct affective, cognitive, biological, and behavioral components. Gray's (1981) reinforcement sensitivity theory is linked to basic emotion and mood theories by the assumption that people experiencing positive emotions or affect are motivated to perform approach behaviors, and people experiencing negative emotions are predisposed to avoidance behaviors.

Watson (2000, p. 24) considers the subcomponents of the motivational systems (affective, cognitive, biological, and behavioral) to naturally exist in synchrony with one another and that "altering the organism's standing on any one component produces corresponding changes in all the others." It follows that by influencing followers' emotional experiences and their affective states, transformational leaders can induce changes in followers' behavior--influencing them to exert effort on tasks that are important for the organization. In the broadest terms, with respect to affective influence processes on follower motivation, we propose that the emotions and affective states of leaders themselves influence the emotions and affect followers which, in turn, influence followers' enthusiasm. Accordingly, we posit the propositions as follows:

***Proposition 3: Transformational leadership positively influences learning enthusiasm.***

***Proposition 4: Learning climate positively influences learning enthusiasm.***

### **2.5.4 The influence of learning climate on work commitment**

Leader charisma, a special quality enables the leader to mobilize and sustain activity within an organization through specific personal actions combined with perceived personal characteristics'. With their personal qualities, charismatic leaders can have profound and extraordinary effects on followers and achieve high levels of follower motivation, respect, trust, and loyalty (Bass and Avolio, 1994). Leader charisma helps firms overcome their internal pressures and facilitates changes through envisioning, energizing, and enabling followers.

First, charismatic leaders create an exciting, identifiable, and desirable picture of the future that the change will bring about. This picture provides followers with a vehicle through which they can develop commitment, as well as a psychological focal point for their hopes and aspirations. Second, charismatic leaders energize organizational members to change the status quo by expressing personal excitement and confidence, stressing a strong sense of the collective mission, making personal sacrifices, and avoiding the use of power for personal gain. Third, charismatic leaders enable followers to act in the face of challenging goals through support and encouragement. Consequently, employees pursue those goals with more enthusiasm and have more confidence to undertake the changes (Bass and Avolio, 1994). In

these ways, charismatic leaders can lead their firms to break down internal barriers and inertia and undertake changes more easily. For example, individuals who work for companies like 3M, which promote individual ideas as a source for learning, may be more motivated to engage in entrepreneurial intuition than employees who work for firms that do not pay attention to individuals' intuitions. Previous research suggests that a climate that allows diversity of perspectives and skills (Ford, 1996), or one in which employees feel psychologically safe to come up with ideas without being blamed, to support creativity and commitment.

A recent study (Ron, Lipshitz, & Popper, 2006) found that Israeli Air Force commanders used after-action-reviews to convey their intents and expectations from pilots and crew members. Learning from such reviews is possible because leaders support a climate that tolerates mistakes, which are later utilized for future learning. Therefore, we proposed our fifth proposition as below.

***Proposition 5: Learning climate positively influences work commitment.***

### **2.5.5 The influence of learning enthusiasm on work commitment**

A wide range of factors has been found to affect followers' organizational commitment. Of these, top managers' leadership style has been identified as being one of the most, if not the most, important. Employees who have commitment may be willing to expend extra effort on behalf of the organization when needed. Furthermore, these employees may be more motivated and thereby more productive. Leaders serve primarily as orchestrates, rather than directly impacting learning through follower's behaviors.

At the individual level, the role of leaders is to foster the developmental readiness of individual followers, thereby enhancing their potential to contribute to organizational learning. These followers, in turn, can then serve as "knowledge catalysts" of learning within and between social networks. Moreover, leaders themselves may promote the diffusion of knowledge between knowledge catalysts by affecting the structure and functioning of knowledge networks. Yukl, 1999 suggests that leaders facilitating and guiding new ideas within a network. To date, no one has tested the effects of learning enthusiasm upon work commitment. Thus, we predict as hypothesized below:

***Proposition 6: Learning enthusiasm positively influences work commitment.***

## **4. CONCLUSION AND FUTURE DIRECTIONS FOR RESERCH**

This paper pays greater attention to the integration of research in leadership and commitment which can further our understanding of the effects of charismatic and transformational leadership. We have put forward a model that specifies the mechanisms through which the influence of transformational leadership on employee commitment is realized. This study focused on two key issues; 1. the proposed causal effects of transformational leadership as antecedents of learning climate and learning enthusiasm on work commitment; 2.the causal ordering among learning climate and learning enthusiasm on work commitment. The main goal of this study was to develop the relationships between transformational leadership and work commitment when mediated by learning climate and learning enthusiasm.

Although the relation between each of the 3 components, transformational leadership, commitment and success have been studied in prior research. This study contributes by extending another two components, learning climate and learning enthusiasm in the model. We develop a model that uses a multi – construct framework to examine the role play by transformational leadership.

The proposed model contributes management research and practice in two major ways. First, it contributes to research in organizations by stimulating further research to delineate the processes by which leaders exert commitment influence on their followers. We hope that such an approach will also be of benefit to the literature on commitment by convincing commitment scholars to take a broader view of work commitment and study other organizational factors that have distal influences on employee

commitment. We have proposed a direct relationship between positive emotions and self-efficacy but other relationships between affective and cognitive constructs are likely to exist. For example, goals are thought to raise arousal and positive emotions should increase self-set goal difficulty. Thus, given the strong "energetic arousal" component of positive emotions, positive emotions and self-set goals may be related positively in a bi-directional manner.

Second, the model contributes to the OB (Organization Behavior) literature by identifying the relationship among learning climate and learning enthusiasm and work commitment (e.g. attitudes and behaviors). The model and the research emanating from it will further the understanding of intervening processes between social exchange process factor and task and social outcomes.

So far, most research in the area of organization behavior has focused on the effects of work commitment on employee's behavior but little research focuses the antecedent of the work commitment. Better understanding of these constructs is anticipated to contribute to development of organizational learning culture characterized by high levels of social exchange and climate, the two factors deemed critical for the sustainable competitive advantage.

In conclusion, we believe that the field is now in a position to more fully explore the macro perspective. Such research will have the added benefit of bringing together micro and macro perspectives in an attempt to better understand the effects of transformational leadership on organizations. We also believe that the time has come for additional multidisciplinary research and theory development in the field of leadership. This article is an attempt to move in that direction by providing specific theoretical linkages with regard to transformational charismatic leadership as applied in the organizational behavior and strategic management domains.

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# THE EFFECTS OF ETHICAL RESTRICTION AND COMPETITIVE PRESSURE ON KNOWLEDGE SHARING

Xiang Liu

## ABSTRACT:

*Knowledge sharing has been identified as a best practice by CPA firms to improve audit quality, effectiveness and efficiency. Thus, it is important for both practitioners and academicians to understand factors that hinder knowledge sharing inside CPA firms. We examine the effects of ethical restriction and competitive pressure on knowledge sharing intention inside CPA firms. By controlling for other potential factors that may also impact knowledge sharing intention, the experimental design isolates out the effects of these two factors.*

**Keywords:** Knowledge sharing, ethics, AICPA code of professional conduct, pressure effect

## 1. INTRODUCTION

The purpose of this study is to advance the understanding of two factors (i.e. ethical restriction and competitive pressure) that may hinder knowledge sharing in public accounting firms. Desouza (2003) points out that the biggest obstacle to effective knowledge management is not implementing a cutting-edge IT solution, but getting people to talk and share their know-how. Unless members of the organization are motivated to share, no IT solution can deliver desired goals. This explains the importance of studying knowledge sharing intentions in our study. Further, Vera-Munoz et al. (2006) identify two reasons why this topic is important. First, the current regulatory environment and new audit standards have increased pressure on CPA firms to improve quality, effectiveness and efficiency of the audit process. Second, knowledge and expertise are unevenly distributed among the members of the audit team. Knowledge sharing among employees can leverage the competitive advantage of a professional services firm by spreading otherwise proprietary knowledge among its members. However, studies in organizational learning and psychology consistently show that knowledge sharing within organizations is often limited (Szulanski 2000 1994; Nonaka and Takeuchi 1995; Von Hippel 1994). This paper focuses on two factors that may help explain why knowledge sharing within the firm may be limited. We use a laboratory experiment to control for other confounding factors that also influence knowledge sharing.

Prior literature examines factors such as information technology, informal interactions among auditors, incentives and reward systems, and leadership style that may influence the knowledge sharing behaviors of public accountants. However, no investigation has been conducted to evaluate the effects of ethical restriction and competitive pressure. Unlike other industries that are not subject to a set of strict professional code of conduct, CPA firms are highly susceptible to ethical issues that cause significant litigation risk. Therefore the effect of ethical restriction is more pronounced for the public accounting than most other fields. In addition, policy makers have expressed concern about competitive pressure in public accounting, at both the engagement team and accounting firm levels that may influence individual and firm attitude and performance (Commission on Auditors' Responsibilities, 1978). Competitive pressure at the individual or engagement team level is likely to hinder knowledge sharing within CPA firms. Therefore, both ethical restriction and competitive pressure are significant factors in knowledge sharing that should be examined, particularly in an accounting environment. This study is important in that the findings will provide implications for public accounting firms and academic researchers who wish to understand and enhance knowledge sharing within CPA firms. The enhanced knowledge sharing among auditors will increase audit quality, effectiveness and efficiency.

This study is the first one that examines the effects of both ethical restriction and competitive pressure on knowledge sharing within CPA firms. Prior literature overlooks the effects of these two factors that are important for CPA firms due to its industry characteristics.

## 2. THEORY AND HYPOTHESIS DEVELOPMENT

### 2.1 Knowledge Sharing

Over the past decade, knowledge sharing has been identified as a best practice by many corporations such as CIGNA, Dow Chemical, Hewlett-Packard, Shell, and Xerox (Vera\_Munoz et al. 2006). It has also attracted attention from the professional practice literature (Sharp 2003; Kepczyk 2000; Stimpson 1999; Bukowitz and Petrash 1997; Bank 1996; Stewart 1997). Advocates view knowledge sharing among employees as a source of competitive advantage, corporate value, and economic growth (Bennet and Bennet 2003; Liebowitz and Chen 2002; Mullin 1996; Villadsen 1995). Drucker et al. (1997) identified knowledge sharing at all levels of an organization as a top priority for firms to succeed in today's competitive environment.

In public accounting, the regulatory environment (e.g. Sarbanes-Oxley Act of 2002) and auditing standards (e.g. the Public Accounting Oversight Board's Auditing Standard No. 2) have encouraged CPA firms to enhance the quality, effectiveness, and efficiency of the audit process (Vera-Munoz et al. 2006). Particularly, the AICPA's Auditing Standards Board issued Statement on Auditing Standards No. 99, *Consideration of Fraud in a Financial Statement Audit*, which requires a higher level of fraud detection effort of auditors. In response to the competitive environment, many CPA firms adopted active knowledge management practices. For example, KPMG realized a need to shift away from rewarding individual performance to a culture of knowledge sharing within the firm (Alavi 1997; Cockrell 2007). In addition to KPMG, the other Big 4 audit firms have knowledge sharing systems in place (Chow et al. 2000).

Prior research explores factors that impact knowledge sharing behavior of professional accountants. Vera-Munoz et al. (2006) performed a theoretical exploration of selected factors that may enhance or hinder knowledge sharing in public accounting firms. Based on prior research in accounting, organizational learning, psychology, and knowledge management, they proposed that information technology, formal and informal interactions among auditors, and reward system in encouraging knowledge sharing. The purpose of their study is to provide recommendations for CPA firms to promote knowledge sharing.

Chow et al. (2000) empirically examine the interaction effects of national culture and contextual factors on employees' tendency to share knowledge with coworkers in a laboratory experiment. Subjects were 104 U.S. managers and 38 Chinese managers enrolled in an EMBA program. By randomly assigning subjects to different case scenarios, the experiment was conducted during their class sessions. Chow et al. found that openness of knowledge sharing was related to cultural differences in collectivism (i.e. the relative emphasis on self versus collective interests) as well as whether knowledge sharing involved a conflict between self and collective interests. Chinese managers shared significantly less knowledge with coworkers outside the group than U.S. managers.

Other studies investigate the use of incentives in knowledge sharing. Using both interns and Certified Management Accountants, Cockrell (2007) investigates the motivational effects of incentives and knowledge culture on accountants' and other professionals' knowledge sharing behavior within professional services firms using a survey instrument. Based on two theories, i.e. economic and psychology-based theories, he measures the effects of quantity and quality of motivation on useful, useless, and harmful knowledge sharing behavior. Cockrell finds that monetary incentives increase the strength of motivation to share professional knowledge, which in turn increases useful knowledge sharing, but at a cost of also increasing harmful knowledge sharing. However, increasing organizational support for self-determination increases the quality of motivation to share knowledge, which also increases useful knowledge sharing, but without the harmful side-effect. Taylor (2006), in a laboratory experiment, examines whether financial incentives increase knowledge sharing in a computer-mediated environment. Thirty-six accounting students were randomly assigned to three types of incentives (i.e. group, piece-rate, or tournament) in a task to detect errors in financial statements, with access to an online chat room. She finds that the group financial incentives inspired more knowledge sharing than did either tournament or piece-rate incentives.

In addition, leadership style and organizational culture (such as justice systems) are found to influence knowledge sharing. Chen and Barnes (2006) investigate the influence of three different leadership behaviors on knowledge sharing activities in professional service firms in Taiwan and the United States. In a survey of 16 Big 4 accounting firm branch offices in Taiwan and 135 branch offices of top 20 accounting firms listed in Bowman's (2003) top 100 accounting/consulting firms in the U.S., they find that transformational leadership behaviors are a significant predictor of internal knowledge sharing. Contingent reward leadership behaviors are significantly and positively associated with both internal and external knowledge sharing with customers. Laissez-fair leadership behavior is significantly and negatively correlated with external knowledge sharing. In a survey of professionals from various industries, Lin (2007) finds that distributive justice, procedural justice, and cooperativeness influence tacit knowledge sharing indirectly via two mediators (i.e. organizational commitment and trust in co-workers). There is a positive association between justice and cooperativeness and knowledge sharing willingness.

Using a survey of professional employees in an internationally operating engineering company, Matzler et al. (2008) find there is significant correlation between personality traits and knowledge sharing within teams after controlling for other factors that influence knowledge sharing in the structural equation model. All three measures of personality traits, i.e. agreeableness, conscientiousness and openness are highly correlated to knowledge sharing.

In a survey of employees from three companies in the US, Siemsen et al. (2008) find that knowledge sharing is a function of motivation, opportunity and ability and their interactions. They also find that that knowledge sharing is resulted from the constraint of these three variables.

Using survey data collected from a utility company and a software company in the US, Renzl (2006) finds that both interpersonal trust and trust in management influence knowledge sharing. Specifically, they find that fear of losing one's unique value and knowledge documentation have a mediating effect on the relationship between trust in management and knowledge sharing. Trust in management increases knowledge sharing through reducing fear of losing one's unique value and improving willingness to document knowledge.

Chow and Chan (2008) investigate the effect of social capital (i.e. social network, social trust and shared goals) on organizational knowledge sharing. Surveying 190 managers randomly selected from the directory of D&D Key Decision Makers in Hong Kong 2004/2005, they find that a social network and shared goals significantly contribute to a person's volition to share knowledge, and directly contribute to the perceived social pressure of the organization. The social trust however shows no direct effect on the attitude and subjective norm of sharing knowledge. They conducted the study using SEM.

Hooff and Weenen (2004) examine the influence of organizational commitment and the use of computer-mediated communication (CMC) on knowledge sharing. Using surveys of two consulting firms, they find that CMC use is an antecedent of organizational commitment, and that such commitment, in turn, influences the willingness to both donate and collect knowledge.

Cabrera et al. (2006) examine some of the psychological, organizational and system-related variables that may determine individual engagement in intra-organizational knowledge sharing. Results from a survey of 372 employees from a large multinational IT company shows that self-efficacy, openness to experience, perceived support from colleagues and supervisors and, to a lesser extent, organizational commitment systems, and perceptions of rewards associated with sharing knowledge management systems, and perceptions of rewards associated with sharing knowledge, significantly predicted self-reports of participation in knowledge exchange.

Lin (2007) investigates important determinants of knowledge sharing, including co-worker congruence, received task interdependence, organizational commitment and participative decision-making, using exchange ideology as a moderator in the study. In a two-step procedure of structural equation modeling of data collected from employees across different industries, he finds that the influence of co-worker congruence on knowledge sharing is stronger for individuals with low exchange ideology than for those

with high exchange ideology, while the influence of received task interdependence on knowledge sharing is stronger for individuals high exchange ideology than for those with low exchange ideology. The influence of participative decision-making on knowledge sharing is stronger for individuals with high exchange ideology than for those with low exchange ideology.

Liao (2006) builds a nested model to test the relationship between learning organization, knowledge sharing behavior, and firm innovation. Using data from 254 employees, he finds that open-mindedness, shared vision and trust have positive effects on both knowledge sharing behavior and firm innovation. Commitment to learning does not have significant influence on knowledge sharing but communication does.

Huang et al. (2008) examine knowledge sharing intentions in Chinese setting given the unique social and cultural contexts. Surveying 200 second year MBA students from a university located in Eastern China, they find that loss of knowledge power is an important factor that negatively affects knowledge sharing. They also find that image, sense of self-worth and anticipated extrinsic reward have a significant effect on attitude while anticipated reciprocal relationships do not. They find that attitudes have a positive effect on knowledge sharing intention while subjective norm and intentions do not. Finally, they find that *guanxi* orientation, a unique Chinese social factor, played an important role in knowledge sharing intention.

Liu and Liu (2008) investigate the relationship between employees' knowledge acquisition sources and the patterns of knowledge sharing behavior. Using sample of R&D professionals from high-tech companies in Taiwan, they find that most employees prefer to acquire knowledge form, and share knowledge with, their team members. Knowledge acquired via participation of professional communities facilitates the sharing of R&D knowledge within the organization.

Choi et al. (2008) examine how socio-technical enablers can affect knowledge sharing intention and behavior and explore practical implications for knowledge sharing. Surveying firms through the Knowledge Management Research Center at Korea Advanced Institute of Science and Technology, they find that social enablers such as trust and reward mechanism are more important than technical support in isolation for facilitating knowledge sharing.

In our study, we focus on the effects of two unexamined factors by prior research, i.e. ethical restriction and competitive pressure, on knowledge sharing intention of auditors.

## **2.2 Ethical Restriction**

Because the public accounting profession is heavily regulated by a professional code of conduct, conflicts of interests often arise. Certain types of knowledge sharing may benefit the organization but violate the professional code of conduct. For example, sharing client-specific information, trade secrets, firm strategies, and other "forbidden" knowledge can violate the professional code of conduct, firm policy or societal expectations (Cockrell 2007). Under extreme cases, such knowledge sharing may result in huge litigation risk to the CPA firms.

In public accounting, auditors are required to abide by codes of conduct issued by a variety of organizations, including those promulgated by the AICPA, their state licensing boards, and their firms, as well as additional regulations on auditor conduct issued by the Securities and Exchange Commission (SEC) and the Public Companies Accounting Oversight Board (PCAOB). In particular, Section 301 of the AICPA Code of Professional Conduct mandates that "a member in public practice shall not disclose any confidential client information without the specific consent of the client". Confidentiality has ethical, professional and moral responsibilities associated with it (Karon 1992). In a self-governed industry, a public accounting firm's most important asset is its reputation. If clients believed that a public accounting firm was disclosing their confidential information, they could lose confidence in the firm. The consequences could range from significant, such as loss of the client or significant legal costs, to devastating, including regulatory sanction or even bankruptcy. Thus, it is of crucial importance to guard the confidentiality of client information.

An example of the potential consequences from disclosing client confidential information is the court case, *Wagenheim v. Alexander Grant & Co. (AG)* (*Wagenheim v. Alexander Grant & Company* 1983). In the conduct of their audit, AG discovered that one of its clients, Consolidated Data Services (CDS), was in financial difficulty. The court found that AG breached their duty of client confidentiality by warning other clients against conducting business with CDS. Regardless of intent, AG shared confidential client information that may have benefited their other clients (and perhaps even AG) but harmed CDS (Cockrell 2007). In this case, client confidential information was shared with other clients and that information was leaked out of the firm. Suppose, however, that the information had not been leaked outside of the firm? Is it legal or ethical to share client confidential information with other employees outside the engagement team, if the information is safeguarded within firm boundaries? Some may feel this is a grey area in that client confidential information sharing within the firm can hardly be detected, and therefore litigated, by outsiders. What are an auditor's obligations and where should their loyalties lie? Suppose, for example, that a large client is on the brink of bankruptcy, as in the *Wagenheim v. Alexander Grant & Co.* case. Suppose further that this company was a major supplier to several other clients, all of whom are owed sums that are material to their balance sheets and critical to their cash flows. With this scenario, not only are those clients at risk, but the firm may also be at risk if they do not detect and properly address this risk. Thus, sharing the information within the firm could be an act of protecting one's own firm, rather than a concern for the clients who could be harmed by the bankruptcy of their supplier.

However, according to Section 301, except for the purposes of investigative / disciplinary subpoena or summons and hierarchical audit performance review, client confidential information should not be shared with any other employees' inside the audit firm.<sup>1</sup> Although sharing confidential information about a client inside the firm is hard to detect, it is, nonetheless, a violation of professional conduct. As firms advocate knowledge sharing, they should still emphasize compliance with the professional code of conduct at the same time. The result of this is that the ethical restriction may hinder knowledge sharing of client sensitive information.

Thus

**H1: Auditors are less likely to share client confidential information than general audit expertise information with their peers.**

### 2.3 Competitive Pressure

Prior literature examines extensively how pressures can affect accounting professionals' attitudes and performance (Lord and DeZoort 2001; Hackenbrack and Nelson 1996; Tsui and Gul 1996; Ashton 1990; Smith and Everly 1990). The types of pressure unique or important to accountants include feedback, social influence (e.g. compliance, conformity and obedience), workload, time budgets, accountability and justification. By investigating the effect of these pressures on accountants, researchers are interested in improving and maximizing the quality of professional judgment and decision behavior in an effort to minimize the costs of dysfunctional behavior as it relates to task performance (Solomon and Brown 1992). Although in some situations pressure improves performance, the risks associated with pressure-induced dysfunctional behavior cannot be ignored. In modeling the effect of various pressures, DeZoort and Lord (1997) identify competitive pressure among peer accountants as a potential pressure in public accounting. "In an accounting context, competitive pressure is defined as the pressure to succeed professionally or financially either as an individual, engagement team, or accounting firm relative to other individuals, teams, or firms." (DeZoort and Lord 1997, p.61) For example, staff accountants may compete in their efforts to finish a specific audit area. This competition may conceivably result in either increased or decreased audit effectiveness or efficiency (DeZoort and Lord 1997).

Competitive pressure between individual auditors or engagement teams may hinder knowledge sharing in two ways. First, auditors hoard information due to the fear that they will help their competitors and lose advantage. Rhode (1978) expresses concerns about this deleterious effect of individual competition in the accounting environment. Using a mathematical model, Wang (2004) argues that hoarding information is a

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<sup>1</sup> This has also been verified in practice by audit partners from several large firms.

way of maximizing individual self-interest when there is a conflict of interests. Second, the Webberian view thinks that people gain power by hoarding and keeping their knowledge and intention secret (Bennet and Bennet 2003). For example, Liu (2008) conducts a survey study to examine the relationship between Machiavellianism and knowledge sharing willingness. The results show that Machiavellianism orientation is significantly and negatively correlated with knowledge sharing willingness. We expect that the existence of acute competitive pressure will cause auditors to be less likely to share information when there is no ethical restriction. Nevertheless, when there are ethical restriction, competitive pressure is not a significant factor in determining sharing intention.

Thus,

***H2: When there is no ethical restriction on sharing, auditors facing strong competitive pressure are less likely to share information with a peer than those facing weak competitive pressure.***

***H3: When there is ethical restriction on sharing, competitive pressure is not a significant factor explaining knowledge sharing intention.***

### **3. RESEARCH DESIGN**

The experiment uses a 2x2 between-subjects design (see Figure 1). One independent variable is ethical restriction that is manipulated at two levels – ethical vs. unethical. The other independent variable is competitive pressure that is manipulated at two levels – strong vs. weak. The dependent variable is auditors' self-reported intention to share information. Subjects from public accounting firms are randomly assigned to each of the four groups. A 2x2 design allows the examination of the interaction effect between the two independent variables. ANOVA procedure will be performed to test the significance of the hypotheses.

#### **3.1 Case Development**

We developed a case scenario to manipulate the effect of ethical restriction and competitive pressure on knowledge sharing. To manipulate ethical pressure, we present half of the participants with the opportunity to share confidential client information, which if used by the auditor of another client, could protect the firm from litigation. The other half of the participants read the same case, modified to present the opportunity to share an audit tool developed on an engagement, which, if used by the auditor of another client, could protect the firm from litigation. We manipulate competitive pressure by varying the relationship between the audit partners on the two engagements. In the low competitive pressure scenario, the partner in possession of the knowledge is senior to the other, and not concerned regarding evaluative pressure. In the high pressure scenario, the partner in possession of the knowledge is a peer to the other, and is concerned that they will be compared in the selection of the next senior partner in the firm.

The proprietary knowledge possessed by one partner in the case would help their colleague to maximize audit performance. However, knowledge sharing in the "unethical" manipulation violates the confidentiality rules of professional conduct, while knowledge sharing in "ethical" manipulation does not violate any ethical rules. We hypothesize that ethical restriction is a significant and negative factor impacting knowledge sharing within public accounting firms. If auditors in practice are aware of the ethical restriction and abide by professional code of conduct, they will be less likely to share information in "unethical" scenario than in the "ethical" one. Similarly, knowledge sharing in the "competitive" manipulation may harm the auditor, while it should have no impact on them in the "noncompetitive" manipulation.

#### **3.2 Experimental Procedures**

The intention to share knowledge is measured as the participants' likelihood to share the relevant information with Mr. Soles, on a scale from 0% to 100%. In order to mitigate the social desirability bias of using self-reported measure, participants are told that their responses will be kept anonymous and confidential and there is no right or wrong answer. The experiment will be conducted during CPA firms' training sessions. Post-experimental questionnaires are administered to collect demographic information

and to do manipulation check. In addition, a recall test is used to test whether participants are aware of the confidentiality rule under AICPA professional code of conduct section 301.

**FIGURE 1**  
**The 2x2 Research Design**

Dependent variable is self-reported likelihood to share knowledge between 0% - 100%.  
Independent variables are ethical restriction and competitive pressure.

	Strong	Weak
Ethical	Cell 1	Cell 2
Unethical	Cell 3	Cell 4

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## INSTRUMENT

Competitive pressure at two levels, i.e. strong vs. weak, is manipulated by the first paragraph in the case:  
Weak/Strong: You are a senior audit manager in a large, multi-office public accounting firm. The reward and promotion system of your firm depends heavily on comparing individual and team performance in terms of audit quality. Among your many colleagues is Steve Soles, a fellow senior manager who [is not a rival of yours in terms of performance evaluation/is a significant rival of yours in regard to promotion to partner in the coming year]. You are quite certain that your performance [will not/will] be compared to Soles' performance in the year-end evaluations and you [are not/are] concerned about how you will compare. (Adapted from Wang 2004)

Ethicality is manipulated by the second paragraph in the case:

Unethical: Among your firm's many public audit clients are Company A and Company B, both in the telecommunications industry. There is a pre-existing business relationship between these two clients - Company A is a major supplier of Company B. You are the manager in charge of the audit for Company A, and Steve Soles is the manager in charge of the audit for Company B. During the audit, you find that company A is in financial difficulty. The news has not been revealed to the public yet. You are pretty sure that Mr. Soles and his team who are auditing Company B are unaware of this information. With this information, they would test and restate the accounts receivable balance of Company B and have a more accurate audit. (Adapted from Gunz and McCutcheon 1991)

Ethical: Among your firm's many public audit clients are Company A and Company B, both in the telecommunications industry. There is a pre-existing business relationship between these two clients - Company A is a major supplier of Company B. You are the manager in charge of the audit for Company A, and Steve Soles is the manager in charge of the audit for Company B. During the audit, you develop a comprehensive checklist to aid the valuation of accounts receivables for telecommunications companies. The checklist has not been shared with the other partners in the firm yet. You are pretty sure that Mr. Soles and his team who are auditing Company B do not have such a checklist. With this information, they would test and restate the accounts receivable balance of Company B and have a more accurate audit.

Manipulation check questions:

1. Which audit are you in charge of?
  - a. Company A
  - b. Company B
2. My audit client is the company that is in financial trouble.
  - a. False
  - b. True
3. The audit firm will promote any partners with enough tenure.
  - a. False
  - b. True

Please answer the following questions and rate your answer between 0-100%:

1. How likely would you be to share this information?
2. How likely would others in your firm be to share this information?
3. How likely would those in other firms be to share this information?
4. How appropriate is it to share this information?

# ENTERPRISE 2.0 ENABLED SOCIAL NETWORK IMPACT—A REVIEW OF SOCIAL NETWORK THEORY IN INFORMATION ECONOMY

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## ABSTRACT

*Organizations have long recognized the importance of social capital and aggressively looked for ways to upgrade and identify the business value embedded in their organizations. With the increasing investment of social network technology in corporate practice, managers and scholars are interested to identify the economic impact of implementing or upgrading the internal Enterprise 2.0 technology (McAfee 2006) based professional social network. New technology innovation and application such as searching, tagging, messaging, sharing are emerged as the key function for corporate IT usage. However, questions 1) What types of task could be more beneficial from Enterprise 2.0 enabled network? 2) How knowledge intensive firms generate value from Enterprise 2.0? 3) How managers could leverage Enterprise 2.0 function to affects his Business unit and individuals productivity output? The purpose of this paper has been developed to understand the status of using social network theory to study the emerging industrial phenomenon. Both classical conceptual ideas from social network theory and traditional quantitative empirical approach have been reviewed and summarized. It servers as the basis for future scholars to leverage social network analysis as the new tool to analyze and understand relevant issues in information economy.*

**Keywords:** Enterprise 2.0, Social network theory, IT-enabled organization

## 1. INTRODUCTION

Enterprise 2.0 concept (McAfee 2006) is coined in 2006, since then the long-held dream of enabling knowledge workers to realize the “intangible organizational capital” (Brynjolfsson, Hitt et al. 2002; Brynjolfsson and Saunders 2010) suddenly appears promising. With the boom of ubiquitous web2.0 technology penetrates the internet service, featured as intensive web application to facilitate the interactive information sharing, user-customized design and open collaboration at a global scale. Practitioners are increasingly interested to apply the web2.0 technology into corporate life. By running the same technology through organization’s intranets and extranets, Enterprise 2.0 is invented since then to help unveil the black box of intangible organizational capital. The fundamental difference of Enterprise 2.0 from traditional IT is that Enterprise 2.0 tends to encourage user to create organizational practice and simultaneously adjusting itself for the evolving organizational structure prior to providing any deterministic structure as traditional IT solution delivered. In an ideal Enterprise 2.0 communities, structures are imposed to be as flat as possible, by doing so, the empowered individuals are encouraged to heighten their ability to act autonomously and increase the information free flow, knowledge creating and further strengthen know-how learning mechanism. More specifically, SLATES: search, links, authoring, tagging, extensions, signals are regarded as the main function to realize Enterprise 2.0 (McAfee 2009). As email access gives researcher the opportunity to solicit real-time email communication data. The more powerful Enterprise 2.0 platform empower researcher to record detailed business intelligence from individuals’ and groups’ communication, collaboration and knowledge exchange. Such IT technology could eliminate bias introduced through survey methods.

The enhanced social, collaboration function in Enterprise 2.0 platform will also impact on multitasking, as we have already experienced, multitasking—taking on multiple projects simultaneously across industries and geographies dominates current economy development (Park 1996). However, how Enterprise 2.0 enabled multitasking actually affects productivity is less understood. Previously, the research around multitasking has generated conflict research outcome. Some claim that multitasking creates distraction and cognitive switching cost that reduce worker’s intelligence quotient and affects their ability to complete tasks efficiently (Rosen 2008). While others contend multitasking actually help workers share and incorporate similar knowledge and experience across different projects, in turn expedite the decision

making process and realize complementarities across organization silos (Lindbeck and Snower 2000). My future study under the Enterprise 2.0 context will help identify the balance and trade-off in multitasking and productivity management.

Following the task level empirical research that established the relationship between the structural properties of individuals' or groups' network position and various types of economic performance (Aral, Brynjolfsson et al. 2007; Aral, Brynjolfsson et al. 2007; Aral and Van Alstyne 2007; Wu, Lin et al. 2009). This paper and my future work will extend this stream of research. I will analyze the performance variation in the firm's internal Enterprise 2.0 platform practice from chosen period of time. In summary, this study explores the relationship between information, technology and information business unit productivity, using detailed empirical evidence to examine the mechanism of IT use, information/knowledge seeking behavior affect business unit performance output. Such studies not only sheds light on the study of relationship between IT usage and productivity improvement, but also contribute to the understanding of underlying mechanisms of social media, Enterprise 2.0 practice in a networked organization setting.

## **2. IT AND INFORMATION ECONOMY**

A growing body of literature links the positive relationship between IT and productivity gains. Empirical evidence is demonstrated at country (Dewan and Kraemer 2000), industry (Jorgenson and Stiroh 2000), and firm (Brynjolfsson and Hitt 1996) levels. This study aims to present new evidence on the links between business unit performance and social capital generated from Enterprise 2.0 enabled social networks from task level analysis. As the Enterprise 2.0 (McAfee 2006), social media software becomes the mainstream enterprise software (Bughin and Chui 2010), studying how information worker and knowledge-intensive business unit generate value in the networked organization is becoming increasingly important. Previous studies in the field of Management of Information System focused on the impact of information system and technology for traditional industries, including manufacturing, insurance, airlines, etc (Copeland and McKenney 1988; Weill 1992; Zaheer and Venkatraman 1994; Gefen and Ragowsky 2005).

Collectively, an interesting phenomenon of increasing IT investment with productivity slowdown lead to the academic debate around the "productivity paradox" issue (Brynjolfsson 1993; Brynjolfsson and Hitt 1996). The Nobel Laureate economist Robert Solow's observation "we see computers everywhere except the productivity statistics" reflect the concern dominate the industry at that time. In subsequent years, four explanations for the paradox has been identified and extensively studied (Brynjolfsson and Yang 1996; Bulkley and Van Alstyne 2004) 1) Lags due to learning and adjustment, this explanation focus on the fact that IT investment can take several years to show up because of the complexity of adoption. In general the benefits for IT infrastructure investment can be large, but often are indirect and not immediate. 2) Redistribution and dissipation of profits. This explanation argues that IT maybe beneficial to one firm while unproductive to others. For example, IT based marketing can be extremely productive for marketing firms while adding nothing to the total output (Baily and Chakrabarti 1988). 3) Mismanagement of information and technology, this argument state that the lack of explicit measures of the value of information makes it vulnerable to make decision for management. Last and the core of the explanation are the 4) Mis-measurement of output and inputs, the traditional measure of the relationship between inputs and outputs fail to account for non-traditional sources of value. Traditional measuring of the production outcome is calculated by physical goods, leaving the research gap to model and measure the productivity gains from white-collar worker. As matter of fact, IT innovation affect information worker to search for, analyze and share information, as information work represents a growing share of the GDP, in the US alone, more than 70% of labor force is regarded as information worker, and counted over 60% of value added in US economy (Apte and Nath 2007). My future study will make contribution to better understand how information technology affects information work productivity at the level of business units. In the meanwhile, address the concern how information worker make decision, perform task and deliver information based products and services

### 3 SOCIAL NETWORK ANALYSIS APPROACH

In the past few decades, social network theorists have paid particular attention to the relationship between social structure and economic opportunity (Granovetter 1973; Granovetter 1985; Walker, Kogut et al. 1997; Burt 2000). Concepts as weak ties, social capital and network properties have been introduced to explain the intangible capital generated in organization practice. In particular, an enormous amount of attention on theoretical and empirical debate is around the network diversity (Burt 1992), which a network is low in cohesion and structural equivalence and rich in structural holes. Such network is positively correlated to better performance and in turn, creating a competitive advantage for individuals and units. For example, bankers with structurally diverse networks are more likely to be recognized as top performers (Burt 2000), Burt attributes such performance variation to actors' ability to gather and access diverse sources of information from broader social groups. Thus, a structurally diverse network is assumed to confer information benefits by providing the access to novel information from loosely connected neighborhoods (Burt 1992; Cummings and Cross 2003). In regard to business units (BU) level study, BU with shorter path lengths to other units that possess related knowledge finish projects faster (Hansen 2002).

Although the relationship between structural properties of individuals' and groups' network with various dimensions of economic performance had attracted lots of attentions (Reagans and Zuckerman 2001; Sparrowe, Liden et al. 2001; Cummings and Cross 2003), in reality the mechanisms driving the structural diversity and performance linkage is much more complicated and require more empirical study. For example, In knowledge transfer study, the nature of knowledge complexity has also impact on performance, when information is simple and explicit, structural diverse network with many weak ties could effectively transfer knowledge and positively impact on the performance, however, when knowledge or information is complex or tacit a cohesive network with strong ties maybe more effective to transfer knowledge and affects on performance (Hansen 1999). So only by providing more empirical evidence to complement the social network theory, our understanding of how social network and structure impact on economic performance could possibly be complete.

With regard to social networks, bigger is hypothesized to be better, because information about novel opportunity is time dependent and flows through existing contacts (Bulkley and Van Alstyne 2004), subsequent empirical study in consulting firm (Wu 2011) further validates such argument, my approach from the telecom firm will also make contribution to this part of theory development.

The existence of information benefits—access, timing and referrals, is regarded as the driver to understand the relationship between social structure and performance variation (Burt 1992; Burt 2004). According to previous studies, actors in favorable structural positions enjoy social and economic advantages based on their access to specific types of information (Hansen 1999) and their ability to gather non-redundant information (Cummings and Cross 2003). Meanwhile, the weak ties empower actors to deliver superior performance from socially constrained norms or geographical and cultural distance. Furthermore, Burt (1992) argues that networks rich in structural diversity confer “information benefits” by providing access to diverse perspectives, ideas and information. As information in local network neighborhoods tends to be redundant, structurally diverse contacts provide channels through which novel information flows to individuals from distinct pools of social activity. During a study conducted by Burt in 1997, he found that managers with structurally diverse networks spanning multiple structural holes are more successful to enjoy wage advantage and promotion (Burt 1997). Similarly, employees in research and development positions having diverse contacts outside of their team are more productive (Reagans and Zuckerman 2001). Redundant information is less valuable because many actors are aware of it at the same time, reducing opportunities associated with its use. Structural redundancy is also inefficient because actors incur costs to maintain redundant contacts while receiving no new information from them (Burt 1992). So the key mechanism through which network structures are theorized to improve performance is via access to novel, non-redundant information (Burt 1992). I will use survey and internal business intelligence data to differentiate novel and redundant information while test the theory under business unit context.

While information benefits can be generated via structurally diverse network, be it direct or indirect, however, the fact that information content distortion can not be ignored. When information pass through long path lengths (Freeman 1979), the chance of distortion is very high, as people tend to misunderstand the content(Hansen 2002). Imprecise information will have negative effect on the performance while costly for the actors to eliminate and correct. In such situation, actors with short path lengths to the original information source or other experts will be more productive. Betweenness centrality (Freeman 1979): a measure of how often an actor is positioned on the shortest path between other pairs of actors in the network, has been introduced to analyze such issue. Similar to betweenness centrality, network reach measures the degree to which an actor can reach everyone else in the network. An actor with broad network reach will be less impacted on information distortion. Consequently, network reach can facilitate information transfer and improve work performance. I will use these two concepts in my hypothesis development of future study.

Another contribution comes from this research is that I use business unit as the factor of analysis, which go beyond the traditional ego-centric (employee) (Burt 1992) or bounded networks (organization)(Ibarra and Andrews 1993) focus. I will analyze the structural properties of both its individual employee and the collection as a whole. As for the examination of network structures in groups, early scholars focused on the association between different communication patterns and performance(Leavitt 1951; Guetzkow and Simon 1955) and find out that groups with decentralized communication nets take less time to finish complex tasks than groups with centralized communication nets(Shaw 1964). Furthermore, the respective structural properties of managers in work groups (Hierarchical structure, Core-periphery structure and Structural holes) have indicated negative impact on complex, non-routine performance output (Cumplings and Cross 2003).

#### **4 SUMMARY AND FUTURE WORK**

By reviewing and summarizing the existing work. My future work based on this short review will be analyzing a large international organization's business unit and individual's network characteristics and combing it with detailed performance data spanning 3 years. I will show the relationship between Enterprise 2.0 enabled social networks, social capital with measureable economic performance implication. My study lends broad support for previous study on social network theory and provides new evidence to validate the relationship between network structure and performance. The follow-up study will be conducting relevant empirical study to identify other intermediate mechanism links network structure and performance while develop other complementary hypothesis to complete my study. The time invariant heterogeneities could be further examined via robustness check. To lend a causal interpretation to the analysis, I will examine the changes of performance before and after the adoption, it helps to explain the validity of Enterprise 2.0 platform enabled network change on economic performance.

Such research has implication for managers responsible for the productivity of IT enabled workforce; in particular, the expected finding on relationship between network diversity and productivity could help management optimize the structure of human resource in different information work settings. Further more, future IT investment on Enterprise 2.0 platform could be more productive by encouraging employees more committed to the internal platform. The research approach from social network analysis and information economics also make contribution to the study of information flow inside firms, the combination of using business intelligence data and accounting data at business unit level opens path to study such Enterprise 2.0 associated phenomenon.

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## THE IMPORTANCE OF SELF-EFFICACY FOR ENTREPRENEURIAL SUCCESS

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### ABSTRACT

*The purpose of this paper has been to gain an understanding of the concept self-efficacy and how it relates to entrepreneurial performance, with the aim of establishing how this personal attribute can be measured and used to predict entrepreneurial success. According to Bandura (1997) have individuals with high levels of self-efficacy a tendency to set challenging goals; persist toward the achievement of their goals, even under difficult and stressful circumstances; and recover quickly from failure, even in the face of adverse conditions. While entrepreneurial self-efficacy is the degree to which people perceive themselves as having the ability to successfully perform the various roles and tasks of entrepreneurship (Chen, Greene et al. 1998; De Noble, Jung et al. 1999). References will be made to other studies confirming the positive link between self-efficacy and performance, while also introducing moderating variables for conditions when high levels of self-efficacy might actually reduce performance. Research have come a long way in identifying personal attributes and competences for predicting entrepreneurial performance and success, but still much work remains to develop a tested, reliable, validated and applicable framework for accurately assessing the outlook of an entrepreneur.*

**Keywords:** *Self-efficacy, Venture Capital, Entrepreneurship*

### 1. INTRODUCTION

Self-efficacy refers to an individual's belief in their personal capability to accomplish a job or a specific set of tasks (Bandura 1997). This definition of self-efficacy originated as a key concept in Albert Bandura's social cognitive theory, and has later been adopted in various psychological theories. In the field of psychology, self-efficacy play a role in many theories related to motivation, thought patterns, cognitive processes, decisions, future orientation and everyday behavior.

Higher self-efficacy have been found to be positively correlated with performance (Stajkovic and Luthans 1998; Randhawa 2004), which makes assessing the level of self-efficacy in an entrepreneur interesting – from the point of view of a venture capitalist. Should the venture capitalist find high levels of self-efficacy, then a successful exit is also more probable. Social cognitive theory understands self-efficacy as a cognitive mechanism for the stress reaction that the body experiences when performing the task at hand.

Self-efficacy must not be confused with self-confidence, which more relates to self-perceived value and self-image (Taylor 1991). Higher self-efficacy is more a result of successful past achievements, so that the entrepreneur experiences an increased belief in personal abilities. This experience of success also lead to pride and increased self-esteem (sense of self-worth), but the experience of increased self-efficacy has a more lasting effect, so that the entrepreneur will be in a better position to predict outcome of personal effort based on recollection of past success.

Entrepreneurial success can be understood as the absence of failure. Entrepreneurial performance can be considered high when resources and efforts are directed in such a way that long term value is being created.

This paper will discuss the definition, dimensionality and measurement of the self-efficacy construct and how this construct relates entrepreneurial performance.

## **2. SELF-EFFICACY**

### **2.1 Definitions**

There is a quote saying that “Excellence is asking more of yourself than what others do”. Self-efficacy build on personal past experiences of mastery and relates to the quote in the way that self-efficacy measure the person’s competence within a specific framework, focusing on the person’s assessment of their ability to perform specific tasks in relations to goals and standard rather than in comparison with others’ capabilities (Meyer, Turner et al. 1997). A person with high self-efficacy typically seeks challenges with a tolerance for failure, having a learning goal orientation. While a person low in self-efficacy is more inclined to avoid challenges, with a more performance-focused goal orientation – attaining the goal with a minimal effort (ibid). The need to seek challenges fit well with the concept of self-actualization as defined in Maslow’s hierarchy of needs (Maslow 1954) which Maslow simply defined as “What a man can be, he must be” (ibid). A person with a sense of fulfillment in lower level needs, physiological, safety, love, and esteem – will experience a desire to both explore one’s own full potential and realizing that potential (ibid).

Maslow describe this desire as the desire to become more and more what one is, to become everything that one is capable of becoming (ibid). A person with high levels of self-efficacy will typically throughout one’s life constantly challenge oneself, in a pursuit to actualize one’s own potential. The ultimate self-actualization must be to start one’s own corporation, significantly increasing the potential for realizing one’s own potential as oppose to fulfilling the requirements of a regular job. High levels of self-efficacy will therefore lead to nascent entrepreneurial behavior and ultimately to entrepreneurial action (McGee, Peterson et al. 2009).

### **2.2 Factors affecting self-efficacy**

#### **2.2.1 Experience**

The most important factor for deciding a person’s self-efficacy is “mastery experience”, the experience of attaining a belief in one’s own capabilities through past mastery (Bandura 1997). Success raises self-efficacy, while failure lowers self-efficacy. Past experience of mastering challenging situations and tasks will therefore add to the level of self-efficacy, which gives further perseverance when the going gets tough. Past recollections of eventually finding a solution through pure endurance will serve as a reminder that a solution will present itself with enough effort and patience. In some cases can self-efficacy levels get so high, that the person stops experiencing failure in personal achievements – with the understanding that the outcome is merely a result of the effort one put into the task.

#### **2.2.2 Modeling**

A person with high levels of self-efficacy with typically think: “If they can do it, so can I”. Observing other people’s success will result in increased self-efficacy, while seeing other people failing in their attempts will reduce self-efficacy (Bandura 1997). The effect is strongest with high levels of identity with the person being observed.

#### **2.2.3 Social Persuasions**

Positive persuasions increase self-efficacy, while negative persuasions decrease self-efficacy (Bandura 1997). Generally, it is typically easier to decrease a person’s self-efficacy than it is to increase it.

#### **2.2.4 Psychological factors**

Two people can experience the same psychological and physiological signs, alternating the effect on self-efficacy depending on how the person interprets these signs as normal or a sign of their own inability (Bandura 1997).

### **3. CONSTRUCT: ENTREPRENEURIAL SELF-EFFICACY (ESE)**

#### **3.1 Defining entrepreneurial self-efficacy (ESE)**

Studies focusing on entrepreneurial motivation, intentions and behavior typically include entrepreneurial self-efficacy (ESE) as an explanatory variable. There are many factors that influence a person to pursue the idea of becoming an entrepreneur, which can be a combination of personal attributes, traits, background, experience and disposition (Shane, Locke et al. 2003; Baron 2004). Among these personal attributes do we find entrepreneurial self-efficacy (ESE) as particularly important for predicting new venture intentions (Boyd and Vozikis 1994; Zhao, Seibert et al. 2005). Entrepreneurial self-efficacy is a construct measuring a person's belief in their ability to successfully launch an entrepreneurial venture (McGee, Peterson et al. 2009). Entrepreneurial self-efficacy incorporates both personality and environmental factors and is thought to be a strong predictor of entrepreneurial intentions and ultimately action (Bird 1988; Boyd and Vozikis 1994).

Entrepreneurial self-efficacy has emerged as a promising construct, with the potential to predict entrepreneurial performance and for improving the rate of entrepreneurial activities through training and education (Mueller and Goic 2003; Zhao, Seibert et al. 2005; Florin, Karri et al. 2007). Nevertheless, the construct remains empirically underdeveloped and many scholars have called for refinements of the construct (Kolvereid and Isaksen 2006).

#### **3.2 Measuring entrepreneurial self-efficacy (ESE)**

The measure entrepreneurial self-efficacy has been widely adopted for identifying entrepreneurial intentions and consequently entrepreneurial conduct, and for investigating how education and training can be used to improve entrepreneurial action. Nevertheless, researchers have difficulties reaching consensus for how to use the measure. Several scholars (Chen, Gully et al. 2004) are of the opinion that it is not necessary to have a domain-specific entrepreneurial self-efficacy construct, and rather advocate the use of a general measure of self-efficacy. Most scholars acknowledge the multi-dimensional nature of entrepreneurial self-efficacy construct (Zhao, Seibert et al. 2005; Wilson, Kickul et al. 2007), still a detailed examination of the underlying dimensions remain unexplored. There are currently inconsistencies in how researchers go about capturing the dimensionality of the entrepreneurial self-efficacy construct.

#### **3.3 Dimensionality of entrepreneurial self-efficacy (ESE)**

##### **3.3.1 Unidimensional**

Even though most scholars agree that entrepreneurial self-efficacy is best understood as a multi-dimensional construct, we still find that much of the empirical research is based on limited-dimensional or even unidimensional measures of ESE (Baum, Locke et al. 2001; Baum and Locke 2004; Kristiansen and Indarti 2004). Some researcher go as far as claiming to have measured entrepreneurial self-efficacy by simply asking respondents to answer one or two questions about their confidence in launching a new venture. This was recently done in a study by Tominc and Rebernik (2007) where respondents had to provide a yes/no response to the question, "*Do you have the knowledge, skills, and experience required to start a new business?*". A simple misinterpretation, like the respondent thinking that she needs relevant startup experience, before having the *required* experience to start a new business – would serve as the basis for obtaining the wrong answer.

##### **3.3.2 Multi-dimensional**

Studies that have understood and try to measure the broader multi-dimensional nature of the entrepreneurial self-efficacy construct, still get it wrong by relying on a "total ESE" score rather than focusing more on the underlying dimensions (Chen, Greene et al. 1998; De Noble, Jung et al. 1999; Zhao, Seibert et al. 2005). A total or composite measure of ESE makes it impossible to distinguish which dimensions of self-efficacy are more influential in creating entrepreneurial intentions, if for instance a high

level of self-efficacy in risk-taking or management is of more importance than a high level of self-efficacy in financial control.

The use of a “total” entrepreneurial self-efficacy score is limiting the potential impact of research carried out, which is apparent in the study by Zhao et al. (2005) that looked into the mediating role of self-efficacy in the development of entrepreneurial intentions. They found that entrepreneurial education was positively linked to higher levels of entrepreneurial self-efficacy, and it was also reported that higher levels of entrepreneurial self-efficacy made a positive contribution to entrepreneurial intentions. Which is interesting since it confirms the benefits of entrepreneurial education. But the use of a composite entrepreneurial self-efficacy score makes it impossible to identify which areas of education and training that are most effective in strengthening entrepreneurial self-efficacy (McGee, Peterson et al. 2009).

The multi-dimensional nature of the entrepreneurial self-efficacy construct was empirically confirmed by Mueller and Goic (2003), finding that individual’s level of entrepreneurial self-efficacy varied by each of the four phases of the venture creation process model (searching, planning, marshaling and implementing). The four-phase venture creation process model proposed by Stevenson, Roberts and Grousbeck (1994) was adapted, constructing a separate measure of entrepreneurial self-efficacy for specific tasks associated with each phase.

Another study focusing on the underlying dimensions of the entrepreneurial self-efficacy construct in a disaggregated manner was conducted by Barbosa et al. (2007), examining the relationship between cognitive styles and four task-specific types of entrepreneurial self-efficacy. They found that the underlying dimensions (opportunity-identification self-efficacy, relationship self-efficacy, managerial self-efficacy and tolerance self-efficacy) may have individual and unequal relationships to multiple dependent variables, in particular entrepreneurial intentions and nascent behavior.

#### **4. DISCUSSION AND CONCLUDING REMARKS**

The purpose of this paper has been to gain an understanding of the concept self-efficacy and how it relates to entrepreneurial performance, with the aim of establishing how this personal attribute can be measured and used to predict entrepreneurial success. Entrepreneurial self-efficacy is the degree to which people perceive themselves as having the ability to successfully perform the various roles and tasks of entrepreneurship (Chen, Greene et al. 1998; De Noble, Jung et al. 1999). It is unlikely that the entrepreneur will be sufficiently motivated to succeed in the new venture creation process without minimal levels of entrepreneurial self-efficacy (Boyd and Vozikis 1994; Markman, Balkin et al. 2002; Zhao, Seibert et al. 2005). Chen et al. (2004) showed in their study that general self-efficacy is positively linked with performance, while more recent research show that higher levels of self-efficacy is not necessarily purely beneficial. Markman et al. (2005) find that those who undertake the daunting task of creating new ventures are more perseverant and more efficacious than those who work as employees. The study also found that despite favorable social views of perseverance and self-efficacy, positive attributes seem to co-occur with increased tendencies to engage in regretful thinking. According to Bandura (1997) have individuals with high levels of self-efficacy a tendency to set challenging goals; persist toward the achievement of their goals, even under difficult and stressful circumstances; and recover quickly from failure, even in the face of adverse conditions.

Hmieleski and Baron (2008) found in their study that the effects of high entrepreneurial self-efficacy on firm performance were positive when combined with moderate optimism, but negative when combined with high optimism - in dynamic environments. Under stable environments, in contrast, the effects of self-efficacy were relatively weak, and were not moderated by optimism. The study confirms how self-efficacy is particularly advantageous in the context of new venture creation, which is characterized by information overload, high uncertainty, and high time pressure (Baron 1998), leading their firms to higher levels of revenue and employment growth (Baum, Locke et al. 2001; Baum and Locke 2004) than those comparatively lower in entrepreneurial self-efficacy.

While previous literature suggests that high entrepreneurial self-efficacy is always beneficial to entrepreneurs (Baum, Locke et al. 2001; Baum and Locke 2004), situations have been found which high entrepreneurial self-efficacy may prove detrimental – although it is generally beneficial for entrepreneurs. Entrepreneurs may gradually move toward complacency, overconfidence, a tendency to assume excessive risk, and other ineffective strategies – without some expectation that negative outcomes might occur to keep such beliefs in personal efficacy under control (i.e. a realistic outlook). Especially entrepreneurs high in dispositional optimism, leading their start-ups toward growth under rapidly and unpredictable changing conditions have to be alert to the emerge of such patterns (Hmieleski and Baron 2008). The misalignment between the individual characteristics of entrepreneurs and the environments in which they lead their firms might be an important contributing factor to the high incidence of failure for start-ups, considering that entrepreneurs who possess the combination of high entrepreneurial self-efficacy and high dispositional optimism are most likely to be drawn toward starting new ventures in dynamic industry environments – which appears to be a common pattern (Hmieleski and Baron 2008).

This report show that research has come a long way in developing a construct for predicting entrepreneurial performance and success, but still much work remains to develop a tested, reliable, validated and applicable framework for accurately assessing the outlook of an entrepreneur.

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**INCOME DISPARITIES IN THE USA:  
EVIDENCE IN THE CAPE FEAR REGION IN NORTH CAROLINA USING ANOVA ANALYSIS.**

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**ABSTRACT**

*An ANOVA analysis provides evidence of significant economic disparities in Per Capita Income among Whites, Blacks, American Indians and Asians in the Cape Fear Region in North Carolina which encompasses 10 counties. Furthermore, the paper found that education is still the main factor that engenders disparities among the different races. The study used data from the US Census Bureau, the American Community Survey, the North Carolina Department of Commerce and many other sources.*

**Keywords:** *Economic Disparities; Per Capita Income, Cape Fear Region in North Carolina*

**1. INTRODUCTION**

**1.1 Need for the Study**

Cape Fear Region encompasses 10 counties: Bladen, Columbus, Cumberland, Harnett, Hoke, Lee, Moore, Robeson, Sampson and Scotland. In 2005, the total population in the Cape Fear Region was 895,525 and total personal income exceeded \$24,954,505. Although the Cape Fear Region is one of the fastest growing regions in North Carolina, the level of growth is, at best, uneven. The region represents a unique combination of rich and poor and fast and slow growing counties. The incidence of poverty and unemployment is unevenly distributed throughout the region. Economic disparities are, therefore, wide within and across counties. An economic scan of the region can highlight the gap between what is and what ought to be if the economic disparities within the region are to be reduced.

The Base Realignment and Closure (BRAC) will present unique opportunities to the Cape Fear Region, which encompasses the largest army base in the world. It will inject billions of dollars into the region's economy and add approximately 45,000 people to the existing population. An economic scan of the region with a focus on economic disparities will provide a unique perspective to decision-makers regarding how to leverage the assets and resources of each county and also collectively benefit from the economic bonanza that BRAC will present.

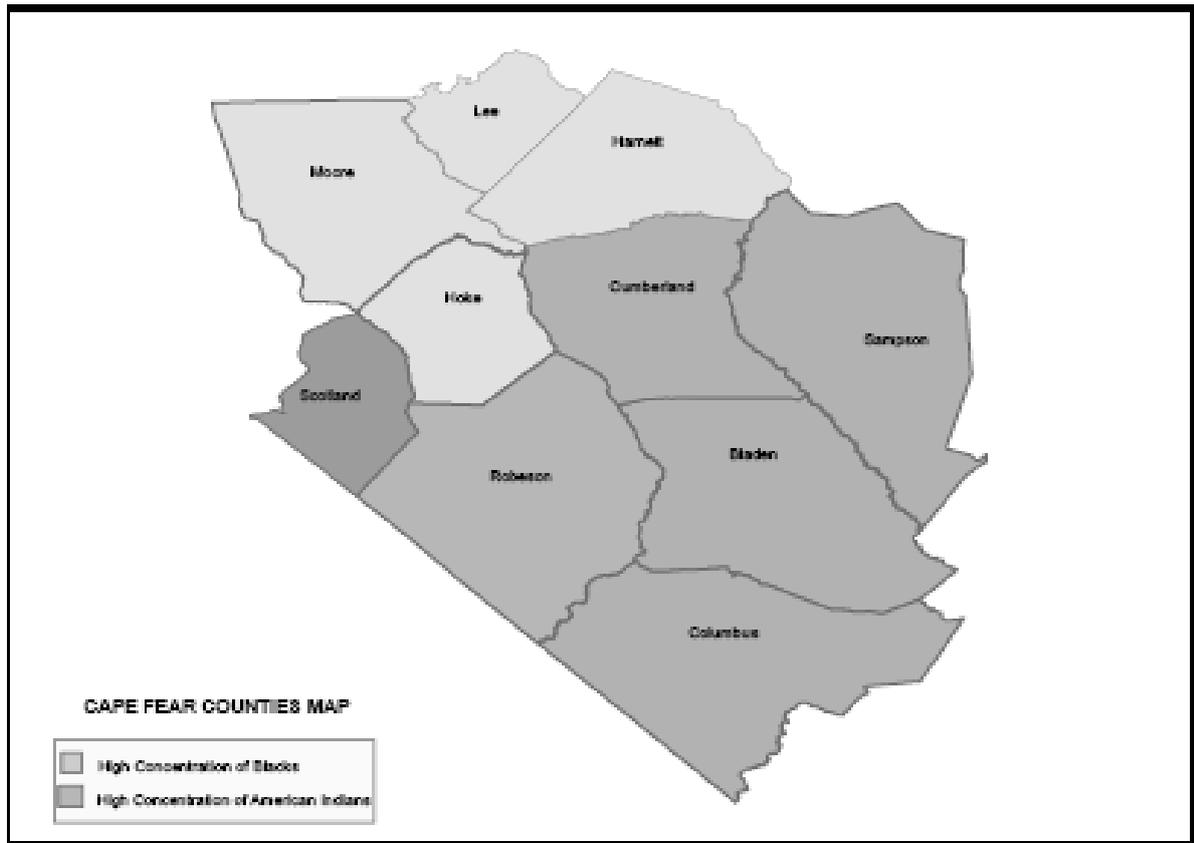
Finally, the study will inform decision-makers whether the trend in economic disparities in the Cape Fear Region has improved or deteriorated during the period 1990 to 2000. The information presented in the study may be used by the policy makers to evaluate existing policies and design new intervention strategies to effectively reduce economic disparities.

**1.2 Study Period and Base Line Year**

The study documents the level and trend in economic disparity during the period 1990-2010. The year 1990 serves as the baseline year for the purpose of this analysis.

**1.3 Scope of the Study**

The study covers 4 counties in the Cape Fear Region. The counties include: Cumberland, Harnett, Moore, and Robeson (see map on page 3). Other counties generally included in the Cape Fear Region were considered beyond the scope of this study.



In what follows, we study the economic disparity by per capita income (PCI). It is worth mentioning that this study emanated from a comprehensive report that the authors wrote entitled "Economic Disparities in the Cape Fear Region Counties 1990-2005". The study was commissioned by the Research Center for Health Disparities at Fayetteville State University. The support for the research was provided by the grant MD001089-01 from the National Institutes of Health, NCMHD and Department of Health and Human Services

## 2. RESEARCH METHODS

In this study we test whether there are Per Capita Income disparities among Whites, Blacks, Asians and American Indians. We use ANOVA to carry out the test. The framework of the ANOVA test is as follows:

$$H_0: \mu_1 = \mu_2 = \mu_3 = \mu_4$$

Where  $H_0$  is the null hypothesis that tests the population means of Per Capita Income for the four races (White, Black, Asian and American Indian) are equal.

Where  $\mu_1$ ,  $\mu_2$ ,  $\mu_3$ , and  $\mu_4$  delineate the Per Capita Income means for Whites, Blacks, Asians, and American Indians respectively.

The alternative ( $H_a$ ) is that at least one population mean differs from the other population means.

$$H_a: \mu_i \neq \mu_k \text{ for some } i, k$$

### 2.1 Assumptions underlying ANOVA:

The three primary assumptions are:

1. The observations are random and independent samples from the populations (Hinkle, Wiersma and Jurs).
2. The distributions of the populations from which the samples are selected are normal. This assumption implies that the dependent variable (Per Capita Income) is normally distributed (a

theoretical requirement of the underlying distribution, is the  $F$  distribution) in each of the populations (Hinkle, Wiersma and Jurs).

3. The variances of the distributions in the populations are equal. It is called the assumption of **homogeneity of variance**. This assumption, along with the normality assumption and the null hypothesis, provides that the distributions in the populations have the same shapes, means, and variances; that is, they are the same population (Hinkle, Wiersma and Jurs).

**Note that ANOVA is robust with respect to violations of the assumptions, except in the case of unequal variances with unequal sample sizes.** Therefore, we will use the Levine's test to test for the homogeneity of variance. The null hypothesis for testing the assumption of homogeneity of variance is that there is no difference in the variances of the Per Capita Income' averages of the four different races. Symbolically,

$$H_0: \alpha_1^2 = \alpha_2^2 = \alpha_3^2 = \alpha_4^2$$

Where  $\alpha_1^2, \alpha_2^2, \alpha_3^2$ , and  $\alpha_4^2$  are the variances of the Per Capita Incomes of Whites, Blacks, Asians, and American Indians respectively.

$$H_a: \alpha_i^2 \neq \alpha_k^2$$

For some  $i, k$

## 2.2 Testing the Null Hypothesis in the study:

We will use ANOVA to test the Per Capita Incomes for Whites, Blacks, American Indians and Asians are equal in other words that there is no difference in the Per Capita Incomes' averages of the different races.

## 2.3 Computational Formulas for Sums of Squares:

The computational formulas for  $SS_B$  (Sum of Squares Between),  $SS_W$  (Sum of Squares Within), and  $SS_T$  (Sum of Squares Total) can be derived using the formulas below. First of all, to simplify the formulas, it is convenient to denote the sum of all the scores in the  $k$ th group as  $T_k$ .

$$T_k = \sum_{i=1}^{n_k} X_{ik} \quad (1)$$

Second denote the sum of all observations in all  $K$  groups as  $T$ .

$$T = \sum_{k=1}^K \sum_{i=1}^{n_k} X_{ik} \quad (2)$$

Using this notation, the computational formulas for  $SS_B$  (Sum of Squares Between),  $SS_W$  (Sum of Squares Within), and  $SS_T$  (Sum of Squares Total) become, for between groups:

$$SS_B = \sum_{k=1}^K n_k (\bar{X}_k - \bar{X})^2 = \sum_{k=1}^K \frac{T_k^2}{n_k} \quad (3)$$

For within groups,

$$SS_W = \sum_{k=1}^K \sum_{i=1}^{n_k} (X_{ik} - \bar{X}_k)^2 = \sum_{k=1}^K \sum_{i=1}^{n_k} X_{ik}^2 - \sum_{k=1}^K \frac{T_k^2}{n_k} \quad (4)$$

For the total,

$$SS_T = \sum_{k=1}^K \sum_{i=1}^{n_k} (X_{ik} - \bar{X})^2 = \sum_{k=1}^K \sum_{i=1}^{n_k} X_{ik}^2 - \frac{T^2}{N} \quad (5)$$

## 2.4 Steps for testing the Null Hypothesis:

We will adopt the following 4 steps to test the Null Hypothesis:

**Step 1: State the Hypotheses:**

$$H_0: \mu_1 = \mu_2 = \mu_3 = \mu_4$$

$$H_a: \mu_i \neq \mu_k \text{ for some } i, k$$

We are stating in the Null Hypothesis that there is no difference in the Per Capita Personal Incomes among Whites, Blacks, Asians, and American Indians.

We test this hypothesis at the **.05 significance level**.

**Step 2: Set the criterion for rejecting  $H_0$ :**

The test statistic for one-way ANOVA is the  $F$  ratio defined as  $MS_B$  (Mean Square Between) divided by  $MS_W$  (Mean Square Within):  $MS_B/MS_W$ . The sampling distribution of the  $F$  ratio is the  $F$  distribution. There is a family of  $F$  distributions, each one a function of the degrees of freedom associated with the two variance estimates (Hinkle, Wiersma and Jurs). In ANOVA,  $K-1$  degrees of freedom are associated with  $MS_B$ , and  $N-K$  degrees of freedom are associated with  $MS_W$ . Thus, the sampling distribution of the  $F$  ratio  $MS_B/MS_W$  is the  $F$  distribution with  $K-1$  and  $N-K$  degrees of freedom, or  $F_{(K-1, N-K)}$ . In ANOVA, the alternative hypothesis does not specify the direction of the group differences; however, the region of rejection in the  $F$  distribution is only in the right-hand tail because the observed  $F$  ratio is a ratio of two nonnegative values, the mean squares (Hinkle, Wiersma and Jurs). Large discrepancies among the sample means yield a large mean square among the groups, regardless of the direction of the differences. Because these discrepancies are squared, direction is lost.

In our study, there are  $K-1 = 4-1=3$  degrees of freedom associated with  $MS_B$  and  $N-K = 48-4 = 44$  degrees of freedom associated with  $MS_W$ . **The critical value of  $F$  for 3 and 44 degrees for  $\alpha = .05$  is 2.84. Since we have set  $\alpha = .05$ , the Null Hypothesis will be rejected if the calculated  $F$  exceeds 2.84.**

**Step 3: Compute the Statistics:**

We will report the entire summary table for ANOVA, including the sums of squares, degrees of freedom, and mean squares, as well as the  $F$  ratio in the results' section of this study.

**Step 4: Interpret the results:**

This step includes deciding whether to reject the Null Hypothesis and then providing some clarification about what that decision means in the context of the variables and the setting. The decision about the Null Hypothesis is made by comparing the test statistic, the computed  $F$  ratio, with the critical value (2.84). If the computed  $F$  ratio exceeds the critical value, the hypothesis is rejected; if not, the hypothesis is not rejected.

**2.5 Post Hoc Multiple-Comparison Tests**

When the null hypothesis in the ANOVA is rejected, we want to know whether the significant  $F$  ratio is due to differences between pairs of means (for instance is it due to differences in PCI means of Whites and Blacks, or Asians and Blacks, etc...) or perhaps to some more complex combinations of means. Post hoc multiple-comparison tests maintain the Type I error rate at  $\alpha$  when a series of comparisons is made among sample means (Hinkle, Wiersma and Jurs). Instead of the usual interpretation of the Type I error when testing a single hypothesis, these post hoc tests are usually described in terms of their comparisonwise error rate or experimentwise error rate. An experimentwise error rate is defined as the probability of making at least one Type error for the set of all possible comparisons in an experiment. A comparisonwise error rate is the probability of making a Type I error for any of the comparisons.

The comparisonwise error rate is defined simply as  $\alpha$ , or the level of significance, for each comparison. To control for this error rate requires only that each test be conducted at the a priori  $\alpha$  level. For example in our ANOVA study using 4 ethnic groups, there are 12 different pairs of means that could be compared: Whites with Blacks, Whites with Asians, and so on. Since we test each of these pairwise comparisons at  $\alpha = .05$ , the probability of a Type I error for each comparison is .05.

In contrast, the experimentwise error rate ( $\alpha_E$ ) is the probability of making at least one Type error for the set of all possible comparisons. This assumes that the comparisons ( $c$ ) are independent. However, in ANOVA the  $c$  comparisons are not independent. Therefore, an approximation of  $\alpha_E$  will be used which

provides us with a simple procedure for determining the  $\alpha$  necessary for each comparison in order to maintain  $\alpha_E$  at the a priori level of significance across all comparisons. Note that, even though this procedure controls the experimentwise error rate, it is extremely conservative and may result in no significant comparisons even when the  $F$  ratio of the ANOVA is significant.

A less conservative procedure is to use one of the post hoc multiple-comparison tests that maintain  $\alpha_E$  at the a priori  $\alpha$  level by using the **studentized range (Q) distributions**, rather than the  $t$  distributions, as the sampling distributions. When conducting post hoc tests with equal group sizes, both the **Tukey, often called HSD (honestly significant difference) and the Newman-Keuls** methods are appropriate. The test statistic for both is  $Q$ , and the underlying distribution is the studentized range distribution for the appropriate degrees of freedom. Of the two methods, the Newman-Keuls is statistically more powerful. However, the Tukey method maintains the experimentwise Type I error rate at the a priori  $\alpha$  level. In our study, we will use both methods to conduct the post hoc tests.

### 3. EMPIRICAL RESULTS

We used SPSS (Statistical Package for the Social Sciences) software to run the various tests. The following coding has been used to run the tests: **White = 1, Blacks = 2, Asians = 3 American Indians = 4**, (Green and Salkind).

The following tables summarize the descriptive statistics, the test of homogeneity of variances or Levine's test and the ANOVA results:

#### 3.1 Descriptive Statistics Results

The descriptive statistics results of the PCI 1990-2010 for Whites, Blacks, Asians, and American Indians are summarized in Table 1. During the decade 1990-2010 Whites had the highest mean PCI (\$19,548.00) while Blacks had the lowest mean PCI (\$11,197.17 which is about 43% less than that of whites). Asians had the second highest mean PCI (\$14,838.33 which is about 24% than that of Whites but 24% higher than that of Blacks.). American Indian had the third highest mean PCI (\$11,571.75 which is 41% less than that of Whites and 22% less than that of Asians). It is worthwhile noting that American Indians' mean PCI was only 3% higher than that of Blacks.

**Table 1: Descriptive Statistics PCI 1990-2010**

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
WHITE	12	19548.00	6056.139	1748.257	15700.11	23395.89
BLACK	12	11197.17	4017.029	1159.616	8644.87	13749.47
ASIAN	12	14838.33	5923.496	1709.966	11074.72	18601.94
AMERICAN INDIAN	12	11571.75	3829.889	1105.594	9138.35	14005.15
Total	48	14288.81	5955.655	859.625	12559.47	16018.15

#### 3.2 Test of Homogeneity of Variance Results

In table 2, the Levene  $F$  statistic ( $F = 1.0433$ ) is less than the critical value for  $F$  ( $F_{3,44} = 2.84$ ); we fail to reject the null that the different variances are equal, thus, the assumption of homogeneity of variances is met. The significance value (or p-value) for the Levene's test is 0.383, which is greater than the set a priori  $\alpha$  at .05. Keep in mind that even if the assumption of homogeneity of variances is violated, ANOVA is robust with respect to violations of the assumptions, except in the case of unequal variances with unequal sample sizes.

**Table 2: Test of Homogeneity of Variance PCI 1990-2010**

Levene Statistic	df1	df2	Sig.
1.043	3	44	.383

**3.3 ANOVA test results**

Table 3 summarizes the ANOVA test results of the Null Hypothesis that the Per Capita Mean incomes in 1990-2010 of the different races are equal. The *F* statistic for the ANOVA ( $F = 7.004$ ) is greater than the *F* critical value ( $F_{cv} = 2.84$ ); therefore the Null Hypothesis that PCI means of the different races are equal is rejected. The probability statement for this latter test statistic is “The probability that the observed differences in the sample means would have occurred by chance if this Null Hypothesis were true (that is the population means were equal) is less than .05.” The Sig. value (or p-value) in the printout equals 0.001, which implies that the probability of such an occurrence is actually less or equal than 0.001. The conclusion is that not all the population means are equal. At this point, we do not know which means differ significantly. This determination will be made using post hoc multiple-comparison tests in what follows.

**Table 3: ANOVA Test PCI 1990-2010**

	Sum Squares	df	Mean Square	F	Sig.
Between Groups	5.388E8	3	1.796E8	7.004	.001
Within Groups	1.128E9	44	25642298.059		
Total	1.667E9	47			

**3.4 Post Hoc tests**

Table 4 contains the printout from SPSS for the Tukey HSD method following the significant ANOVA test which rejected that the PCI means for White, Black, Asian and American Indian are equal. The results show that the PCI mean differences between White and Black, White and Asian and White and American Indian are \$8,350.83, \$4709.67 and \$7976.25 respectively.

The p values for the three PCI mean differences are 0.001, 0.119 and 0.119 respectively which suggest that the PCI mean differences between White and Black, and White and American Indian are significantly different at 0.05 significance level while the difference between White and Asian is not significant at 0.05 significance level. The PCI mean differences between Asian and Black, and Asian and American Indian are \$3,641.17, and \$3266.58 respectively. The p values for the PCI mean differences are 0.305 and 0.400 respectively which suggest that the PCI mean differences between Asian and Black, and Asian and American Indian are not significantly different at 0.05 significance level.

**Table 4: Post Hoc Multiple-Comparisons Tests**  
**Dependent Variable: PCI**

	(I) RACE	(J) RACE	Mean Difference (I-J)	Std. Error	Sig.
Tukey HSD	WHITE	BLACK	8350.833 <sup>*</sup>	2067.297	.001
		ASIAN	4709.667	2067.297	.119
		AMERICAN INDIAN	7976.250 <sup>*</sup>	2067.297	.002
	BLACK	WHITE	-8350.833 <sup>*</sup>	2067.297	.001
		ASIAN	-3641.167	2067.297	.305
		AMERICAN INDIAN	-374.583	2067.297	.998
	ASIAN	WHITE	-4709.667	2067.297	.119
		BLACK	3641.167	2067.297	.305
		AMERICAN INDIAN	3266.583	2067.297	.400
	AMERICAN INDIAN	WHITE	-7976.250 <sup>*</sup>	2067.297	.002
		BLACK	374.583	2067.297	.998
		ASIAN	-3266.583	2067.297	.400

The PCI mean difference between American Indian and Black is \$374.58. The associated p value is 0.998 which suggests that the PCI mean difference between American Indian and Black is not significantly different at the 0.05 significance level.

In conclusion the Tukey HSD Post Hoc Test suggests that Whites made significantly more income than Blacks and American Indians while the PCI mean differences for Asians, Blacks and American Indians were not significantly different from each other. Furthermore, the test suggests that the PCI of Whites and Asians are not significantly different which seem to be erroneous because it already shows that the incomes of Asians, Blacks and American Indians were not significantly different. Table 5 uses the Newman-Keuls method which is a more statistically powerful test than Tukey's method. The test uses homogeneous subsets to find out which subsets contain group means that do not differ significantly from each other.

**Table 5: Tukey and Newman-Keuls Methods- Homogeneous Subsets**

**Dependent Variable: PCI**

	RACE	N	Subset for alpha = 0.05	
			1	2
Student-Newman-Keuls <sup>a</sup>	BLACK	12	11197.17	
	AMERICAN INDIAN	12	11571.75	
	ASIAN	12	14838.33	
	WHITE	12		19548.00
	Sig.		.194	1.000
Tukey HSD <sup>a</sup>	BLACK	12	11197.17	
	AMERICAN INDIAN	12	11571.75	
	ASIAN	12	14838.33	14838.33
	WHITE	12		19548.00
	Sig.		.305	.119

Means for groups in homogeneous subsets are displayed.

**Dependent Variable: PCI**

		N	Subset for alpha = 0.05	
RACE	1		2	
Student-Newman-Keuls <sup>a</sup>	BLACK	12	11197.17	
	AMERICAN INDIAN	12	11571.75	
	ASIAN	12	14838.33	
	WHITE	12		19548.00
	Sig.		.194	1.000
Tukey HSD <sup>a</sup>	BLACK	12	11197.17	
	AMERICAN INDIAN	12	11571.75	
	ASIAN	12	14838.33	14838.33
	WHITE	12		19548.00
	Sig.		.305	.119

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 12.000.

Table 5 contains the SPSS printout of the Newman-Keuls procedure. There are two homogeneous subsets of means, the group for White by itself, and groups for Black, American Indian and Asian. From these homogeneous subsets, the conclusions are that the PCI mean for Whites is significantly different from the PCI means for Blacks, American Indians and Asians at the 0.05 significance level. The remaining group PCI means (Blacks, American Indians, and Asians) do not differ significantly. These results are more plausible and make more sense than those suggested earlier with the Tukey method. Using the same procedure with Tukey HSD, there are also two homogeneous subsets of means, the group for Whites and Asians, and the group for Black, American Indians and Asians. These results suggest that the PCI means for Whites and Asians are not significantly different from each other at the 0.05 significance level. The results also suggest that the PCI means for Asians, Blacks and American Indians are not significantly different from each other at the 0.05 significance level. This test corroborates the findings of the previous Tukey HSD test.

**4. CONCLUSIONS AND POLICY RECOMMENDATIONS**

This study investigates the economic disparities in the USA by using data from the Cape Fear Region Counties in North Carolina. Data on Per Capita Income for 4 counties (Cumberland, Harnett, Moore, and Robeson) in the Cape Fear Region are obtained from the US Census Bureau and the other institutions above mentioned. We use an ANOVA analysis to test whether the Per Capita Income Means are equal for Whites, Blacks, American Indians and Asians in the 4 counties.

The ANOVA test rejects the Null Hypothesis that the Per Capita Income Means. The disparity among the 4 counties in the Cape Fear Region and the state can be reduced if (1) per capita personal income growth rates in the Cape Fear Region are higher than that of the state and (2) poor counties grow faster than the regional average. During 2000-2005, the average growth rate of per capita income in the Cape Fear Region and in poor counties in particular was indeed much higher than that of the state and other high income counties. This trend, however, must persist for a fairly long period to reduce the level of disparity.

Education is one the most important factor in reducing disparities. Income per capita is closely correlated with the number of college degree holders. The adult education correlation coefficient is 0.8521 for the Cape Fear Region. In a flat world, the most rewarding investment is in human capital. Indeed, the most effective way to reduce disparity within the region and between the races is to reduce the dropout rate and encourage citizens to enroll in higher education. The average drop-out rate in this region is approximately 18 percent, which is three percentage points higher than state and national averages. Further, only 18 percent of adults in this region have college degrees, despite the fact that the difference

in the median salary of high school and college graduates is more than \$22,000 per year. Liberal Arts education, although important, is not enough. A skilled labor force must have vocational-based training as well as professional degrees that are geared toward careers which are projected to increase in the future. According to the Bureau of Labor Statistics, the following occupations (in descending order) are projected to experience the largest employment between 2004-2014: home health aides; network systems and data communications analysts; medical assistants; physician assistants; computer software engineers; physical therapists, dental hygienists; dental assistants, database assistants; physical therapists; forensic science technicians; veterinary technologists and technicians; diagnostic medical sonographers; occupational therapist assistants; and medical scientists except epidemiologists. Occupations projected to experience the largest numerical decreases in employment (in descending order) between 2004-2014 include: farmers and ranchers; stock clerks and order fillers; sewing machine operators; file clerks; mail clerks and mail machine operators except postal service; computer operators; secretaries except medical, legal and executives; cutting, punching and press machine setters, operators and tenders, metal and plastic; telemarketers; word processors and typists; credit authorizers, checkers and clerks; machine feeders and off-bearers; textile winding, twisting and drawing-out machines setters and operators; office machine operators; switchboard operators and door-to-door sales workers.

There is a dire need for each of the counties to prepare the youth for future occupations and dissuade them from enrolling in curricula that prepares them for professions in declining occupations. Schools and colleges should carefully review and implement the recommended competencies listed in the 2000 report issued by the Secretary of Education and entitled What Work Requires of Schools: A SCAN Report for America 2000. The county government has an important role in workforce development. Instead of providing free education to all students who enroll in community colleges (as has been recently suggested), it should provide funding for non-credit career preparatory courses.

BRAC is often hailed as the magic wand that will transform the Cape Fear Region within the next three to four years. It is true that BRAC will bring unprecedented opportunities to the 10 counties in the region, but are these counties ready to seize the opportunity? In a region where less than 18 percent of the adult population hold college degrees and SAT scores are below the state average, the prospect of great strides in gainful employment are bound to be limited. High-demand and high-salary jobs will be filled, but will the citizens of the 10 counties fill these positions or will workers from outside?

It is time the county planners realize that job creation is not an end in itself. It is simply a means to raise the standard of living and improve the quality of life. Accordingly, the emphasis must shift from quantity to the quality of jobs that are created.

The counties must assess and identify their strengths and learn how to leverage their assets in a flat global economy. Instead of directing economic development efforts in multiple directions, policy makers must develop a more strategic approach which focuses on a cluster of industries. This requires the cooperation of all sectors of the economy: businesses, government, civic leaders, labor, and educators. Instead of establishing business councils, one should opt for Community Economic Development Councils that include all of the entities listed above.

Counties can emulate the best practices of some cities and counties in the United States that have developed exemplary programs for employer-based training. The funding for employer-based training is provided by imposing a supplemental unemployment insurance tax. This will ensure that existing industries will stay in a county because they will have an incentive to continuously upgrade the skills of their employees. Alternatively, the county could share some of the costs with industry in developing industry-led skills alliances.

The investment in infrastructure to build entrepreneurial capacity, a knowledge base, and career-training facilities and to connect low income areas in a county by providing access to high-speed broadband internet and efficient public transportation will be an effective strategy to reduce economic disparities.

This study is not by any means exhaustive, it is only the first phase of more comprehensive studies in the near future. With the recent release of the 2010 census we suggest further studies to investigate whether

income gap among the different races has been reduced or widened during the last decade between 2000 and 2010 by investigating PCI growth rates of the different races. Moreover, we suggest further studies to investigate the economic disparities among the races by including more independent variables such as county and year. In other words investigate whether there is a county effect and or a year effect on income disparities among the races.

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