Volume 7, Number 1 **ISSN 1544-0222**

JOURNAL OF INTERNATIONAL BUSINESS RESEARCH

Balasundram Maniam
Editor
Sam Houston State University

Editorial and Academy Information
may be found on the Allied Academies web page
www.alliedacademies.org

The *Journal of International Business Research* is owned and published by the DreamCatchers Group, LLC, and printed by Whitney Press, Inc. Editorial Content is controlled by the Allied Academies, a non-profit association of scholars, whose purpose is to support and encourage research and the sharing and exchange of ideas and insights throughout the world.

Whitney Press, Inc.

Printed by Whitney Press, Inc.
PO Box 1064, Cullowhee, NC 28723
www.whitneypress.com

All authors must execute a publication permission agreement taking sole responsibility for the information in the manuscript. The DreamCatchers Group, LLC is not responsible for the content of any individual manuscripts. Any omissions or errors are the sole responsibility of the individual authors..

The *Journal of International Business Research* is owned and published by the DreamCatchers Group, LLC, PO Box 2689, Cullowhee, NC 28723, USA. Those interested in subscribing to the *Journal*, advertising in the *Journal*, submitting manuscripts to the *Journal*, or otherwise communicating with the *Journal*, should contact the Executive Director of the Allied Academies at info@alliedacademies.org.

JOURNAL OF INTERNATIONAL BUSINESS RESEARCH

CONTENTS

EDITORIAL REVIEW BOARD

LETTER FROM THE EDITOR

We are extremely pleased to present the *Journal of International Business Research*, an official journal of the Academy of International Business Research. The AIBR is an affiliate of the Allied Academies, Inc., a non profit association of scholars whose purpose is to encourage and support the advancement and exchange of knowledge, understanding and teaching throughout the world. The *JIBR* is a principal vehicle for achieving the objectives of the organization. The editorial mission of this journal is to advance the knowledge and understanding of international business throughout the world. To that end, the journal publishes high quality, theoretical and empirical manuscripts which advance the discipline.

The manuscripts contained in this volume have been double blind refereed. The acceptance rate for manuscripts in this issue, 25%, conforms to our editorial policies.

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

The Editorial Policy, background and history of the organization and of the Allied Academies, and calls for conferences are published on the Allied Academies website. Please visit our site and know that we welcome hearing from you at any time.

Bala Maniam
Sam Houston State University

www.alliedacademies.org

LEADERSHIP IN THE CITY OF GOLD: AN ARABIAN ADVENTURE OF MODERN MANAGEMENT CAPABILITIES IN THE 21ST CENTURY

James Reagan McLaurin, American University of Sharjah

ABSTRACT

This paper marks the beginning of a series of four that examine the leadership of Dubai, one of the fasting growing cities in the Middle East and the world. The leader of Dubai, Sheik Mohammad Bin Rashid Al Mahktoum, is famous in the not only the Middle East but the world as well, for his visionary leadership that has lead to Dubai becoming celebrated as a modern miracle in the desert, a city of gold for the 21st century. Dubai has become famous for its modern city skyline that boasts the world's tallest building, the Burj Dubai, and the world's only seven star, sail shaped, hotel, the Burj Al Arab. The financial center is fast becoming the favorite in the region. Supersized highways are being constructed to meet the needs of the expanding population. Healthcare City is opening its doors to Mayo, John Hopkins, Harvard, and many others. World famous sporting events are now the norm with the likes of Tiger Woods playing in the Desert Classic. The Dubai World Cup prides itself on being the world's richest horse race. Palm Island, a man-made island in the shape of a palm tree, is an engineering wonder. Thousands of people move to Dubai monthly to occupy the many luxury property developments opening up.

Dubai recognizes outstanding performance in its government departments and services bi-annually through its excellence awards. Governmental entities, departments, centers, authorities, and people are recognized for their achievement and contributions to the success of the Government of Dubai.

This study examines the leadership capabilities of Dubai Municipality as evidenced by the leadership survey results of a group of 200+ mid and upper level-managers. The individuals were participating in the creation of the five year strategic plan for the organization. The purpose of this survey plus others were essential in the creation of relevant goals and objectives for the strategic plan.

The results of this survey provides a unique look at leadership in this Arabian city of gold providing a closer look at the realities of Dubai Municipality.

INTRODUCTION

Leadership has long generated excitement and interest. When people think about leaders, think of the great leaders through history, mighty military commanders, religious figures, and

corporate giants. Leaders are people who influence their followers to achieve organizational objectives through change. (Lussier & Archua, 2007). Leaders are able to communicate to and motivate their followers (Bass, 1960: Cartwright, 1965; Katz & Kahn, 1966). Through the motivation of followers, the organization realizes goal achievement (House, 1971; House and Dessler, 1974; House & Mitchell, 1974). Through change organizations are able to adapt and adjust to the changing environment (Amis, Slack, and Hinings, 2004).

The early trait theorists that thought of leadership as innate qualities that shaped human behavior (James, 1880; Galton, 1869). These theories dominated the early period of leadership research. The findings were weak and often inconsistent and forced researchers to look for other explanations for the success and effectiveness of leaders. A later review by Bass (1990), suggested that personality traits and individual characteristics could be grouped into six categories: capacity, achievement, responsibility, participation, status and situation. These were not determinative of whether one would be a leader but might be indicative of who could emerge as a leader. The behavior era emerged in which the behaviors of leaders was examined. This provided several advantages in that behaviors could be observed, measured, and taught (Lewin & Lippit, 1938; Lewin, Lippit, & White, 1939). The primary study on leadership behaviors was conducted at Ohio State and resulted in the Leader Behavior Description Questionnaire (Hemphill & Coons, 1957). From this, behaviors could be classified as consideration or initiation of structure. The concentration on behaviors though was not enough, powerful situational elements were becoming recognized as influencing leadership. Modern leadership theorists developed a more comprehensive approach to understanding leadership. The emergence of contingency theory recognized the importance of situation, individual characteristics and behaviors as important to leader effectiveness. Transformational and charismatic leaders were now studied as to how change became initiated in organizations (Bass, 1985; Bennis & Nanus, 1985; Conger & Kanungo, 1998).

From this background, the current study has its evolutionary roots. The desire to assess the leadership capabilities in Dubai Municipality was the primary objective of the study. The overriding objective for this study and other related studies was the development of a five year strategic plan for the organization.

The population that was examined was referred to as the Leadership Group and consisted of individuals from the middle and upper-levels of management. The sample consisted of 227 respondents from thirty various departments and centers in the organization. At the time, over 17,000 people were employed. This was the single largest employer in Dubai. The executive level consisted of the Director General, two Associate Director Generals, and ten Assistant Director Generals. These individuals were not part of the study sample.

SURVEY AND RESULTS

The leadership survey was 15 items, with a 1 to 5 response scale. One was never and five was always. The questions were designed so a high score represents high performance and a low score represents. The surveys were answered as part of a three day workshop on leadership for the Leadership Group. The following are the questions asked in the survey:

1. Are you upset / dissatisfied with the current performance standards of your organization and /or any of the functional sections?
2. Do you have a clear and definitive vision of what should be done in order to upgrade performance standards?
3. Do you believe that putting more emphasis on the competencies, qualifications and capabilities of your division's managers, supervisor and other personnel would lead to the targeted success?
4. Did you set clear, written and measurable targets for your division?
5. Are you aware of the necessity for setting ambitious objectives that require the maximum potential of your team members, but simultaneously do not exhaust all their energy?
6. Do you appraise performance of your sub-ordinates though personal face-to-face interviews with them?
7. Do you chair team meetings in order to deliberate the strategy and objectives of your organization?
8. When you praise the excellent subordinates, do you have a clear image of their actual contribution to the overall upgrading of performance?
9. Do your colleagues consider you a tactful communicator and effective orator who are capable of grabbing g their attention and fuelling their enthusiasm in support of your views?
10. Do you allow others to assess your team's performance on regular basis? Do you consider their views and inputs in upgrading of your divisional performance?
11. How many hours per week do you spend on holding bilateral meetings with customers and staff? (30 hours would be equivalent to rating 5) (15 hours would be equivalent to rating 3)(5 hours and less would be equivalent to rating 1)
12. Have you adopted a clear and written plan for upgrading of your leadership qualities?
13. What is your personal role in the process of transformation within the organization? The extent of your responsibilities includes heading the functional team and influencing its acts and performance
14. Do you invite others to assess your own performance?
15. Do you place the overall organizational objectives on top of your priorities in a manner clear to the others?

The results from the answers provided by the leadership are as follows:

Current Performance Satisfaction

Dissatisfaction with current performance standards and an accompanying desire to change them is typical in dynamic organizations that are involved in continuous quality improvement. Organizations that are responsive to constantly changing environments require leaders that are not satisfied with the status quo. They are constantly seeking to enhance performance. This question seeks to find the level of dissatisfaction with current standards. The mean score for this question is 3.3524 on a scale of 1 to 5 with 5 being always, 4 being usually, 3 being sometimes, 2 being rarely, and 1 being never. This result suggests that a significant majority of the respondents are upset only some of the time or less with the current performance standards. Out of the 226 responses, 135 were rated at 3 or below and 92 responses were 4 or 5.

Communicated Vision

Effective leaders have a clear and definitive vision as to what performance ought to be and how it can be enhanced to reach that target. This vision has to be communicated to the personnel to help them achieve success. The mean score on this question is 3.7566 out of a 1 to 5 scale suggesting that the respondents feel that they usually communicate the vision for performance to their subordinates. This question had the highest positive response with 152 responses replying usually or always. Only 76 responses were sometimes or less.

Subordinate Competencies

It is important that leaders have a clear understanding as to what is required to do the tasks at hand. Leaders must know what competencies and qualifications are required for the task. They must also know the capabilities of their subordinates in order to provide additional resources if there is a gap between the two. This must not be based on simple intuition or feelings. It should be clearly stated, in writing, as to what is needed and what is available in order to make effective human resource decisions. The mean score on this question is 3.5419 out of a 1 to 5 scale indicating that the majority of the respondents do feel knowledgeable about what is required and what is available to reach the targeted successes. The most positive responses were 129 while 98 indicated little emphasis on competencies, qualifications, and capabilities.

Targets

Good leaders establish targeted goals that are clear, written, and measurable. This is communicated to the subordinates and the expected performance targets and responsibilities are clearly defined. People can achieve what is expected of them if they know what it is. Targeted goals that are vague and ill-defined offer little or no guidance to subordinates. The mean score on this question was 3.4273 on a scale of 1 to 5 and was one of the higher rated questions. However, more than half of the respondents stated that they established targeted goals only sometimes or less. Out of the 227 responses, 115 responded sometimes or less, and 112 responded usually or always.

Challenging Team Objectives

This question builds upon the previous question yet places it in the perspective of teams. Does the leader set ambitious objectives of the team members? A standard for of goal-setting is the MBO (Management by Objectives) approach that allows superiors and subordinates to jointly set objectives for the year. The key to success here is to be sure that the objectives are challenging. Objectives that can be reached with no effort, are not truly objectives. The mean score for this question was 3.3673 on a scale of 1 to 5. This corresponded very similarly to the earlier question. The divide was slightly further apart, however, on the negative side. 120 respondents indicated that they set challenging team objectives sometimes or less frequently, and 106 respondents indicated this was a usual or constant practice.

Direct Performance Appraisal

This is a straightforward question that asks if the leader does face-to-face interviews for the purpose of performance appraisal and records the session. This is an opportunity for the leader to assess the work of the subordinate and provide positive feedback to improve the future performance. It also is an opportunity for a leader to provide inspiration and motivation for the individual by praise and support. Unfortunately, for the majority of the leaders it is a missed opportunity. The mean for this question was 3.2920 on a scale of 1 to 5. 125 of the respondents indicated that they only sometimes or less provided the direct performance appraisal for subordinates, while 102 usually or always did this.

Team Leadership

Providing leadership for teams deliberating strategy and objectives is extremely important. This provides an important focal point for subordinates to see that the leader is committed to the organizational strategy and objectives. By the leader not chairing team meetings, can send a

message of a lack of commitment on the leader's part. The mean for this question was 3.0661 on a scale of 1 to 5. This was one of the three lowest-ranked questions in the survey. 137 respondents indicated that chairing committees dealing with strategy and objectives was not something they usually did. 90 respondents indicated that this was something they did usually or always.

Praise

Good leaders praise the excellent work of their subordinates. They are recognizing the contributions made by the subordinate to the improved performance of the organization. It was clear that the majority of the respondents are involved in praising their subordinates. The mean for this question was 3.4643 on a scale of 1 to 5. 123 respondents indicated they usually or always praised their excellent subordinates, whereas only 101 indicated this was something they did only sometimes or less.

Communication

A good leader is a good communicator. Leaders, more often than not, are gauged by how well they communicate with not only subordinates, but stakeholders as well. Leaders must be tactful so as not to insult others but must be inspirational so to motivate those who follow. The mean for this question was 3.5067 on a scale of 1 to 5. The majority of the respondents, 119, felt as if they were usually or always good communicators. A minority of the respondents, 106, felt as if they were good communicators only sometimes or less.

Outside Assessment of the Team

This question explores whether or not outside assessment of the team is allowed and whether suggestions which are made are actually considered. By allowing individuals outside of the team to routinely examine the performance provides the opportunity for validity for the results obtained. In most large organizations, this is an established procedure that is done routinely. The mean for this question was 3.6171 on a scale of 1 to 5. The majority of the respondents, 135, indicated this was routinely done. Only 87 indicated that this was something less than routine.

Stakeholder Relations

This question asks the leaders about their involvement with customers; specifically, how much time is spent each week meeting with customers and staff. The importance of the customer stakeholder group cannot be emphasized enough. Organizations that fail to realize the value of customer input face many difficulties in today's competitive world, even for municipalities. One

must listen to customers to find out what their needs are and how to fulfill them. The mean for this question was 2.9686 on a scale of 1 to 5. This was the lowest rated question on the survey. The vast majority of the respondents, 155, indicated that 3 hours or less a day were spent in customer stakeholder relations. Only 68 indicated a higher level of involvement.

Personal Leadership Development

Good leadership skills are planned and developed. They do not just happen. Excellent organizations have long recognized the importance of developing their leadership. Numerous efforts at training and education directed at developing leaders within the organization are constantly being done. This question is directed at the individual asking if there is a plan in place and is it checked routinely to determine if the plan is being followed. The mean on this question was 3.0578 on a scale of 1 to 5. This was the second-lowest-rated question. A disappointing majority of 158 respondents indicated little planning being done regarding their personal leadership development. Only 77 respondents indicated that this was something that was done on a regular basis.

Organizational Transformation

Transformation of organizations from their present state to a desired future state of being is commonplace today. Transformational leadership has been recognized as being instrumental in bringing about the desired change. This transformational leadership involves more than just the head of the organization. Individual leaders within the organization must assume the role of transformational leader. This question asks the respondent as to how they view themselves as being involved in that transformational process. The mean score on this question was 3.2063 on a scale of 1 to 5. Only 93 respondents saw themselves as actively involved in the transformational process, while 130 saw themselves as sporadically involved in it.

Outside Assessment of Self

This question relates to an earlier one about outside assessment of the team, only this time it addresses the individual. Due to the nature of the organization of Dubai Municipality, the strong Human Resource Department would have standards established for outside-appraisal of individuals. The mean for this question was 3.5619 on a scale of 1 to 5. 130 respondents said it was customary for outsiders to review them. Only 96 respondents indicated that this was an infrequent occurrence. Both the earlier question and this one were had virtually the same mean score.

Prioritizing Organizational Goals

Leaders in organizations provide examples of behavior for others in the organization. If the leaders do not seem to value an organizational objective, how can they expect the subordinates to do so. Leaders must not only give verbal support for the organizational objectives but they must provide clear, observable support in their day to day activities. This question asks whether or not the respondent does "walk the walk" not just "talk the talk" The mean score for this question was 3.6923 on a scale of 1 to 5. The majority of respondents replied that leaders did provide an example by putting the organizational goals at the top of the list with 132 responses of usually or always. A minority of 89 did not feel as if they did this on a regular basis.

The Leadership Questionnaire reveals a somewhat mixed picture regarding the functioning of the respondents. In general, responses to this survey indicate that the municipality managers only sometimes engage in those behaviors characteristic of top leaders.

The mean scores for the 15 behaviors examined range between a high of 3.76 for having and communicating the vision to subordinates to a low of 2.97 for conducting site visits to enhance communication.

For all 15 of the items combined, the average score is 3.4. This means that only sometimes are the desirable traits outlined in the survey displayed. The highest performing organizations would expect to see scores somewhere between 4 and 5 for the vast majority of the questions. This means that the municipality could expect to see performance gains by working on almost any of the 15 behaviors explored in the survey.

While the mean scores suggest multiple areas for improvement, one of the key weaknesses of municipality teams is revealed through analyzing this data using a Factor Analysis procedure. The varimax rotation was chosen and convergence was achieved. In this procedure, items that are answered similarly are grouped. This grouping is then further analyzed to determine if there is an underlying construct that is represented.

In the case of the Leadership Questionnaire three factors emerge. Items 6, 7, and 13 represent the first factor, 34% of the variance ascertained. They seem to represent a core concept which focuses on the ability of the respondent to assume a dominant leadership position. This is seen as the ability to assume the mantle of leader, be it in employee appraisals, team meetings or transformational leadership. On average, respondents indicated they do these things only sometimes (average score of 3.19). The second factor consists of items 10, 14, and 15, 16% of the variance ascertained. These seem to represent a core concept of formalized authority of the leader. The factor reflects outside review and support of organizational objectives. On average, the respondents indicated they do these things slightly less than usually (average score of 3.62) The final factor consists of items 8 and 9, 9% of the variance ascertained. This factor could be called a communication core concept. Many of the respondents felt as if they were effective communicators in their position (average score of 3.48).

What is more troubling is information from the survey which tends to indicate that many of the respondents are quite satisfied with the status quo regarding performance. They do not perceive problems with current performance standards within the municipality. Additionally, they suffer in the area of customer stakeholders relations, this having received the lowest score of all questions. Finally, the respondents indicated that they do not have a personal plan for the development of their leadership skills.

In summary, the majority of the respondents utilize the formal structure of the organization on which to base their leadership. They avoid difficult and stressful situations in which they might have to make un-favorable decisions. They perceive themselves as good communicators and supporters of the organization. Yet, they minimize their customer interactions. Finally, most do not involve themselves in development of their leadership skills.

CONCLUSION

The results of this survey does not point a picture of what one expect from the leadership within a government organization in a municipality that is considered a marvel of the 21st century. The media has portrayed Dubai as the City of Gold, the new Paris of the Middle East and the Cosmopolitan Center of the Arab World. Yet when one considers Where Dubai Municipality as an organization started and moved to, it is not surprising. It is in the Arab culture which helps define the characteristics of members of the organization (power distance, collectivity, individualism, etc.), the age of the organization and its gigantic size for the region. These all impact the organization. As we look to this ity of Gold as it sits upon the desert sands from the eyes a leadership researcher, it does seem to shimmer like gold or perhaps a mirage.

BIBLIOGRAPHY

Amis, J., T. Slack, and C. R. Hinings, "The Pace, Sequence, and Linearity of Radical Change," *Academy of Management Journal 47*(1)(2004):15-39.

Bass, B. M. (1960) *Leadership and performance beyond expectations.* New York: Harper and Row.

Bass, B. M. "From Transactional to Transformational Leadership: Learning to Share the Vision," *Organizational Dynamics18,(* 3)(1990):19-36.

Bennis, W.G. & B. Nanus (1985). *Leaders: The strategies for taking charge.* New York: Harper and Row.

Cartwright, D. C. (1965). Influence, leadership, control. In *Handbook of organizations,* edited by J. G. March. Chicago: Rand McNally.

Conger, J. A. & R. N. Kanungo (1998). *Charismatic leadership in organizations.* Thousand Oaks, CA: Sage Publications

Galton, R. (1869). *Hereditary genius.* New York: Appleton.

Hemphill, J. K. & A. E. Coons (1957). Development of the Leader Behavior Description Questionnaire. In *Leader behavior: Its description and measurement,* edited by R. M. Stogill and A. E. Coons. Columbus: The Ohio State University, Bureau of Business Research.

House, R. J. "A path-goal theory of leader effectiveness," *Administrative Science Quarterly 16*(1971):321-339.

House, R. J. & G. Dessler (1974). The path-goal theory of leadership: Some post hoc and a priori tests. In *Contingency approaches to leadership* edited by J. G. Hunt and L. L. Larson. Carbondale, IL: Southern Illinois University Press, 29-55.

House, R. J. & T. R. Mitchell (1974). Path-goal theory of leadership. *Contemporary Business 3* (Fall):81-98.

James, W., "Great men, great thoughts, and their environment," *Atlantic Monthly 46*(1880):441-459.

Katz, D. & R. L. Kahn (1966). *The social psychology of organizations.* New York: Wiley.

Lewin, K. & R. Lippit, "An experimental approach to the study of autocracy and democracy: A preliminary note," *Socometry 1*(1938):292-300.

Lewin, K., R. Lippit, & R. K. White, "Patterns of aggressive behavior in experimentally created social climates," *Journal of Social Psychology 10*(1939):271-301.

Locke, E. A., "Guest Editor's Introduction: Goal Setting Theory and Its Application to the World of Business," *Academy of Management Executive 18*(4)(2004):124-125.

Lussier, Robert N. & Christopher F. Achua (2007). *Effective Leadership, (3rd Edition).* Mason, Ohio:Thomson Higher Education

Mintzberg, H., "Leadership and Management Development: An Afterward," *Academy of Management Executive 18*(3)(2004):7-19.

Puffer, "Changing Organizational Structures: An Interview with Rosabeth Moss Kanter," *Academy of Management Executive 17*(4)(2003):53-61.

Provitera, M. J., "What Management Is: How It Works and Why It's Everyone's Business," *Academy of Management Executive 17*(3)(2003):152-153.

.

INTERNATIONAL TRADE FINANCING: THE U.S. VERSUS THE WORLD

Kurt R. Jesswein, Sam Houston State University

ABSTRACT

Much of the history of banking can be traced to banks providing international trade financing. And in today's global economy, a nation's economic strength is closely tied to its ability to compete in the global marketplace. As much of modern commerce relies on the efficient functioning of financial markets, the role of banks providing the financial services necessary for businesses to conduct international business activities can not be overstated. This paper examines recent and historical developments of banks providing international financing services, primarily letters of credit (L/C) and related forms of trade financing, in the United States economy. The role of both domestic (U.S.-based) and foreign banking institutions is examined in light of the size and attractiveness of the U.S. market.

INTRODUCTION

Much of the long history of banking can be traced to banks providing international trade financing (see, i.e., Green, 1989). And in today's global economy, a nation's economic strength is closely tied to its ability to compete in the global marketplace. As much of modern commerce relies on the efficient functioning of financial markets, the role of banks providing the financial services necessary for businesses to conduct international business activities can not be overstated.

More specifically, banks play a very important role in facilitating international trade. Banks not only provide letters of credit (L/Cs), a significant component of the financing that is often necessary in many international trade transactions, but they also act as the primary conduit through which the payments for such transactions flow. Whether providing L/Cs, confirming (guaranteeing) another institution's L/C on behalf of a customer, or simply handling the flow of documents associated with international trade transactions, banks have always been at the focal point of international trade and commerce.

The role of banks is likely critical to the success of smaller companies engaged in international business, the companies that make up the bulk of trade-oriented companies in the U.S. For example, the Department of Commerce reports that large exporting companies (those employing 500 or more workers) are responsible for seventy-one percent of the *value* of U.S. exports but only represent three percent of the *number* of exporters (U.S. Department of Commerce, 2007). This

means that the vast majority of exporters, and by association importers as well, are small– and medium-sized companies.

It is probably safe to assume that many smaller companies engaged in international trade rely heavily on their banks for assistance. Furthermore, because of their small size, many of them likely rely on *smaller* banking enterprises, often referred to as community banks. In fact, due to the strong relationships and personalized services provided by community banks, they remain critical to the success of smaller companies with nearly forty percent of smaller companies using community banks, rather than their much larger money center brethren in New York and elsewhere, for the majority of their financing needs (Bernanke, 2006).

However, in examining U.S. banking statistics, one finds some disturbing trends of apparent disinterest in providing trade financing services on the part of those very same community banks. For example, in 1984 nearly thirty percent of the 7,200 *large* community banks in the U.S. (i.e., those assumed to have the size and clientele necessary to have international services requested of them) provided letter of credit financing, while by the end of 2006 that figure had fallen to less than seventeen percent of the 4,000 large community banks remaining after two decades of consolidation within the banking industry. In fact, much of the slack in providing trade credit appears to be being taken up by foreign banks eager to develop and expand their markets in the U.S. (Ramchander, Reichert & Jayanti, 1999). These foreign banks have been vocal in demonstrating their importance to the economic well-being on the U.S. (Institute of International Bankers, 1997). Even former Federal Reserve Board Chairman Alan Greenspan noted how foreign banks have become important providers of liquidity and depth to the U.S. banking system and how they have become significant sources of credit for all types of businesses throughout the country (Greenspan, 1991)

This paper examines various trends in trade financing activities within the U.S. banking sector, particularly the apparent abandonment of the international banking sector by U.S. banks, or at least the middle-tier thereof. It also looks at the move by foreign financial institutions to fill the gap that this phenomenon has created. Foreign banks have made major inroads to the U.S. banking sector for decades, and are increasingly becoming a factor in the commercial activities, domestic and international, of many U.S. and foreign companies. Their increasing role, along with the decreasing role of the U.S. domestic banking sector, is evaluated.

OVERVIEW OF TRADE FINANCING AND PAYMENT METHODS

Success in international trade can, at a minimum, be measured in terms of an exporter being paid in a timely manner and an importer receiving the goods or services ordered with the correct specifications. To accomplish this, there is a wide spectrum of possible payment schemes that determine the amount of risk taken on by each party. Among the most common terms of payment are payments in advance, letters of credit, documentary collections (drafts), and open accounts.

Due to the inordinate amount of risk taken on by the purchaser, advance payments are relatively uncommon except under special circumstances. A similar argument could be made for the other extreme of exporters providing unsecured financing (open account) following the shipment and/or delivery of goods. Nonetheless, given the competitiveness of the global markets, the majority of international trade transactions are said to be settled via the open account method. However, the risk borne on the sellers under such arrangements may be difficult for many small- and medium-sized businesses to accept. They often rely on a middle road, i.e., letters of credit or documentary collections.

Letters of credit and documentary collections both involve the use of financial intermediation, most commonly the services of commercial banks whose actions provide the conduits through which the rights, obligations, and risks of all participants in the trade agreement are assured. Legal guidelines for conducting such transactions are dictated by the International Chamber of Commerce and published in its *Uniform Customs and Practice for Documentary Collections* (the newest revision of which, UCP 600, was published in late 2006).

Both letters of credit and documentary collections involve the use of a draft, drawn by the seller, requiring that the face amount, either on sight (sight draft) or on a specified date in the future (time draft), be paid, in accordance with its terms, which among other items specify the documents needed before title to the goods passes to the buyer.

The primary difference between the two methods is the party responsible for making payment. For documentary collections, this is usually the importer or purchaser of the goods; under a letter of credit, it is usually the commercial bank providing the letter of credit. Thus, the letter of credit generally provides a higher level of assurance of payment because it is the obligation of a commercial bank rather than a private party. Documentary collections will usually be less expensive but involve the acceptance of additional risk because there is no guarantee of payment as provided under a letters of credit.

Due to the nature of international dealings, including factors such as distance, differing laws in each country and difficulty in knowing each party personally, the use of L/Cs has historically been an important aspect of international trade. It is estimated that approximately fourteen percent of all world trade, nearly $1 trillion in total, is settled through the use of L/Cs (Clark, 2007).

L/Cs are important for exporters and importers alike. For exporters they help ensure the receipt of payment for goods sold in foreign markets. For importers they provide a mechanism by which the acquisition of foreign goods, goods often vitally important to the success of the importer's business activities, can be better facilitated. Therefore, the ability to use L/Cs can be viewed as a significant component of a firm's ability to compete in the global marketplace. This may be especially true for smaller companies that may not have the resources to devote to some of the more arcane aspects of international trade transactions that larger, more sophisticated, firms have at their disposal. They will likely need to rely more on their banks for their international trade and financing needs.

SOURCES OF TRADE FINANCING IN THE U.S.

Globalization has allowed all types of companies, regardless of size, to become participants in the international market. And trade financing is an integral component of this process. To secure help in trade financing, companies have a variety of avenues to pursue. On one hand, there are several government agencies that offer assistance and various resources to companies, particularly smaller and mid-sized ones. This assistance comes primarily from the big three – the Export-Import Bank, the SBA, and the Agriculture Department. Each has its own set of programs but they all focus on providing various credit guarantees and other help to U.S. companies engaged in international trade, making it easier for them to get financial backing from the banking sector. In addition, the Commerce Department, through its nationwide network of Export Assistance Centers, is available to help smaller and mid-size firms deal with the challenges of international trade and commerce.

Whether or not assistance is received from a government agency, companies will still need to receive the bulk of their financing from the banking sector. They will normally first turn to their own bank, since banks are in the business of accommodating their customers when they can. But if the bank does not handle trade financing or if the transaction is too large or complex for the bank to handle, companies are forced to look elsewhere. To meet this need, there are a small but growing number of lenders who have entered the field, specializing in providing trade financing for their own customers as well as to non-customers on a case-by-case basis. Besides the three largest U.S. banks (Citibank, JP Morgan Chase, and Bank of America), this group includes several U.S. regional banks that have found trade financing as a profitable niche business as well as foreign-based banking institutions who often come with long histories of trade financing expertise and are more than willing to "fill the gap."

Within the U.S. market, Citibank, JP Morgan Chase, and Bank of America collectively account for nearly half of the U.S. letter of credit market. Globally, the concentration among banks is even more pronounced, with ten institutions accounting for seventy-five percent of the global L/C market (Barovick, 2005). Other notable players in the U.S. market include national banks such Wells Fargo, Wachovia, The Bank of New York, and U.S. Bank, and major regional players such as National City Bank (Cleveland), Union Bank of California, and Amegy Bank (Houston). Similarly, many foreign banks such as Societe Generale (Paris), Barclays (London), BNP Paribas (Paris), HSBC (London), ABN AMRO Bank (Amsterdam), and Standard Chartered Bank (London) provide letter of credit financing in the U.S. banking markets. In fact, in terms of L/C financing, fifteen of the top twenty-five banks in providing letters of credit in the U.S. are foreign banks. See Table 1 for a listing of the major providers of L/Cs in the U.S.

FOREIGN BANKS IN THE UNITED STATES

Foreign banks operate in the U.S. through a myriad of different organizational forms. Many do nothing more than open representative offices. These offices cannot accept deposits nor make loans (but they can forward payments or loan papers to the home office). A second alternative are agencies, which are allowed to make business loans (such as letters of credit) but can not make consumer loans nor are they permitted to accept domestic deposits. They are usually financed by the parent bank or by borrowings in the Federal Funds or interbank markets. A third choice, albeit a limited one, are investment companies, which are similar to agencies as they cannot accept deposits but tend to focus more on securities dealing than lending activities.

Table 1: Leading Providers of Letters of Credit in U.S.
(amounts in millions)
As of December 31, 2006

1. Citibank	$7,694
2. JPMorgan Chase	$6,415
3. Bank of America	$4,702
4. Wachovia	$1,765
5. Societe Generale	**$1,374**
6. Bank of New York	$1,220
7. BNP Paribas	**$1,209**
8. Barclays	**$1,170**
9. Svenska Handelsbank	**$986**
10. HSBC	**$852**
11. SanPaolo Imi	**$656**
12. Mega International New York	**$508**
13. ABN-AMRO	**$422**
14. U.S. Bank	$417
15. Mega International Los Angeles	**$351**
16. Bank of Tokyo-Mitsubishi New York	**$332**
17. Wells Fargo	$331
18. Standard Chartered	**$325**
19. Wells Fargo HSBC Trade Bank	$309

Table 1: Leading Providers of Letters of Credit in U.S. (amounts in millions) As of December 31, 2006	
20. KBC Bank	**$294**
21. Deutsche Bank	**$292**
22. National City Bank	$287
23. Doha Bank	**$255**
24. Natixis Bank	**$253**
25. Comerica	$249
Note: **Bold** denotes a foreign bank	

Foreign banks are also allowed to establish Edge Act Corporations. These corporations are chartered by the Federal Reserve Board and specialize in international banking activities with a permitted scope of activities similar to those of agencies. Agreement Corporations, a fifth alternative for foreign banks, are state-chartered alternatives to Edge Act Corporations, but are of limited importance or scope.

The most popular form of organization for foreign banking organizations are branches. Like agencies, branches are considered to be an integral part of the parent bank, but unlike agencies they can offer a full range of banking services. Branches of foreign banks can accept domestic deposits and make all types of loans and have become major forces in the U.S. corporate banking markets. A final option for foreign banks is the creation of partially- or wholly-owned subsidiaries. Foreign banks can gain control of a subsidiary either through acquisition of an existing U.S. bank or by establishing a new bank. Subsidiaries have identical banking powers as domestic banks and are therefore regulated as domestic banks.

DATA

The primary data sources used are the Bank Call Reports delivered to the Federal Deposit Insurance Corporation (FDIC) and available for download from the Federal Reserve Bank of Chicago (www.chicagofed.org). Because L/C financing tends to be short-term rather than long-term, quarterly rather than annual reports were used to capture any short-term deviations in the data.

Although the general population of U.S. banks is examined when appropriate, of greater importance are the data on large community banks and on foreign banks. Large community banks are generally defined as institutions having total assets between $100 million and $1 billion (Gilbert & Sierra, 2003; DeYoung, Hunter & Udell, 2004). However, to capture a subset of institutions not often examined, we also include “mid-sized banks” with total assets up to $10 billion (Ennis, 2004)

in our grouping of large community banks. Smaller banks, those below $100 million in total assets, are excluded because they are likely to be too small or too localized to have customers in need of L/C services or lack sufficient resources to devote to such activities. Larger banks, those with total assets of more than $10 billion, are excluded because they tend to have significant international exposures and likely concentrate on serving their large corporate customers rather than the many small- and medium-sized exporters that make up the bulk of internationally-active companies within the U.S.

To allow for better comparability of results given the steady growth in the size of banks over time, we have chosen to arbitrarily exclude the largest (in terms of asset size) one percent and smallest forty-nine percent of banks for each period studied. This is assumed to eliminate the large money center banks on one end and the small community banks on the other. This is based on a review of the data from 2002 through 2006 in which an *average* of 49.0 percent of banks had asset sizes less than $100 million and an *average* of 1.1 percent had asset sizes greater than $10 billion. Thus, fifty percent of the entire population of banking institutions could be defined as large community banks. This fifty percent rate was maintained for all periods covered in this study by eliminating the largest one percent and smallest forty-nine percent of the total amount of banks for each period.

The definition of foreign banks used in this study is the one used by the Federal Reserve Board itself. In providing statistics on foreign banks in the U.S., the Fed includes the following types of institutions: U.S. branches and agencies of foreign banks, including those that are state-chartered, and any U.S. commercial bank with a minimum foreign ownership of 25 percent.

ANALYSIS

Turning attention to the actual situation within the U.S. banking markets, we find that the percentage of community banks providing trade financing in the form of letters of credit has steadily declined over the past decade and a half. Despite the considerable amount of consolidation that has taken place in the banking sector over this time period (when the total number of institutions fell by forty percent from 13,580 to 8,128), the percentage of banks providing letters of credit fell from thirty-five percent to less than seventeen percent.

And it is not only the number of institutions offering letters of credit that is dropping but also the relative amount of financing. Current figures (as of the fourth quarter 2006) show that while nearly half of trade financing comes from the big three (Citibank, JPMorgan Chase, and Bank of America), the 308 foreign banks operating in the U.S. provide an additional 31.6 percent of the total, yet the 3,864 large community banks provide only 6.5 percent! Thus, the explosive growth in international commerce that has taken place in recent history, at least the U.S. component of it, is being finance in large part due to the prowess of foreign banks operating in the U.S.

This apparent abandonment of international finance by community banks comes despite the repeated exhortations from professional bankers for community banks to get more involved due to the profitability of trade financing (Emens, 2006; Streeter, 2006). Yet, except for a handful of globally-active money center banks, and a handful of niche players such as National City and Amegy, the U.S. banking community has allowed foreign banks to grab a significant amount of the financing opportunities that exist in international trade financing. Whether it is the ease with which outsourcing trade financing products to specialist institutions can be made or an unwillingness to venture in to the brave "old" world of international finance, it appears that the vast majority of the middle-market of U.S. banks, the larger community banks, is willing to allow these opportunities to go to others.

CONCLUSIONS

International trade is a significant component of the global business environment. Much of a country's economic strength rests on the shoulders of its ability to compete in the global markets. And while it may be the competitiveness of the products that drives international commerce, there are many aspects of international transactions that must be mastered to be successful. One of these is the efficiency and effectiveness of the payment process, a process that is very closely associated with the magical world of trade finance.

The market for trade financing products, specifically letters of credit, within the U.S. is splitting off in to several directions. In one direction we find the big money center banks, who are devoting significant resources to maintain and embellish their already dominant presence in the market. In another direction, there are a handful of regional and larger community banks that are heeding the call and carving a niche for themselves by moving in to trade financing with a great deal of apparent success. Filling the remaining void left by the disinterest of community banks in providing international services to their valuable business customers are the foreign banks.

Although obviously also interested in servicing their own customers doing business in the U.S., foreign banks have gone after and maintain a significant portion of the overall market for trade financing in the U.S. The activities of foreign banks in the U.S. have helped finance much of the growth of the U.S. economy over the past few decades. Whether the continued reliance on these institutions is advantageous to the U.S. financial and economic system as a whole is yet to be evaluated. Further analysis on the reasons for the shift away from providing international services by the regional and community banks will be useful in formulating a position on how best to meet the future financing needs of the small- to medium-sized companies upon which much of the growth of the U.S. and global economies rests.

REFERENCES

Barovick, R. (2005). Multiple options and sources make trade finance more available than ever, *World Trade*, 18(4), 16-28.

Bernanke, B.S. (2006). Community banking and community bank supervision in the twenty-first century. *Speech, Independent Community Bankers of America National Convention, Las Vegas, Nevada, March 8.* Accessed online on 1 March 2007 at www.federalreserve.gov/BoardDocs/ speeches/2006/20060308.

Clark, T.D. (2007). Revised credit rules impact international business. *ThomasNet Industrial Market Trends*. Accessed 25 January 2007 at news.thomasnet.com/IMT/archives/2007/01/ revised_rules_on_letters_of_credit _ucp600_global_guidelines_practices.html.

DeYoung, R, W.C. Hunter, & G.F. Udell (2004). The past, present, and probable future for community banks. *Journal of Financial Services Research*, 25(2/3), 85-133.

Emens, J.A. (2006). Export finance: a new profit center community banks can't ignore. *Community Banker*, 15(10), 80-82.

Ennis, H.M. (2004). Some recent trends in commercial banking. *Economic Quarterly (Federal Reserve Bank of Richmond)*, 90(2), 41-61.

Gilbert, R.A. & G.E. Sierra (2003). The financial condition of U.S. banks: how different are community banks. *Review (Federal Reserve Bank of St. Louis)*, 85(1), 43-56.

Green, E. (1989). *Banking: an illustrated history*. New York: Rizzoli International.

Greenspan, A. (1991). Statement before the committee on banking, finance, and urban affairs, U.S. House of Representatives (June 11, 1991). Reprinted in *Federal Reserve Bulletin*, 77(8), 644-650.

Houpt, J.V. (1999). International activities of U.S. banks and in U.S. banking markets. *Federal Reserve Bulletin*, 85(9), 599-615.

Institute of International Bankers (1997). *Economic benefits to the United States from the activities of international banks: financial services in a global economy*. New York: IIB.

McLymont, R (2005). Options are increasing for small importers and exporters. *Shipping Digest*, 82 (May 9), 6-7, 12-13.

Ramchander, S., A. Reichert, & S.V. Jayanti (1999). The determinants of foreign bank involvement in U.S. banking markets. *Managerial Finance*, 25(7), 48-63.

Streeter, B. (2006). The future for trade services: bright, cloudy, both. *ABA Banking Journal*, 98(11), 55-5, 58, 77.

U.S. Department of Commerce. (2007). *A profile of U.S. exporting companies, 2004 – 2005*. Washington, DC: U.S. Department of Commerce.

U.S. Small Business Administration (2005). *Breaking into the trade game: a small business guide to exporting (Third Edition).* Washington, DC: U.S. Department of Commerce.

COUNTRY RISK ASSESSMENT: RISK ASSESSMENT OF THE DEVELOPING COUNTRIES

Mohammed Ashraful Haque, Texas A&M University

ABSTRACT

International lending has become an integral part of the major U.S. commercial banks. The recent surge in international lending and rescheduling has created both the opportunity for greater profit and exposure to greater risk.

The purpose of this study was to identify the risk level of each of the developing countries. A total of 70 countries were used, 35 never defaulted and 35 that have defaulted on their international loan. Ten debt indicators were used to develop the discriminant function. Based on this discriminant function a discriminant score was computed for each of the developing countries. On the basis of this discriminant score, each country was ranked from lowest risk to highest risk.

INTRODUCTION

International lending has become an integral part of the major U.S. Commercial banks. The recent surge in International lending and rescheduling has created both the opportunity for greater profit and exposed lenders to greater risk. The prime concern of the international bankers at this particular time, however, is the failure of the developing countries to repay their foreign debts on schedule. This failure was well publicized in August 1982, when billions of dollars in emergency credit was extended to Mexico. Since 1975, the number of countries in arrears on international repayments had risen from 15 to 68 by the end of 2003.

The developing countries are presently moving towards a trend of narrowing the account deficits; however, the problems of Argentina, Bolivia, Costa Rica, Mexico, Brazil, Poland, Romania, Sudan and Zaire are well-publicized. The adverse publicity given to the debt servicing problems of a few countries may have a negative impact on some credit worthy borrowers. It should be noted that developing countries are reducing their deficits in a period of economic difficulty, a fact often overlooked by the lenders. This narrowing is most significant for those developing countries that export manufactured goods.

The developing countries, on the whole, used borrowed funds productively. During the past 30 years, the middle income countries, which include the largest borrowers from private markets among the developing economies, performed far better than the mature industrial countries. The major borrowers, which include Argentina, Brazil, Mexico did not use external borrowed funds to substitute for domestic savings. Their gross domestic saving actually increased. External funds

coming from abroad, therefore, contributed to the increased domestic investment; however all of these major borrowers experienced problems in repaying their loans on schedule due to a sharp rise in inflation in the non-oil developing countries, mostly attributable to the huge oil price increase between 2003 and 2005.

Presently, data relating to the credit worthiness of a country are commonly put into the form of ratios which are used as indicators of future debt servicing capabilities. This paper uses these debt indicators as used by the World Bank to discriminate between countries which are likely to default and countries which are likely not to default. Country risk is defined as the overall political and financial status in a country and the extent to which these conditions may affect the ability of a country to repay its debt. Debt indicators resemble the leading economic indicators used to forecast business cycles in that they contribute measurement without much underlying theory but, nonetheless are widely watched.

PURPOSE OF THIS STUDY

According to the World Bank the medium and long term indebtedness of the developing countries and territories amounted to more than 2 trillion dollars at the end of 2004. According to World Bank data the majority of this amount is indebtedness of public entities or is guaranteed for repayments by a public sector with government guarantees. A major part of the lending to developing countries is by U.S. Commercial banks whose claim on non-OPEC developing countries mounted to 8 percent for their total assets and 149 percent of their total shareholders capital. The potential threat to solvency from developing countries default is greater for the nine largest U.S. banks because their loans to the non-OPEC developing countries were 222 percent of their total capital, and their loans to Argentina, Brazil and Mexico were 113 percent of their capital. None of the banks which have been lending to the developing countries is closing its doors or reorganizing as a result of the defaults in those countries. But such upheavals are not idle fears and would surely materialize in the absence of enlightened self-interest on part of both borrowers and lenders.

The primary objective of this study is to develop a quantitative model to evaluate country risk based on discriminant analysis and rank the developing countries from lowest to highest risk. This will help lenders identify the risk of lending to each country.

LITERATURE REVIEW

According to rankings published twice a year by Euromoney, country risk has increased in general (excluding Central and Eastern Europe) since the inception of the study in 1993. Hayward states this is contrary to the assumption that country risk has decreased due to advances in technology fostering the free flow of information and capital. Euromoney ranks countries according to measures of political and economic factors.

Evidenced by the rankings, all Middle Eastern countries experienced an overall increase in risk which may be credited largely to increased political instability despite other problems. While African countries such as Sudan and Mauritania increased their rank immensely, the majority experienced declines which she states are a result of reliance solely on agriculture. The Majority of Asian nations experienced similar increases in risk attributable to slowing economies as a result of "a decrease in demand in the industrialized nations and continuing oil price increases." In Latin America and the Caribbean, economic problems outweighed political improvement to create an overall decline in rank for the area.

In contrast, Central and Eastern European nations encountered risk declines most likely due to the high risk ratings in early studies as a result of political and economic instability of the new nations. Western Europe and North America showed the least amount of aggregate risk change since the study's inception, most likely due to a long history of economic and political soundness. Sweden climbed the most while France fell to the bottom of the list. (Hayward, 2005)

The private sector, specifically banks and investment firms, are the largest source of investment financing in the global marketplace. Risk managers within those entities have the difficult but important task of determining credit-worthy recipient of a finite amount of investment capital. Vojta and Adams contend that an effective method of assessing country risk is based on a 12-point system devised and monitored by the Financial Stability Forum (FSF) housed by the Bank for International Settlements (BIS). According to the Forum, the standards are divided into three functional categories: macroeconomic policy and data transparency, institutional and market infrastructure, and financial regulation and supervision. The standards are defined and measured by a multitude of organizations including the Basel Committee on Banking Supervision (BCBS), the International Monetary Fund (IMF), the World Bank, the Organization for Economic Cooperation and Development (OECD), and the International Accounting Standards Board (IASB).

The authors assert that by using the ranking system and information conveyed by the FSF, risk managers are able to price their products appropriately, providing discounts to countries that maintain high standards and charging a risk premium for those whose practices fall short. By obeying basic macroeconomic principles, the private sector can use "the power of the purse" to convince nationalities to abide by the twelve standards and enhance their business practices.

In addition, four areas for further action to persuade conformance to the standards. First, it is stated that the private sector must be well-informed on the international standards and how nationalities comply with them. Second, the financial enterprises must thoroughly examine the business practices of the entities for which they provide financial capital. Third and fourth, by using information ascertained through the first two methods, risk managers are able to and would be prudent to discriminantly price products commensurate with findings. (Vojta, Adams 2003)

The International Country Risk Guide (ICRG), published monthly by the PRS Group, provides a composite risk assessment rating for 140 countries regarding three aspects: the current political climate, economic data, and financial data. Each country is rated regarding a multitude of

components and how they compare to a hypothetical 'perfect' country. "This [perfect] country has a perfect democracy with full democratic accountability, a homogenous society with no ethnic or religious tensions, and enjoys a free-market economy, limited only by the need to pursue sound public finances and attract responsible investment." The composite score for the theoretical ideal country is 100 and denotes the least amount of risk. As scores decline, more total risk is assumed. The author states that the ICRG ranking is valuable because in addition to providing a measure against the perfect country it also provides a country's rank relative to the other 139 countries.

Not only does the ICRG provide a static current rank for each country, but it also provides one and three-year forecasts. Each forecast includes 'best case,' 'worst case,' and "most likely scenarios. The PRS staff continually monitors changing factors of all countries and updates the guide monthly as needed (Sealy, 2000)

For a multitude of reasons, determining country risk has become more difficult in recent years. Lowenstein cites reason such as constantly changing political environments, increased securitization of national debt, off-balance-sheet activities, and the growing access to world finance. While most analysts include both economic and political factors when determining risk, there is no consensus on what importance each should carry. Some believe economic factors are the main determinants of risk while others believe the political environment outweighs any economic aspects. Regardless of the methods used, most financial institutions agree that risk analysis is a useful tool for determining creditworthiness.

Because financial institutions find the information useful, most have developed methods and strategies customized to their own needs which can be quite complex. Large US banks typically have varying specific methods but all seem to set certain parameters for exposure with each individual country, depending on the risk rating given to that country. Most US banks allow almost unlimited access to financing to countries that score in the lowest risk category. They also generally have a high-risk category where no activity is allowed to countries who earn that rating. Some banks meet as frequently as three times per year to make risk assessments; while others meet only annually.

European bank ranking methods tend to be less complicated than the US bank systems. However, European banks seem to follow the US pattern of allowing unlimited credit to non-risk clients and restricted access to high risk countries. The European banks are inclined to focus on countries that fall in the middle tiers who offer a higher risk-return ratio.

It is indicated that Japanese banks are still developing risk assessment methods and will not discuss current procedures. It is however stated that Japan usually makes a decision twice a year. (Lowenstein, 1992)

Low-income countries are finding it increasingly beneficial to obtain sovereign credit ratings in order to boost private sector financing previously limited by what Lehman states as "ill-defined or poorly enforced property rights, inadequate accounting information, and inefficient judiciary systems." He also cites lack of access to international financial markets and other problems common

of poorly developed legal systems and of weak business and financial practices. Lack of access to capital restricts development of poor nations. Recently, the most common sources of capital to poor nations are foreign direct investment through acquisition and short-term financing through suppliers. Unfortunately for low-income nations, these sources usually entail loss of management control or higher financing costs.

An increasingly important credit assessment figure is that of a nation's commercial debt and likeliness of default or rescheduling, compiled by such agencies as Moody's, Standard & Poor, and Fitch Ratings. These ratings are important because they not only assess sovereign risk, but provide insight to the risk rating of financial institutions and large companies operating within the nation itself. Lehman states that sovereign ratings are developed through examination of a "broad range of criteria, including...structural factors impeding the functioning of markets, political stability, resilience to external shocks, prospects for economic growth and the health of the financial system." Obtaining a credit ranking benefits the nation because it increases information available to investors and decreases or possibly eliminates what Lehman calls the "Africa premium". Presence of credit rankings also encourage private financing which can aid the country's economic growth. (Lehman 2004)

A SYNOPSIS OF EUROMONEY'S METHODOLOGY FOR ITS QUARTERLY COUNTRY RISK RATING

Political Risk:	25%; subjective analysis based on the risk of non-payment for goods and services; trade-related finance, etc.
Economic Performance:	25%; based on a Euromoney poll of economists
Debt Indicators:	10%; using World Bank data, the value from the following formula: Total debt stocks/GNP + (debt service exports x 2) - (current account balance/GNP x 10)
Rescheduled or defaulted Debt:	10%; value of rescheduled debt/debt stocks
Credit Ratings:	10% scores based on ratings from Moody's, S&P, etc.
Bank Finance availability:	5%; percentage of GNP that private loans comprise
Short-term finance availability:	5%; OECD, US Exim Bank, and NCM UK information
Capital market availability:	5%; information from debt and loan syndicates
Forfeiting discount:	5%; information from Morgan Grenfell Trade Finance and West Merchant Capital Markets

During the 70's total external debt of developing countries were less than 100 billion dollars; however in the 90's it increased to over a trillion dollars. Multinational banks were lending money to the developing countries for the prevailing condition in the financial market. Credit demand was lower, increased competition in the domestic market, development of Eurocurrency deposits, banks were eager to develop a relationship with some of the leading developing countries. Mexico, Brazil and Argentina received more than half of the loans extended to non-OPEC developing countries.

For many developing countries foreign loans were necessary because domestic savings was not sufficient, the needed funds to generate income and exports. They used borrowed funds to meet their short term current account deficits. There were also political reasons for borrowing, politicians needed to achieve a certain degree of economic growth to satisfy its people. Because of this bank lending grew rapidly at 20 to 25 percent until early 80's. Bankers were not concerned about the risk because interest rates were below the economic growth rate of the developing countries. International banks continued to lend money because the export growth rates were above the interest rates and therefore they did not worry about the debt to export ratio. Therefore borrowing countries were not carefully evaluated for risk.

Country risk may be defined as "the likelihood that a sovereign borrower may be unable or unwilling to fulfill their debt obligation either because of financial or political reasons." The risk of lending to a sovereign government is great because legally there is basically do nothing against a sovereign borrower because when a sovereign government is unable to pay, it hampers the private sector; private sector is unable to borrow any further. P.J. Nagy defines country risk as "the exposure to a loss in cross-border lending caused by events which are at least to some extent under the control of the government of the borrowing country." Transfer risk is when private sector borrowers are unable to service their debt due to actions of the government are also part of country risk. An example would be, a private firm may be generating sufficient funds in local currency to pay off debt, if the government decides to devalue the currency, then it become difficult for the private firm to pay off its foreign currency obligation.

Most of the methods developed for country risk analysis were developed in the early and late 70s when cross boarder lending was at its peak. Different methods include from simple qualitative approach to sophisticated statistical methods. Some of the methods are Country Evaluation Reports which includes political risk and country risk studies. Another method used is Qualitative Country Spread Sheet Analysis, which basically evaluates political factors and various economic factors such a growth in GDP, Per Capita GDP, unemployment rate, inflation rate, etc., country risk checklist systems and questionnaires: A checklist which has many questions and statistical indicators, pertaining to borrower country credit worthiness. Quantitative methods include simple statistical rating system, discriminant analysis, logit analysis, principal component analysis and econometrics models. [Tarzi, 1997]

Stable functioning of the credit system is essential to the growth of capitalist economy because credit provides the funds necessary for the expansion of existing economic facilities. If the

lenders are assured that the loan will be repaid, it creates value in process and credit money is established. Because of this, it is necessary to develop a good credit rating system.

METHODOLOGY

It is preferable to have a method which provides a "risk-profile" of a country and identifies a country as being either likely to default or not likely to default. Discriminant analysis is such a method.

Discriminant analysis classifies (a set of) objects (entities, items) into K distinct populations The classification is made on the basis of a set of variables which are such that the values of these variables indicate to which population the object (in this case a country) belongs. In order to apply discriminant analysis it is then necessary to define an appropriate set of populations and to determine variables which discriminate between these populations. The classification is based on a set of K-1 discriminant function (number of functions is one less than the number of categories or one less than the number of discriminating variables, whichever is less). The discriminant analysis technique shows the best discriminating function by maximizing the between group variance and minimizing variance within the group.

The null hypothesis being tested is that the means of the groups of countries likely to default and not likely to default are equal. Based upon the contribution of each independent variable, discriminant analysis will weigh and linearly combine the best discriminating variable so that the separation of the groups is maximized. The joint distribution of the values of the independent variables will be peaked for a particular group compared to the distribution of the same values for all groups combined.

Discriminant analysis is the most appropriate statistical method when the dependent variable is categorical (nominal or non-metric, in this case either likely to default and not likely to default, and the independent variables are metric. The following assumptions are made:

> Multi-variant normality of distribution and unknown (but equal) dispersion have been assumed. This means that the predictor variable scores are independently and randomly sampled from a population of scores and that the sampling distribution of any linear combination of predictor variables is normally distributed.
>
> Equal a priori group probabilities and known dispersion have been assumed. All countries included in the sample have an equal prior probability of being a member of one of the two categories.

Previous studies have been done where discriminant analysis was used to put countries into three risk categories, high risk, medium risk and low risk. It has been found that discriminant analysis is the perfect model to separate groups and put them into categories. (Haque, 1985)

THE GENERAL MODEL

The general model consists of a set of discriminant functions. A discriminant function is a linear equation in the following form:

$$Z=W_1X_1 + W_2 X_2 + ……..+ W_nX_n$$

Where Z is the discriminant score, known also as the cutting or criterion score, the discriminant score of a country is compared against this criterion score to determine the country's risk category.

W is discriminant weight, the absolute value of the discriminant weight assigned to each variable determines the contribution of the independent variable (larger weight indicates greater contribution); and X equals the independent variables.

The sample consists of 70 countries, 35 countries have defaulted on their loans and 35 countries never defaulted on their international debt repayment. The independent variables are as follows:

X_1=EDT/XGS(%) = Total external debt to exports of goods and services (including workers remittances)
X_2 = EDT/GNI(%) = is total external debt to gross national income
X_3= TDS/XGS(%) = also called debt service ratio; is total debt service to export goods and services.
X_4 = INT/XGS(%) = is total interest payments to export of goods and service (including workers' remittances.)
X_5 = INT/GNI(%) = in total interest payments to Gross National Income.
X_6 = RES/EDT(%) = is international reserves to total external debt.
X_7 = RES/MGS (month) = is international reserves to imports of goods and services.
X_8 = short term/EDT (%) = is short term debt to total external debt.
X_9 = concessional/EDT(%) = is concessional debt to total external debt.
X_{10} = multilateral/EDT (%) = is multilateral debt to total external debt.

These are all debt indicators used by World Bank.

RESULTS

The discriminant analysis gave the following results. It can be written in the following form:

$$Z = .0X_1 + .002X_2 +.046X_3 - .423 X_4 - 076X_5 + .006X_6 + .195 X_7 + .042X_8 - .009X_9 + .024X_{10}$$

The Eigenvalue was .657 for function/which is a measure of the importance of the discriminant function. This indicates about 66 percent of the variances exist in the discriminating variables included in the model. The necessary function is one less than the number of independent variables or one less than the number of categories, whichever is less. In this instance, with two risk categories, and ten independent variables, one discriminant function is derived. Wilks lambda ranges from 1 to 0. The function has a Wilk's lamda of .603. The greater the reduction in the Wilk's lambda, the greater the contribution of the independent variables.

Based on discriminant function and the equation each developing country's scores were calculated for the latest year data were available from Global Development Finance published by the World Bank. Based on the discriminant score, each country was ranked from lowest risk to highest risk. The cut off score is zero. The variable total interest payment to exports of goods and service make the greatest contribution followed by international reserves to imports of goods and services.

Table 1: Ranking of Developing Countries Not Likely to Default

Rank	Country	Discriminant Score
1	Botswana	9.723
2	China	3.750
3	Lithuania	3.680
4	Guinea Bissau	3.445
5	Algeria	3.423
6	Guinea	3.312
7	Mauritius	2.462
8	Fiji	2.409
9	Latvia	2.138
10	Liberia	2.060
11	Samoa	2.037
12	Slovak Republic	2.026
13	Belarus	2.013
14	Venezuela	1.829
15	Oman	1.795
16	Mongolia	1.729
17	Czech Republic	1.725
18	Trinidad and Tobago	1.722
19	Yemen	1.564
20	Nepal	1.552
21	Jordan	1.470

Table 1: Ranking of Developing Countries Not Likely to Default		
Rank	Country	Discriminant Score
22	Tanzania	1.420
23	India	1.417
24	Guatemala	1.304
25	Uganda	1.284
26	Thailand	1.205
27	Comoras	1.193
28	Lesotho	1.157
29	Vanuatu	1.154
30	Argentina	1.142
31	Somalia	1.097
32	Sudan	1.032
33	Poland	.976
34	Morocco	.930
35	Albania	.887
36	Kyrgyk Republic	.870
37	Armenia	.866
38	Hungary	.834
39	Solomon Islands	.800
40	Bhutan	.791
41	Maurintania	.787
42	Malaysia	.769
43	Maldives	.742
44	Bulgaria	.722
45	Ghana	.711
46	Indonesia	.657
47	Burkina Faso	.648
48	Pakistan	.642
49	Chile	.610
50	St. Lucia	.601
51	Mali	.600
52	Macedonia	.599
53	Barbados	.597
54	Paraguay	.594
55	Costa Rica	.593

Table 1: Ranking of Developing Countries Not Likely to Default		
Rank	Country	Discriminant Score
56	Mozambique	.590
57	Honduras	.557
58	Swaziland	.554
59	Bolivia	.544
60	Croatia	.535
61	Kenya	.518
62	Egypt	.493
63	Rwanda	.478
64	Kazakhstan	.465
65	Bosnia/Herzegovina	.460
66	Equatorial Guinea	.436
67	Moldova	.425
68	Togo	.421
69	Estonia	.389
70	Guyana	.337
71	Chad	.311
72	Azerbaijan	.300
73	Bangladesh	.293
74	El Salvador	.291
75	Romania	.290
76	Ukraine	.280
77	Columbia	.278
78	Cape Verde	.266
79	Nigeria	.252
80	Uruguay	.232
81	Cote D'Ivorie	.192
82	Tonga	.182
83	Lao PDR	.170
84	Lebanon	.104
85	Haiti	.088
86	Malawi	.063
87	South Africa	.024
88	Serbia	.010

Table 2: Countries Likely to Default		
Rank	Country	Discriminant Score
89	Turkey	-.005
90	Myanmar	-.023
91	Ethiopia	-.076
92	Niger	-.081
93	Senegal	-.094
94	Seycheller	-.119
95	Burundi	-.146
96	Papua New Guinea	-.160
97	Dominica	-.167
98	Nicaragua	-.189
99	Cambodia	-.251
100	Sao Tome and Princi	-.284
101	Uzbekistan	-.290
102	Sri Lanka	-.295
103	Mexico	-.322
104	Syria	-.328
105	Madagascar	-.330
106	St. Vincent and Grenadines	-.388
107	Philippines	-.402
108	Peru	-.457
109	Tunisia	-.460
110	Benin	-.468
111	Vietnam	-.476
112	Congo Republic	-.514
113	Dominican Republic	-.520
114	Jamaica	-.523
115	Cameroon	-.550
116	Tajikistan	-.570
117	Angola	-.572
118	Brazil	-.617
119	Gabon	-.673
120	Sierra Leone	-.745
121	Georgia	-.750
122	Central African Republic	-.880

Table 2: Countries Likely to Default		
Rank	Country	Discriminant Score
123	Zimbabwe	-1.048
124	Congo Democratic	-1.131
125	Gambia	-1.287
126	Eritrea	-1.322
127	Zambia	-1.571
128	Grenada	-1.684
129	Panama	-1.810
130	Djibouti	-1.920
131	Ecuador	-2.219
132	Belize	-2.621
133	St. Kitts and Nevin	-2.859

CONCLUSION

Country risk assessment is very important for all international lenders. It can be seen that there is no real pattern of the level of risk based on the size of the economy. Botswana with a very small economy ranks as the lowest risk developing country whereas China with a big economy ranks second. Other than China most of developing countries with lower risk are smaller economies. For international lenders country risk is crucial because the interest rate they charge on international loans can be adjusted to risk. This study includes only financial variables to assess country risk. Further study could be done to include political risk and social risk. This model was a purely quantitative model. Political risk and social risk may be quantified an included in a quantitative model. A unique thing about this model is that it can used to rank the countries using the latest data.

REFERENCES

Alexander, Lehmann (September 2004). Sovereign Credit Ratings and Private Capital Flows to Low-Income Countries, *African Development Review*, 16(2).

Country Risk: Cautious Optimism on World Economy (March 2001). *Euromoney* (383).

Euromoney Publications PLC (1999).

Hair, Anderson, Tatham, Black. *Multivariate Data Analysis* (Fourth Edition). Prentice Hall Publishing.

Haque, Mohammed A. (1985) Developing a Model for Evaluating Country Risk in International Lending using Discriminant Analysis. Doctoral dissertation, Mississippi State University.

Hayward, Chloe (September 2005). How the World Got More Risky, *Euromoney*, 36.

Lowenstein, Jack (September 1992). How to Rate a State, *Euromoney*.

Mambrito, Fulvia & Yener, Demir (Fall/Winter 1984). An International Debt Repayment Problem Prediction Model for New England Based Financial Institutions, *The Northeast Journal of Business and Economics*, 11(1).

Nesvetailova, Anastasia, (July 2005). United in Debt: Towards a Global Crisis of Debt Driven Finance, *Science and Society*.

Ruckdeschel, Fred B. (Winter 1975). Risk in Foreign and Domestic Lending Activities of U.S. Banks, *Columbia Journal of World Business.*

Sancehz, Arnau J.C. (1982). *Debt and Development.* Praeger Publishing.

Tarzi, Shah M. (Winter 1997). Country Risk Analysis, International Banking and the Developing Countries, *The Journal of Social, Political and Economic Studies.*

Vaaler, Paul., McNamara & Gerry (November/December 2004). Crisis and Competition in Export Organizational Decision Making: Credit Rating, *Organizational Science.*

William, R.C. (December 1983). Recent Multilateral Debt. Restructurings with Official and Bank Creditors, IMF, Occasional Paper.

World Bank (2005). Global Development Finance.

STOCK RETURNS OF DEVELOPED AND EMERGING MARKETS OF EUROPE

Jayen B. Patel, Adelphi University

ABSTRACT

The aim of this paper is to compare the performance of European stock markets with that of the U.S. market. Our results indicate that the emerging stock markets of Europe generated consistently higher returns than did either the U.S. or the developed markets of Europe during different sub-periods from January 1995 to July 2007. We further demonstrate that emerging markets of Europe provided significant diversification benefits to U.S. investors during each of these sub-periods. We therefore conclude that U.S. investors could have increased portfolio returns by allocating some proportion of their investments to the emerging markets of Europe.

INTRODUCTION

Many investors from developed countries invest a portion of their portfolios in emerging stock markets. Generally, investors believe that emerging stock markets generate higher returns and also exhibit greater volatility when compared with stock markets of developed countries. Some researchers have observed that investing in individual emerging markets can be risky for investors from developed countries, so that investors from developed countries should invest in a cross-section of emerging market indices in order to moderate the volatility of returns.

The recent collapse of communism in the Soviet Union and Eastern Europe has created additional opportunities for investors from developed countries. Political transformations in these countries have also translated into substantial economic changes as these economies have moved towards privatization and liberalization. Those advocating greater investment in the equity markets of these developing countries base their advice on the notion that these economies will expand more rapidly than those of other emerging economies because the emerging economies of Europe have superior infrastructure and regulation, compared to other emerging economies. Alternatively, skeptics express concern that the Eastern European countries are subject to political instability and, therefore, these equity markets are very risky.

In this paper, our objective is to compare returns of the U.S. stock market with those of both emerging and developed markets in Europe, and we investigate whether the stock markets of Europe present diversification benefits to U.S. investors during various time periods. Our analysis indicates that the emerging markets of Europe provide higher returns as well as substantial diversification

benefits to U.S. investors. These results remained remarkably consistent over various time periods, and were most notable during the recent period of reduced returns in the U.S. market.

Our study is organized as follows. In the next section, we review some selected literature relevant to our study. The following section describes the data utilized in our study. Empirical findings are reported in the subsequent section. Finally, the concluding section summarizes the findings of our study.

LITERATURE REVIEW

Barry, Peavy III and Rodriguez (1998) examined emerging capital market performance for the period December 1975 to June 1995. They indicate that emerging country stock indices have become an important asset class for investors from developed countries, noting that it is commonly believed that emerging markets produce higher returns and greater risk compared to markets of developed countries. However, the authors were unable to conclude that emerging markets generated returns higher than U.S. market returns during the period of their study. They did, however, find that emerging stock markets exhibited greater volatility and provided diversification benefits when combined with portfolios of developed market stocks.

Tokat and Wikas (2004) demonstrate that emerging market investments provide opportunities to increase portfolio returns. They believe that, in the long run, emerging markets are expected to experience faster economic growth than developed countries, translating to higher corporate earnings and market returns. Investors from developed countries can therefore participate in emerging markets' economic growth by investing in these markets. The authors found that emerging markets generated higher risk-adjusted returns than did developed markets for the overall period of their study, 1985 to 2003. However, this relationship was not consistent over shorter time intervals.

Bekaert, Erb, Campbell and Viskanta (1998) state that previous research demonstrates greater returns and volatility for emerging markets compared to developed markets, as well as lower correlations with developed markets. However, it is important to note that emerging markets are exposed to more shocks from regulatory changes, exchange rate fluctuations, and political crises than are developed markets. Also, the distribution characteristics of emerging markets change over time and standard normality tests such as Kolmogorov-Smirnov tests reveal that return distributions for many emerging markets exhibit substantial deviations from normality.

Dunis and Shanon (2005) examined capital market integration between the emerging markets of south-east and central Asia and the developed markets of the U.S., U.K. and Japan over the period August 1999 to August 2003, and found that emerging markets continue to offer diversification benefits to investors in developed countries. Further, they recognize the possibility that some emerging markets have become more integrated with developed stock markets than others.

However, investors can re-allocate funds to those emerging markets which are less integrated with developed markets.

Patel (2003) examined the relationship between the U.S. stock market and ten emerging markets of Asia, and confirmed that correlations between individual country indices of Asia and the U.S. market had generally increased in the later years of his study. However, he found that some Asian emerging markets were less integrated with the U.S. stock market than others. Specifically, he demonstrated that the South Asian markets of India, Pakistan and Sri Lanka provided greater diversification benefits to U.S. investors than did other emerging Asian markets.

Hassan, Haque and Lawrence (2006) observe that the demise of communism in the Soviet Union and Eastern Europe has led to enhanced investment opportunities for investors from developed countries. They further report that the new political environment has led to liberalization, modernization, and privatization in these economies, resulting in increased capital inflows to these countries. For the period 1988 to 2002, they examined diversification benefits derived by investors in the U.S. and U.K from investing in seven individual European emerging stock markets. These authors conclude that European emerging stock markets have greater potential for higher returns than do those of other emerging stock markets because infrastructure and regulation in these countries are more closely linked to those of developed countries than they are to those of other emerging markets. Additionally, higher educational levels coupled with lower salary levels in eastern European countries, when compared to those of developed countries, make investment in these countries advantageous for investors from developed countries. They add that capital mobility has increased volatility in these markets, which also exhibit some form of volatility clustering. They also found that two of the seven markets they examined show significant time varying risk premiums.

Peavy III (1997) indicates that it is beneficial to invest in emerging stock markets because of their relatively high returns and overall diversification benefits. However, many investors are cautious about investing in individual emerging markets because of the high volatility of returns in these markets. He states that annual standard deviations of returns in some emerging markets can exceed 50%, which can be quite concerning even for the most aggressive investor. He adds that, although individual emerging markets exhibit higher volatility of returns, investments in a cross-section of emerging markets possess a moderate degree of risk.

We conclude from some selected research that emerging market investments are now an important asset class in the portfolios of investors from developed countries. Some individual markets provide better diversification benefits than others, while the volatility of individual emerging markets can be substantially greater than volatility in the developed counterparts. Therefore, investors may want to consider including a cross-section of emerging market investments in their portfolio. In the next section, we briefly discuss the data used in our study.

DATA

We collected monthly index values for three stock market indices from the Standard and Poor's (S&P) web site. Each of the stock market indices is reported in U.S. currency, and is a part of the S&P/Citigroup Global Equity Indices dataset. Specifically, we collected index values for the last trading day of each month for the following three stock indices:

1. The United States stock market index. This broad market index covers over 3000 U.S. companies and therefore represents the overall U.S. stock market.

2. The Developed Europe stock market index. This index is a combination of aggregate stock indices of the following developed European countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom.

3. The European Emerging stock market index. This index is a combination of aggregate stock indices of the following emerging European countries: the Czech Republic, Hungary, Poland, Russia and Turkey.

Data for the two developed stock market indices, i.e. the U.S. stock index and the Developed Europe stock index, were available from July 1989. However, data for the European Emerging stock index were available beginning with December 1994. Therefore, we collected monthly index values for each of the three indices from December 1994 to July 2007, and utilized the standard procedure to calculate monthly returns. Consequently, we computed returns for each of the three indices from January 1995 through July 2007, resulting in 151 monthly returns for each index.

EMPIRICAL RESULTS

We initially compare monthly returns for the three stock indices for the overall sample period of our study, January 1995 to July 2007. For this period, the U.S. stock market index generated a mean monthly return of 1.03 percent, which was lower than the mean return for the Developed Europe index (1.16 percent). Remarkably, the mean monthly return for the Emerging European index during the same period was 2.47 percent.

While these results clearly indicate that it would have been advantageous for U.S. investors to invest in the European markets over the period of our study, we also find that standard deviation of returns for the developed markets of the U.S. and Europe is substantially less than that of the emerging European market. Our initial results indicate that both groupings of European stock

markets, i.e., developed as well as emerging markets, present investment opportunities for U.S. investors.

Table 1: Mean Monthly Return Percentages of Standard and Poor's Global Stock Indices			
January 1995 to July 2007			
Index	Mean	Std. Dev.	N
U.S. Stock Index	1.03	4.16	151
Developed Europe Index	1.16	4.16	151
European Emerging Index	2.47	8.59	151

In order to determine whether these returns are normally distributed, we utilize Kolmogorov-Smirnov (K-S) test statistics. Each of the three stock indices has insignificant K-S Z values, so that we are unable to reject the null hypothesis of normality for each of the three indices.

Table 2: Kolmogorov-Smirnov Normality Test			
January 1995 to July 2007			
Index	K-S Z Value	Sign.	N
U.S. Stock Index	1.04	0.232	151
Developed Europe Index	1.07	0.204	151
European Emerging Index	0.91	0.376	151

It is not surprising to find that the return distributions for the indices for the developed markets in the U.S. and Europe are normal. We note that the European Emerging index is an aggregate of several individual emerging European indices. It is plausible that this aggregation reduced volatility relative to the volatility of the individual country indices comprising the emerging market index. Our analysis also indicates that the distribution of returns for the European Emerging stock index is normal. Consistent with common practice, we present our results regarding statistical significance based on both parametric as well as non-parametric test statistics. However, in subsequent discussion we focus primarily on results from the parametric tests. In the next table, we conduct statistical tests to determine specifically whether the European indices generate statistically significantly higher returns than the returns for the U.S. index.

In Table 3, we present significance test results for comparison of the U.S. stock index with each of the two European indices. We utilize pair-wise parametric T-tests as well as non-parametric Wilcoxon Signed Ranks test statistics. Our results indicate that, for our overall time period, mean monthly return for the U.S. stock index is not statistically significantly less than the mean monthly return for the Developed Europe stock index. However, the mean return for the U.S. index is

statistically significantly less than the mean for the Emerging European index. Consequently, we see that it would have been advantageous for U.S. investors to invest in the emerging markets of Europe over our study period.

Table 3: Significance Comparison Tests of U.S. Stock Index With Other Two Stock Indices

January 1995 to July 2007

	T-Statistics				Wilcoxon Signed Ranks Test	
Indices	Mean Dif.	T-Value	Sign.	DF	Z-Value	Sign.
U.S.-D.E.	-0.13	-0.59	0.55	150	-1.04	0.30
U.S.-E.E.	-1.43	-2.49	0.01**	150	-2.74	0.01**

** Significant at the 0.01 level.
D.E. is Developed Europe Index
E.E. is European Emerging Index

Our results indicating diversification benefits to U.S. investors from investing in European emerging markets are reinforced by our calculation of correlation coefficients between the U.S. index and the European indices. These results, utilizing parametric Pearson correlation coefficients as well as non-parametric Spearman correlation coefficients, are presented in Table 4.

Table 4: Correlation Tests of U.S. Stock Index With Other Two Stock Indices

January 1995 to July 2007

Index	Pearson Coefficients	Spearman Rank Coefficients	N
U.S.-D.E.	0.788**	0.726**	151
U.S.-E.E.	0.575**	0.479**	151

** Significant at the 0.01 level (2-tailed).
D.E. is Developed Europe Index
E.E. is European Emerging Index

The U.S. stock index has a lower correlation with the European Emerging index than it does with the Developed Europe index. The results are consistent with both parametric and non-parametric tests. As reported in earlier studies, the primary purpose of investing internationally is portfolio diversification, particularly during periods of domestic economic downturns. Additionally, earlier studies indicate that correlations among national stock markets have increased over time. In order to further investigate this phenomenon, we next divide the overall sample into three sub-periods.

The first sub-period covers the five-years from January 1995 to December 1999, a period when the U.S. stock market generated relatively high returns. It is informative to evaluate the performance of other markets during this period. Our second sub-period covers three years, January 2000 through December 2002, when U.S. market returns were not only substantially lower than during the previous decade, but were in fact negative. We are particularly interested in ascertaining how foreign markets performed during this tumultuous period for the U.S. equity market. Ideally, as a U.S. investor, one would hope to find that foreign markets generated positive returns during this period. The third sub-period is the recent time period, January 2003 to July 2007, during which the U.S. market rebounded and generated positive returns. But, more importantly for this study, we are interested in analyzing whether the European markets continue to provide diversification opportunities during this period. Numerous prior studies have indicated that world markets are becoming more integrated, thereby reducing diversification benefits to U.S. investors. The results of this analysis are reported in Table 5.

Table 5: Mean Monthly Return Percentages of Standard and Poor's Global Stock Indices

Three Sub-periods			
Index	Mean	Std. Dev.	N
Panel A: Jan. 1995 to Dec. 1999			
U.S. Stock Market	2.09	4.10	60
Developed Europe Index	1.77	3.52	60
European Emerging Index	2.53	9.66	60
Panel B: Jan. 2000 to Dec. 2002			
U.S. Stock Market	-0.99	5.44	36
Developed Europe Index	-1.16	5.25	36
European Emerging Index	1.13	8.69	36
Panel C: Jan. 2003 to Jul. 2007			
U.S. Stock Market	1.20	2.58	55
Developed Europe Index	2.03	3.44	55
European Emerging Index	3.26	7.23	55

The mean monthly return for the U.S. index was 2.09 percent during the first sub-period (January 1995 through December 1999), which was greater than the return for the Developed Europe stock market index (1.77 percent). Interestingly, the Emerging European stock market index generated a 2.53 percent mean monthly return during this period. As expected, volatility, as measured by standard deviation, was substantially greater for the Emerging European stock index (9.66%) than for either the U.S. index (4.10%) or the developed Europe index (3.52%).

Especially interesting are the results of our analysis for the second sub-period, January 2000 through December 2002, when the mean monthly return for the U.S. stock market was -0.99 percent and the European developed markets also generated negative returns (-1.16 percent). Consequently, it would not have been advantageous to invest in the developed markets of Europe during the period when the U.S. markets performed poorly. However, the mean monthly return for the European emerging markets was positive (1.13 percent) during this period. It is particularly crucial for domestic investors to invest in foreign markets which earn positive returns when the domestic market experiences negative returns. For U.S. investors, investing in the emerging European markets would have been beneficial during this critical time period.

During the third sub-period (January 2003 to July 2007), the U.S. equity markets rebounded, earning a mean monthly return of 1.20 percent, while the European market indices generated substantially higher returns than did the U.S. stock market. During this recent period, the Developed Europe stock market index mean monthly return was 2.03 percent while the Emerging European stock market index generated a substantial return of 3.26 percent per month. It therefore seems that, even when the U.S. market generated relatively high positive returns during this recent sub-period, U.S. investors would have benefited significantly from investment in the European equity markets.

Table 6: Significance Comparison Tests of U.S. Stock Index With Other Two Stock Indices

Three Sub-periods						
	T-Statistics				Wilcoxon Ranks Test	
Indices	Mean Dif.	T-Value	Sign.	DF	Z-Value	Sign.
Panel A: Sub-period 1 (Jan.1995 to Dec. 1999)						
U.S.-D.E.	0.32	0.81	0.42	59	-0.69	0.49
U.S.-E.E.	-0.44	-0.44	0.66	59	-1.05	0.29
Panel B: Sub-period 2 (Jan. 2000 to Dec. 2002)						
U.S.-D.E.	0.17	0.34	0.73	35	-0.13	0.90
U.S.-E.E.	-2.12	-2.04	0.05**	35	-1.79	0.07*
Panel C: Sub-period 3 (Jan. 2003 to Jul. 2007)						
U.S.-D.E.	-0.82	-3.26	0.00***	54	-2.95	0.00***
U.S.-E.E.	-2.06	-2.29	0.03**	54	-2.15	0.03**

***, **, * Significant at the 0.01, 0.05, 0.10 level.
D.E. is Developed Europe Index
E.E. is European Emerging Index

In Table 6, we present the results of significance tests for comparisons between each European index and the U.S. index during each of the three sub-periods. In the first sub-period (January 1995 to December 1999), the U.S. stock index generated a higher return than the Developed Europe index, with a mean monthly return difference of 0.32 percent. Conversely, the U.S. index generated lower returns than the European Emerging stock index, with a mean monthly difference of 0.44 percent. However, these differences were not statistically significant during this time period.

During the second sub-period (January 2000 to December 2002), the mean monthly return for the U.S. market was negative (-0.99%), as was the return for the developed markets of Europe (-1.16%). However, this difference was not statistically significant. In contrast, the mean monthly difference between the return for the European emerging markets during this time period and the return for the U.S. market (2.12 percent) is statistically significant. Clearly, it would have been beneficial for U.S. investors to invest in the emerging markets of Europe during this period of negative returns in the domestic equity market.

The U.S. stock market rebounded, generating positive returns in recent years. In Table 6, panel C, we present the results for the three indices during the third sub-period of positive returns. Mean returns for each of the European indices were greater than mean returns for the U.S. index, and the mean differences in returns are both statistically significant. In recent years, it would therefore have been beneficial to invest in the European markets, emerging as well as developed.

In Table 7, we present correlation statistics for the three sub-periods. Prior studies report that correlation coefficients between the U.S. market and international markets have increased in recent years, so that, over time, it has become relatively less advantageous to invest in international markets. For the developed markets, this pattern is replicated in our study as the correlations between the U.S. index and the Developed Europe index increased from the first sub-period (0.682) to the second (0.846). As we reported earlier, correlations have typically increased when international stock markets perform poorly, which was the case during our second sub-period when the U.S. index as well as the developed European markets generated negative returns. In the third sub-period, the Developed Europe index correlation with the U.S. index (0.843) was nearly identical to that of the second sub-period (0.846).

Perhaps the most interesting results of our study, and potentially the most advantageous observations for U.S. investors, are seen in the change in the correlation coefficient between the U.S. stock index and the European Emerging index over time. One the one hand, the correlation coefficient increased from the first sub-period (0.609) to the second sub-period (0.703). During the second sub-period, as reported earlier, returns for the U.S. index were negative, and statistically significantly less than the returns for the European Emerging stock index, so that U.S. investors would have derived a clear benefit from investing in the European emerging markets during this time. However, the more interesting results are observed in the change in the correlation coefficient from the second sub-period to the third, when the correlation coefficient between the U.S. index and

the European Emerging index actually declined substantially from the second sub-period (0.703) to the third (0.387). This result contrasts with the conventional belief that correlation coefficients among international markets have increased over time.

Table 7: Correlation Tests of U.S. Stock Index With Other Two Stock Indices

Three Sub-periods			
Index	Pearson Coefficients	Spearman Rank Coefficients	N
Panel A: Sub-period 1 (Jan. 1995 to Dec. 1999)			
U.S.-D.E.	0.682**	0.560**	60
U.S.-E.E.	0.609**	0.465**	60
Panel B: Sub-period 2 (Jan. 2000 to Dec. 2002)			
U.S.-D.E.	0.846**	0.863**	36
U.S.-E.E.	0.703**	0.718**	36
Panel C: Sub-period 3 (Jan. 2003 to Jul. 2007)			
U.S.-D.E.	0.843**	0.780**	55
U.S.-E.E.	0.387**	0.299*	55

**, * Significant at the 0.01, 0.05 level (2-tailed).
D.E. is Developed Europe Index: E.E. is European Emerging Index

SUMMARY AND CONCLUSIONS

We examined stock market returns for three indices, namely, the European Emerging stock index, the Developed Europe stock index, and the U.S. stock index. As expected, we found that the developed markets of Europe are more highly integrated with the U.S. stock market than are the emerging markets of Europe. We also found that the returns for the emerging markets of Europe were consistently greater than returns for both the developed markets of Europe and the U.S. market. These results indicate that, despite growing international capital market integration, emerging stock markets of Europe continue to provide important return and diversification benefits to investors of the developed world.

ACKNOWLEDGMENTS

I would like to thank R. Bruce Swensen for helpful comments and suggestions.

REFERENCES

Barry, C. B., J. W. Peavy III and M. Rodriguez (1998). Performance Characteristics of Emerging Capital Markets, *Financial Analysts Journal*, 72-80.

Bekaert, G., C. B. Erb, H. R. Campbell and T. E. Viskanta (1998). Distributional Characteristics of Emerging Market Returns and Asset Allocation, *Journal of Portfolio Management*, 24 (2), 102-116.

Dunis, C. L. and G. Shanon (2005). Emerging markets of South-East and Central Asia: Do they still offer a diversification benefit? *Journal of Asset Management*, 6 (3), 168-90.

Hassan, M. K., M. Haque and S. B. Lawrence (2006). An Empirical Analysis of Emerging Stock Markets of Europe, *Quarterly Journal of Business and Economics*, 45 (1 and 2), 31-52.

Patel, J. B. (2003). Inter-Temporal Relationship Between the U.S. Stock Market and the Emerging Markets of Asia, *Journal of Business and Economics Research*, 1 (10), 1-6.

Peavy III, J. W. (1997). Emerging Markets: Time to Invest? *Emerging Markets Quarterly*, 1 (3), 40-48.

Standards and Poor's Website. www.globalindices.standardandpoors.com.

Tokat, Y. and N. Wicas (2004). Investing in Emerging Stock Markets, *The Journal of Wealth Management*, 7 (2), 68-80.

THE ECONOMICS OF OUTSOURCING IN A DE-INTEGRATING INDUSTRY

Jawaid A. Ghani, Lahore University of Management Sciences
Arif I. Rana, Lahore University of Management Sciences
M. Khurrum S. Bhutta, Ohio University

ABSTRACT

Many large firms in low scale economy industries are actively considering outsourcing options, in the face of competition from smaller more efficient players. A framework is developed for determining which set of products and activities to outsource and which to keep in-house supported by review of the theoretical literature and case-studies of outsourcing decisions at two large vertically integrated footwear manufacturers in Pakistan. The framework suggests activities being considered for outsourcing be evaluated in terms of level of proprietary knowledge, economies of scale, inefficiencies of vertical integration, transactional costs, and the existence of reliable vendors. It is suggested that activities with low levels of proprietary knowledge and activities where cost savings due to outsourcing justify the increased transaction costs, should be outsourced.

INTRODUCTION

An important problem in supply chain management is to decide which set of capabilities to develop among partners and which to develop in-house. This decision impacts the strategic issue concerning the location of key resources within the supply chain network. Literature suggests that for a chain to successfully compete against other chains, such resource development decisions be made so as to optimize across the chain rather than from the point of view of any individual player (Christopher, 1998).

Developing and managing supply chains in emerging markets is becoming increasingly important as firms position themselves to take advantage of global outsourcing to low income countries. Emerging markets are dominated by low scale economy industries, such as textiles, leather and light engineering. However, supply chains in many low scale economy industries in emerging markets remain suboptimal due to activities being performed within larger firms, even though better alternatives are available through outsourcing. High levels of vertical integration are often common in the early stages of industrial development. As markets develop, government policies change, technology diffuses, and new competitors emerge, large firms are forced to evaluate outsourcing options.

Reduction of transaction costs has been identified as an important objective of supply chain management, and the analysis of transaction costs provides a useful theoretical basis for the study of supply chain management (Ettlie & Sethuraman, 2002; Holstrom & Roberts, 1998). Based on a case-study of outsourcing practices and de-integration in Pakistan's footwear industry, and concepts from transaction cost economics, a framework is developed for determining which set of products and activities to outsource and which to keep in-house. The framework is of relevance not only to large firms developing supply chains, but also to small and medium enterprises (SMEs) as they consider expansion decisions. Given the significant impact of government policy on vertical integration/de-integration decisions, the findings are also relevant to policy makers concerned with development of SME networks.

The following section enumerates factors leading to vertical integration, followed by a section on the discussion on drivers of de-integration. Based on these discussions, Section 4 lists the key determinants of which products and activities are best outsourced and which are best kept in-house. Section 5 presents a case study of vertical integration and recent de-integration in Pakistan's footwear industry with examples of considerations affecting outsourcing decisions. Section 6 proposes a 'framework' for making outsourcing decisions and also enumerates some ideas for future research.

DRIVERS OF VERTICAL INTEGRATION

Multiple factors contribute to the establishment and continued existence of large integrated firms despite inherent inefficiencies. These can be described in terms of reduced costs, weak supply networks, increased market power, and government policy. These factors are important during the early stages of an industry, and particularly important during early stages of economic development.

Cost Reductions

Integrated firms have a cost advantage over smaller firms by avoiding transaction costs in imperfect markets, particularly during early stages of market development. According to (Hennart, 1993), transaction costs include 'the cost of measuring output in all of its dimensions and the consequence of not measuring it perfectly'. These include the costs of writing, monitoring and enforcing contracts with supply chain and other partners. Supply networks in early stages of development are characterized by imperfect markets resulting in high transaction costs. Such costs are further amplified under conditions of specialized assets, complexity, uncertainty, and information asymmetry. These costs apply not only to transactions with suppliers but also with customers. It is for this reason that larger firms are more able to become suppliers to global firms. Integrated firms avoid the high transaction costs often associated with activities requiring highly specialized assets. In such cases the costs that arise are related to writing, monitoring, and enforcing

contracts where specialized assets makes each party vulnerable to the other (Khanna & Palepu, 1999). Outsourcing activities that require specialized assets can result in opportunistic behavior, thereby increasing the risk to the partners. For instance, an activity may require highly specialized equipment that cannot be used for any other purpose or for another customer. A supplier would be reluctant to invest in the equipment since if the buyer decides not to continue the outsourcing arrangement; the supplier would be left with an asset that has no alternate use. Such specialized assets can take various forms including physical assets such as equipment, human assets involving specialized training for the activity, and location in order to lower transportation and inventory costs. The need for specialized assets particularly arises when the industry is young or where new technology is being introduced. Firms pioneering a new market or technology may be unable to find suppliers willing to take the risk of investing in the specialized assets required to undertake the activity, or may simply prefer to appropriate the benefits of the innovation by keeping the new technology in-house. Integrated firms also avoid the high costs of writing contracts in situations with high uncertainty and high information exchange requirement (Winger, 1994), and the costs of enforcing contracts where the legal environment for contract enforcement is weak. In a study of 600 durable goods manufacturing companies in 20 countries, it was found that shorter frozen schedules (implying higher levels of uncertainty) were significantly correlated with low levels of (global) outsourcing. (Ettlie & Sethuraman, 2002)

Vertically integrated firms also benefit from reduced costs through economies of scale, improved capacity utilization, decreased labor costs due to learning curve, lower raw material procurement costs, etc. (Porter, 1985). The highly integrated Ford Motor Company utilized scale economies of mass production to provide better value at a lower price and thereby achieved market dominance (Langlois & Robertson, 1989). These cost reductions are particularly significant in continuous process and assembly lines industries resulting in high scale economies. The vast integrated East India Company in the 1700s, with its own fleet of ships, army, and diplomatic corps was able to obtain spices and other goods at better prices (Chaudhuri, 1981), while the large integrated American textile firms in the 1800's, were better able to obtain steady supplies of consistent quality yarn compared to smaller scattered firms (Tucker, 1984).

Offensive Market Power

Large integrated firms are better positioned to develop markets for new products due to increased access to resources (financial, human, technology) and bargaining power (Harrigan, 1985). Such firms are able to build on their market knowledge to identify niches, develop premium products and technology, invest in marketing efforts, and establish distribution networks. Furthermore such firms commit the necessary resources to ensure consistent quality thereby building brand equity.

The highly integrated Bird's Eye, pioneered the frozen food industry by developing a raw material supply network, introducing new harvesting and freezing technologies, building product

awareness, and establishing specialized warehousing, transportation and retail equipment for handling frozen foods (Collis, 1992). A study of the Mexico's footwear industry found that larger integrated firms were more innovative in terms of process and production technology, while smaller firms were limited by unstable supplies, had little knowledge of the export market, and generally earned lower profits. (Rabellotti, 1993)

Government Policy

Large integrated firms are better positioned to influence and benefit from government policy. In early stages of industrial development capital, labor, and product markets as well as the regulatory environment are poorly developed, and hence governments in emerging markets have greater control over the allocation of resources. For instance, in the 1970s about 85 percent of Chile's financial assets were state owned, labor markets were controlled by government-affiliated unions, and government set price levels (Khanna & Palepu, 1999). Larger firms in such emerging markets benefit from government policy and inefficient capital markets, and gradually become more vertically integrated and horizontally diversified (conglomerates). Indeed papers such as (Williamson, 1975) identify vertical integration as evidence of intermediate (such as supply networks) markets failure and conglomerates as evidence of capital market failure.

In the 1960s the Korean government as part of its Economic Development Plan gave preferential treatment to major business groups through subsidized loans despite high inflation (Chang & Choi, 1988). Small manufacturers usually face high capital costs, or inadequate capital. The high cost of capital to small firms can be traced to high cost of administering these loans (Little, Mazumdar & Page, 1987). Up until late 1980's, India government policy heavily regulated the establishment of new industries, restricted access to foreign exchange, and imposed high import tariffs. As a result conglomerates flourished. For instance, the Tata Empire with 230,000 employees in 95 companies dominates industries ranging from steel and trucks to software and power generation (Ellis, 2002).

In conclusion, large vertically integrated firms are likely to emerge in high scale economy industries, in situations where markets are imperfect, where government intervention is high, and where premium products are being pioneered.

DRIVERS OF DE-INTEGRATION

The previous section describes reasons for the existence of large integrated firms. However as markets develop, as knowledge diffuses, and as government influence on markets decrease, large firms in low scale economy industries face pressures to de-integrate. In such industries, smaller suppliers are often more flexible, specialized and avoid the inefficiencies generally prevalent in the

larger integrated firms due to shirking and labor costs. Hence it is expected that to the extent possible, activities should be outsourced rather than conducted in-house.

There is considerable evidence, both theoretical and empirical, to support the assertion that outsourcing results in lower production costs and overheads. The classic paper by Stigler (Stigler, 1951), built on Adam Smith's theorem that the division of labor is limited by the extent of the market, argued that as markets develop, specialization increases and drives vertical de-integration. Specialization also results in economies of doing a limited set of activities. Strategically, the specialized supplier focusing on a few core technologies and markets would build a richer base of relevant knowledge. A study of nineteenth century American and English textile industry found that specialized firms were able to produce higher value products (Temin, 1988). Lall (1980) found that major Indian truck manufacturers outsourced components involving technologically dissimilar areas (such as electrical, glass, rubber). Furthermore these truck manufacturers outsourced "specialized products (like pistons, fasteners, fuel injection) to large independent producers who serve the whole industry to reap economies of scale". Finally specialized firms, because of their smaller size have greater hiring and firing flexibility and are able to respond faster to changing markets and technologies (Harrigan, 1985).

Researchers such as (Mahoney, 1992) identify three major reasons for why firms do not integrate: increase in production, bureaucratic issues, and strategic costs. Specialized suppliers with a larger customer base would be able to achieve full economies of scale in their production technology, and also be less constrained by capacity imbalance, compared to the integrated firm. Integration increases the size of the firm, which results in additional hierarchical levels, bureaucracy, and even deliberate distortions to achieve divisional objectives. The availability of captive internal markets reduces direct competitive pressures on intermediate products, thus increasing slack. Hennart (1993) refers to these as shirking costs, which he describes as: 'the cost of managing is the cost of directing and observing behavior and of failing to do it perfectly'.

The supply chain literature contains numerous examples of advantages gained through outsourcing. In 1990, Toyota subcontracted about 70 percent of its manufacturing, using over 30 thousand suppliers. General Motors, on the other extreme, sourced 70 percent of its parts in-house. Consequently, Toyota was able to assemble a car in half the time, and with minimal inventory (2 days versus 2 weeks), while development time was also half that of U.S. competitors (Womack, Jones & Roos, 1990). It is thus not surprising that when Chrysler began its turnaround in the late eighties, it started by overhauling its supplier network, from 2500 to a lean long-term nucleus of 300. The benefits of outsourcing are not confined to the auto industry. Based on a survey of 3185 manufacturing lines of business in over 200 industries, it was found that integrated firms had significantly higher production costs, than specialized firms (D'Aveni, Richard & Ravenscraft, 1994). While surveying textile manufacturing units in various parts of the world, Little et al. (1987) point out that wages in larger units are probably twice those in small establishments even after controlling for skill differences.

WHAT NOT TO OUTSOURCE

The previous section identifies industry conditions where de-integration represents the most efficient structure for organizing the supply chain. As a general rule firms facing such conditions should outsource their activities and develop supply partners. However, it is suggested that firm-level activities involving proprietary knowledge and high transaction costs (the latter due to high levels of product demand uncertainty and requirements for specialized assets) are best retained in-house.

Activities Involving Proprietary Knowledge

Considerable literature exists suggesting that certain activities are to be recognized and treated as "core competencies" of the firm. Such core activities need to be developed as part of a strategic plan and resources committed accordingly. An important characteristic of core activities is propriety knowledge. This includes knowledge related to production and marketing, and resides mostly within the firm. In terms of the resource based theory, firms are characterized by resource heterogeneity which leads to competitive advantage and consequent rents (Mahoney, 1992; Moran & Ghosal, 1999). Economic value is created through resource deployments, particularly through new resource combinations resulting in the development of new products and services. The knowledge component of core activities often provides high rents and hence has attracted considerable research attention (Schoonhoven, 2002). Hence core activities involving propriety knowledge generally should not be outsourced. For instance, Cummins Engine Company retains the production of strategic component families in-house, except where the company does not have the resources or time for the required investment (Venkatensan, 1992).

Activities Involving High Transaction Costs

As discussed in the earlier section on drivers of vertical integration, outsourcing activities requiring specialized assets and high levels of uncertainty may result in opportunistic behavior and thus higher transaction costs related to contract writing and monitoring. These specialized assets may take the form of specialized equipment, location, or human resources required for new product development and meeting stringent quality and delivery requirements.

In the next section we explore the forces that led to the establishment of these two large integrated players, the forces which now are leading to de-integration, and detailed examination of specific instances of outsourcing choices. In the process we test the applicability of the theoretical literature presented in the previous sections.

FOOTWEAR CASE-STUDY

Pakistan, with a population of 140 million (growing at percent per annum), has a footwear market of above 150 million pairs/year. There are three distinct classes of suppliers to this market, i.e., the informal sector, the small manufacturers, and large integrated units. The informal sector consists of over 17,000 units, each with an average of two employees. Firms in this sector generally pay no taxes, and predominantly sell non-branded shoes through cobbler-shops. In addition, there are about 500 small manufacturers who distribute through wholesalers or their own outlets. Finally there are two large integrated manufacturers, with almost 20 percent share of the market, and sell through their own national distribution network. Both of these firms have recently started outsourcing selected product lines and are actively developing supply networks.

Early Vertical Integration

Bata (Pakistan) was established in Batapur (near Lahore) in 1942 as a branch of Bata of British India in Batanagar (near Calcutta), as part of Bata International headquartered in Toronto, Canada. Bata (Pakistan) became an independent firm after the partition of British India in 1947. Service Industries was established in Gujrat in 1954. Though Bata (Henceforth Bata (Pakistan) will be referred to as Bata and Service Industries will be referred to by its brand name 'Servis') is almost twice the size than Servis (10% versus 6% share of market), both followed almost identical strategies. Both were vertically integrated firms, with company owned leather tanneries, shoe manufacturing, and retail network. Both had built strong brands by providing reliable quality shoes at affordable prices, and through extensive advertising particularly during Eid festivals and school openings. Smaller non-integrated manufacturers with limited access to quality raw material, reliable distribution networks, low cost capital and imported technology, were unable to compete against Servis and Bata.

Access to consistent and high quality leather is essential to producing reliable shoes. Quality leather tanning involves a complex production process, imported chemicals, and expensive equipment. In 1947, with only five tanneries in Pakistan, an efficient market for quality leather did not exist and thus not allowing smaller manufacturers access to the raw material necessary for producing quality shoes.

In the initial years Servis followed Bata's distribution strategy by simply opening a store right next to a Bata store. In 2005, Servis and Bata had 277 and 375 retail outlets (mostly in rented properties), respectively. Both had recently been expanding the number of outlets by 8-10 every year (Along with expanding their distribution, Bata and Servis were also planning to launch new retail formats). Both benefited from an inefficient market for property which allowed low rents to continue for decades despite double digit inflation. Small manufacturers without access to such

retail networks were dependent on distribution systems controlled by wholesalers who often defaulted or delayed payments.

Smaller players also lacked access to low cost capital and imported technology available to the larger players in the 1960's. At that time, the government through an extensive industrialization plan provided selected access to capital and licenses which were required for importing equipment. The smaller players neither had the political clout of the Servis nor the multinational influence wielded by Bata to benefit from government policy.

Gradual De-Integration

During the 1980s the leather and footwear industries expanded, several new players entered the value chain, and the market for intermediate products became more efficient. Smaller non-integrated manufacturers gained increased access to quality raw material, to low cost capital, to imported technology, and to distribution networks. These smaller players generally had lower operating costs and at times developed specialized expertise. In the late nineties Bata and Servis were facing increased competition from these smaller firms as well as imported footwear, and were actively developing supply networks to remain competitive.

During the eighties, remittances from migrant workers in the Middle-East together with the Afghan war resulted in 6 percent annual GNP growth and increased consumer spending. The increased market size was accompanied by a three-fold increase in retailers and catalyzed a three-fold growth in the number of footwear manufacturers during 1982-88 (Government of Pakistan, 1988).

In addition to increased market access, smaller footwear manufacturers gained access to improved sources of raw material, technology and capital. During the period 1981 to 1992 the number of tanneries tripled (from 180 to 509), making quality finished leather widely available to footwear manufacturers. The increase in tanneries was a direct consequence of increased leather exports, caused by widespread closure of tanneries in Europe resulting from ecological concerns. Changes in the global leather industry provided local tanners access to inexpensive used equipment and technology from their international customers. Furthermore both tanners and footwear manufacturers gained from government de-regulation which decreased tariffs on imported equipment and raw material, and gave increased access to capital.

As a result of the changed economics of vertical integration during the eighties, both Bata and Servis started a process of de-integration in the late 1990s. Bata diversified out of leather tanning in 1996, and embarked on a program to increase outsourcing. The overall plan is to increase outsourcing to specialized vendors and not to vendors who manufacture multiple lines (caused due to vendors diversifying in response to erratic demand/uncertainty). During this period, while Bata sales was roughly the same, its labour force decreased by 20 percent. In 1965, the marketing and distribution division of Servis was formed into a separate company: Service Sales Corporation

(SSC). In 1998, SSC became an autonomous body and by 2002, SSC had increased the value of products being procured from outside the Servis group to 30 percent.

Outsourcing at Servis & Bata

In 2005, both Servis and Bata carried about 1500 Stock Keeping Units (SKUs) each, grouped broadly into six product categories. Each of these six categories is characterized by different production technologies, and market characteristics (see Table 1). The production technologies vary from processes like 'lasted stuck-on sole' which involve labor intensive stitching, to complex, capital intensive process like 'Direct Injection' for producing Joggers. Market characteristics for each product category also vary in terms of demand stability, quality and price sensitivity. As shown in Table 1 and discussed below, the outsourcing decision for each product category by Servis and Bata, also varies depending on scale economies, transactional costs (due to specialized assets and demand uncertainty), and proprietary knowledge.

Women Sandals & Slippers involve low scale economy technologies. These shoes are produced with 'stuck-on sole technology', using labor intensive stitching processes (10 pairs/worker/shift) and inexpensive technology (Rs 0.3 million). Despite the high demand uncertainty associated with fashion items, transaction costs of outsourcing are low, making contracts easy to write and enforce. The low transaction costs are due to low requirements for specialized assets since the technology and skills are widely diffused. Furthermore, any proprietary knowledge regarding new product development is more available with smaller specialized players. The combination of low scale economies, low transaction costs, and minimal proprietary knowledge has resulted in Women Sandals & Slippers being one of the first choices for outsourcing by both Servis and Bata.

Men Moccasins have production characteristics similar to Women Sandals & Slippers. However the larger lot size (because of greater volume for a given SKU) allows for assembly line manufacturing, resulting in higher scale economies. Also, the longer product life cycle of Men Moccasins result in more stringent quality requirements. The generally lower production quality of the small players makes enforcing standards more difficult (high transaction costs). The scale economies and quality requirements has resulted in much of the production for this category being done inhouse. The recent growth of the industry and diffusion of quality stitching equipment has made it easier to monitor and enforce contracts for quality products. This lowering of transaction costs had made outsourcing of Men Moccasins a viable option for both Bata and Service.

Production of PVC Slippers requires a more capital intense process ('injected plastic technology' equipment worth Rs 3 million) compared to the two product categories discussed above, and faces a stable, price-sensitive market. In recent years a few new firms have developed the specialized expertise in the handling of equipment and chemicals required for PVC production. These firms due to their scale economies, specialized assets (human and equipment) and proprietary

knowledge have become the leading suppliers in this product category to not only Servis but also the wholesale market. However, Bata has not moved out of PVC production yet, and is still producing slippers that are priced significantly higher (but sell in the premium segment) than those available elsewhere.

Table 1: Product Production, Market and sourcing for different Product Categories

	Product Category			
	Women Sandals & Slippers		Men Moccasins	PVC Slippers
	Thongs (Hawaii)	Canvas Shoes	Joggers	
Production Technology	Lasted Stuck-on Sole	Lasted Stuck-on Sole		Injected Plastic
	Expanded Sheet	Build-up (vulcanized)		Direct Injection
Equipment cost	0.3 m	1 m	3 m	2 m
	5 m	5 m-40 m		
One Shift capacity	80-100 pairs	400 Pairs	800 pairs	5,000 pairs
	1,500 pairs	300-500 pairs		
No. of Workers / shift	30	15	10-15	10-15
	70	50		
Process Complexity	Simple	Simple	Medium	Medium
	High	High		
Process Knowledge	Diffused	Diffused	Diffused	Propriety
	Propriety	Propriety		
Lead Time	15-30 days	15-30 days	10 days	10 days
	60-90 days	30-90 days		
Demand Stability	Fashion Shoes	Stable	Stable	Stable
	Stable	Stable		
Mkt Price Sensitivity	High	Medium	Medium	High
	High	Medium		
Mkt Quality Reqt.	Medium	High	Medium	Low
	Medium	Medium-High		
Servis	Outsourced	In-house & Outsourced	Outsourced	In-house
	In-house	In-house		
Bata	Outsourced	In-house & Outsourced	In-house[4]	In-house
	In-house	In-house		

[4]but some production outsourced during peak season

Production of thongs is similar to PVC slippers in terms of relatively high scale economies and level of expertise required. Market is price sensitive and the quality requirement is even lower than PVC. In such a case, with low levels of proprietary knowledge, and low levels of demand uncertainty, transaction costs are expected to be low, and as a result thongs would be more efficiently produced through outsourcing to smaller specialized manufacturers. Interestingly enough both Servis and Bata continue to produce thongs in-house, although for a short period Servis had outsourced thongs. Though production and marketing characteristics of thongs are conducive to outsourcing, specialized quality producers have not emerged, making outsourcing unviable for Servis and Bata. The reason may be due to the lack of an efficient market for the raw material for thongs (expanded foam sheets which are produced in-house by Servis and Bata) compared to the more efficient raw material market for PVC.

Canvas Shoes are produced through a complex 'vulcanization' process which is even more capital intensive (equipment cost Rs 5 million) than any of the technologies described above, making both scale economies and transaction costs high. Furthermore the technology is proprietary (has not diffused beyond Servis and Bata). As a result, consistent with theory, both Servis and Bata produce canvas shoes in-house. Like Canvas Shoes, the production of Joggers also involves a complex, capital intensive process, and involves proprietary knowledge which has not diffused widely. Thus, like canvas shoes, and consistent with theory, both Servis and Bata produce Joggers in-house.

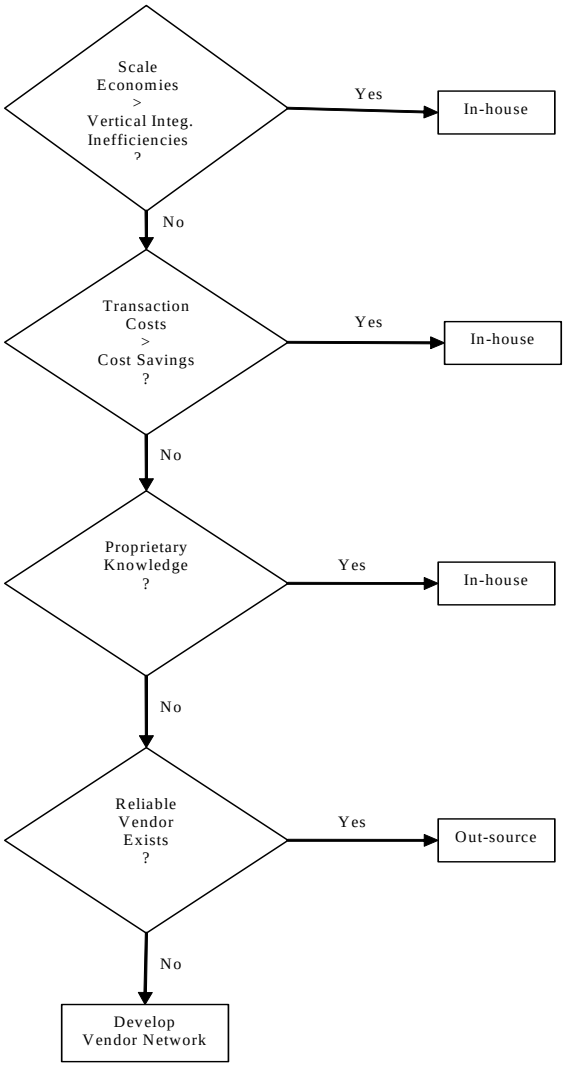
FRAMEWORK FOR MAKING OUTSOURCING DECISIONS AND FUTURE RESEARCH

An analysis of the theoretical literature on vertical integration and supply chain management, together with evidence based on outsourcing decisions by major integrated footwear manufacturers in Pakistan, suggests a framework for making such decisions (see Figure 1). This framework is adapted from a framework developed earlier by the authors of this paper for outsourcing in industrial clusters [8]. The framework suggests activities being considered for outsourcing should be evaluated in terms of five key aspects: level of proprietary knowledge, economies of scale, inefficiencies of vertical integration, and transactional costs, and the existence of reliable vendors. Thus, it is suggested that a firm considering activities for outsourcing should undertake the following steps:

Cost Savings:	Identify potential vendors, and compare in-house versus vendor costs (difference due to in-house scale economies and inefficiencies of vertical integration).
Transaction Costs:	If a significant difference exists between in-house and vendor costs, estimate the potential transactional costs of outsourcing (in terms of costs of opportunistic behavior where specialized assets are involved, costs of exchange of tacit knowledge, and other overheads involved in contract writing, execution and enforcement).
Proprietary Knowledge:	Estimate the impact due to diffusion of proprietary knowledge if activity is outsourced.

Reliable Vendors: If cost savings due to outsourcing justify the transaction costs, together with any strategic considerations, assess vendor reliability and outsource. If reliable (quality and delivery) vendors do not exist, invest in vendor development.

Figure 1: Framework for Making Out-Sourcing Decision



The framework developed in this paper, while based on strong theoretical foundations, and needs to be further validated in the context of other low-scale economy industries going through the process of de-integration. The global textile industry presents one such example. Decreasing tariffs and quotas, and the consequent growth in international trade, is creating efficient markets in different parts of the supply chain and the emergence of specialized intermediaries.

The theoretical framework itself needs to be further refined. Particularly the notion of proprietary knowledge needs to be tied in to the large set of literature that is developing in the area of knowledge management across firm boundaries.

REFERENCES

Chang, S. J. & Choi, U. (1988) "Strategy, Structure and Performance of Korean Business Groups: A Transactions Cost Approach". *Journal of Industrial Economics*. 37(2): 141-158.

Chaudhuri, K.N. (1981) The British East India Company in the 17th and 18th Centuries: A Pre-modern Multinational Organization, Blusse, L, Gaastra, F, *Companies and Trade*, The Hague.

Christopher, M. (1998) *Logistics and Supply Chain Management: Strategies for Reducing Cost and Improving Service, 2nd ed*., Financial Times/Pitman.

Collis, D. V. (1992) *Birds Eye and the U.K. Frozen Food Industry (A*): Case, HBS No. 9-792-074.

D'Aveni, R. A., Richard, A. & Ravenscraft, D. J. (1994) "Economies of Integration Versus Bureaucracy Costs: Does Vertical Integration Improve Performance". *Proceedings of Academy of Management Journal*, 37(5): 1167.

Ellis, E. (2002) "Tata Steels itself for Change". *Fortune*: 45-50.

Ettlie, J.E. & Sethuraman, K. (2002) "Locus of Supply and Global Manufacturing", *International Journal of Operations & Production Management*, 22(3): 349-370.

Ghani, J.A. & Rana, A.I. (2004) "Dynamics of Outsourcing in Industrial Clusters: A Study of the Gujrat Fan Industry in Pakistan", *Asian Journal of Management Cases*, 1(1): 7-24.

Government of Pakistan (1988), *Census of Establishments Pakistan Federal Bureau of Statistics*, Islamabad.

Harrigan, K. (1985) "Vertical Integration and Corporate Strategy". *Academy of Management Journa*l. 28 (2): 397-425.

Hennart, J.-F. (1993) "Explaining the Swollen Middle: Why most Transactions are a Mix of 'Market' and 'Hierarchy'", *Organization Science*, 4(4): 529-547.

Hobbs, J. (1996) A Transaction Cost Approach to Supply Chain Management, *Supply Chain Management*, 1(2): 15-27.

Holmstrom, B. & Roberts, J., Fall (1998) "The Boundaries of the Firm Revisited", *Journal of Economic Perspectives*, 12(4): 73-94.

Khanna, T. & Palepu, K. (1999) "The Right Way to Restructure Conglomerates in Emerging Markets". *Harvard Business Review*, 77(4): 125-134.

Lall, S. (1980) "Vertical Inter-firm Linkages in LDCs: An Empirical Study", *Oxford Bulletin of Economics and Statistics*, 43(3): 203-226.

Langlois, R.N. & Robertson, P.L. (1989). "Explaining Vertical Integration: Lessons from the American Automobile Industry", *The Journal of Economic History*, 49(2): 361-375.

Little, I. M.D., Mazumdar, D. & Page Jr., J. M. (1987). *Small Manufacturing Enterprises: A Comparative Analysis of India and Other Economies*, A World Bank Research Publication, Oxford University Press.

Madhok, A., Tallman, S. (1998). "Resources, Transactions, and Rents: Managing Value Through Interfirm Collaborative Relationships", *Organizational Science*, 9: 326-339.

Mahoney, J. T. (1992). "The Choice of Organizational Form: Vertical Financial Ownership Versus Other Methods of Vertical Integration", *Strategic Management Journal*, 13: 559-584.

Moran, P. & Ghoshal, S. (1999). "Markets, Firms, and the Process of Economic Development", *Academy of Management Review*, 24(3): 390-412.

Porter, M. E. (1985). *Competitive Advantage*, The Free Press, New York: 242-245.

Rabellotti, R. (1993). "Industrial Districts in Mexico-the case of the footwear industry", *Small Enterprise Development*, 4(3): 26-36.

Schoonhoven, C. B. (2002). "Evolution of the Special Issue on Knowledge, Knowing, and Organizations". *Organization Science,* 13(3): 223.

Stigler, G. J. (1951). "The Division of Labour is limited by the Extent of the Market". *Journal of Political Economy*, 59(3): 185-193.

Temin, P. (1988). "Product Quality and Vertical Integration in the Early Cotton Textile Industry", *The Journal of Economic History*, 48(4): 891-907.

Tucker B. (1984). *Samuel Slater and the Origins of the American Textile Industry, 1790-1860*, Cornell University Press, Ithaca, NY: 53.

Venkatesan, R. (1992). "Strategic Sourcing: To Make or Not to Make", *Harvard Business Review*, 70(6): 98-107

Williamson, O. E., (1975). *Markets and Hierarchies*, New York: Free Press.

Winger, A. R. (1994). "Is Big Really bad?", *Business Economics*, 29(3): 38-42.

Womack, J. P., D. T. Jones & D. Roos. (1990). *The Machine that Changed the World.* New York: Rawson Associates.

ASSESSING THE EXTENT OF COMPLIANCE WITH INTERNATIONAL ACCOUNTING STANDARDS

Michael D. Chatham, Radford University

ABSTRACT

The purpose of this study is to assess the extent to which firms in France, Sweden, and Switzerland complied with what were then known as International Accounting Standards (now known as International Financial Reporting Standards or IFRS) in the time period immediately following the International Accounting Standards Committee's Comparability/Improvements project. There have been documented instances in which researchers have noted firms' failure to fully comply with IAS prescriptions. However, most of these studies used anecdotal observations to make readers aware that "compliance" in this context is a relative and unstable term. The type of compliance measure formed in this study can be used as a proxy for a variety of constructs in other studies, including a firm's financial reporting transparency. Compliance as measured in this case speaks volumes about the degree to which management keeps up with IAS requirements, while also providing some insight into whether management is truly interested in financial reporting transparency. By looking at factors associated with greater or lesser compliance, including the extent to which a firm's auditor confirms or denies management claims about compliance, this paper also provides some insight into what may be motivating firms to comply (or fail to comply) with international accounting prescriptions.

INTRODUCTION

The major objective of this study is to assess the extent of compliance with IAS by companies domiciled in three European countries. Specifically, this study's sample includes firms from France, Sweden, and Switzerland that have moved away from domestic financial accounting standards toward some level of compliance with International Accounting Standards[1] (IAS). This sample firms' financial statements are examined to ascertain the extent of compliance with IAS. Compliance as measured in this case speaks volumes about the degree to which management keeps up with IAS requirements, while providing some insight into whether management is truly interested in financial reporting transparency.

For firms in many countries, the adoption of IAS represents a significant change in the orientation of their financial reporting system. Whereas IAS exemplify standards that focus on the decision-making needs of capital market participants—particularly investors and creditors—the domestic generally accepted accounting principles (GAAP) of the companies switching to IAS are

often heavily influenced by tax legislation and/or governmental macroeconomic policy considerations. Consequently, the change to IAS ordinarily results in financial reports that contain greater transparency relative to domestic GAAP reports. Financial reports prepared under IAS are more suited to the needs of capital market participants because these numbers and notes are generated using a set of accounting method choices that are more restrictive than are those under domestic GAAP (Ashbaugh and Pincus 2001). Additionally, IASB's conceptual framework is patterned after the written frameworks in Australia, Canada, and the United States—all which refer to investors and creditors (rather than tax authorities or governmental agencies) as primary users of financial statements (Cairns, 2001).

There are several motives for studying companies domiciled in France, Sweden, and Switzerland. First, many companies from these countries were claiming to have adopted IAS by the late 1990s. On November 1, 1998, the IASC listed 460 total firms as complying with IAS and over one-fourth of this total (128 firms) were domiciled in these three countries. Second, because the move from the domestic GAAP of these three countries to International Accounting Standards represents more than just a trivial change in reporting systems, the variability in compliance results may make for more interesting follow-up studies. As a contrast, Canadian GAAP and IAS are so closely aligned that finding significant noncompliance on the part of Canadian firms switching from domestic GAAP to IAS is less likely. Finally, capital market information necessary to test hypotheses in follow-up studies regarding, for example, cost of capital effects of greater transparency (e.g., Botosan, 1997), is more prevalent than it would be from a number of other countries where IAS adoption is more recent (e.g., Kuwait, Slovenia, Malta, Croatia).

Financial statements prepared according to IAS are intended to provide transparent, comparable information to capital market participants and other external users making a variety of economic decisions, whereas the financial reporting of countries such as France, Sweden, and Switzerland has historically either paralleled tax accounting and/or has been designed to demonstrate conformance with a national economic plan (Gernon and Meek, 2001). Dumontier and Raffournier (1998) report that, for example, Swiss accounting is characterized by "low disclosure requirements, few and permissive accounting standards, and a high degree of tolerance for income smoothing" (p. 217). Ashbaugh and Pincus (2001) also provide empirical confirmation that the French, Swedish, and Swiss accounting measurement and disclosure requirements differ substantially from IAS during the period of this study.

The remainder of the study is organized into the following sections: Section II describes the background need for a study of this nature. Section III reviews the literature specifically related to compliance with IAS, while Section IV details the methodology for arriving at the compliance scores. Section V reports the results, summarizes the key findings and discusses the limitations and conclusions of the study. Finally, recommendations for future research are proposed.

BACKGROUND

Companies have frequently noted in annual reports that they are in full compliance with IAS, despite obvious exceptions to IAS guidelines. The IASB has tried to mitigate this possibility by requiring companies to report any material departure from IAS and to not report that they are in compliance with IAS unless they in fact do fully comply (IAS #1). However, most of the claimed adoptions noted in this and other studies occurred prior to this new IAS requirement becoming effective (for financial statements covering a period beginning on or after July 1, 1998), and auditors have not been helpful in the quest to discern whether a company is complying fully with IAS both before and after the implementation date of IAS #1 (Street and Gray, 2000a). In short, there is consensus that it is problematic to determine whether there has been an actual adoption of IAS and when it has occurred.

International Accounting Standards have been a popular global accounting standard choice for some time. Upon completion of the Comparability Project in 1998, the IASC website reported that 831 companies worldwide were referring to their use of IAS when preparing annual financial reports. However, the IASC did not distinguish among the companies that only *mentioned* IAS in their reports, the companies that reported full compliance with IAS standards when in fact there are material deviations from IAS, and the companies that were actually in full compliance with the latest IAS guidelines.

There was a time when most academics in the international accounting community assumed that compliance with IAS was basically a dichotomous variable—meaning that a firm in question was either fully complying with IAS or it was using some other GAAP. Companies alleging to be in full compliance were taken at face value. Moreover, it was often large, well-known auditing firms providing credibility to these companies by signing off on the usage of IAS in their annual reports. However, Street and Gray (2000a, b), Street, Gray and Bryant (1999) and Cairns (1999a), have all presented examples of significant non-compliance among companies purporting to use IAS.

The IASC must have recognized that there was a problem with noncompliance as early as 1998. As mentioned previously, revised IAS #1, entitled “Presentation of Financial Statements,” became effective in July of 1998 and requires that, "An enterprise whose financial statements comply with International Accounting Standards should disclose that fact. Financial statements should not be described as complying with International Accounting Standards unless they comply with all the requirements of each applicable Standard and each applicable Interpretation of the Standing Interpretations Committee” (Street and Gray, 2000b).

Nevertheless, Street and Gray (2000a) found that at least one firm (Valeo, France) mentions the use of IAS, but acknowledges violating IAS #1 because not all IASC standards are “applied in their entirety” (Valeo 1999 Annual Report). In short, it appears Valeo is admitting to exceptions to IAS despite IAS #1 specifically requiring that only fully complying firms mention their use of IAS.

It is also disturbing that Valeo's auditor, PriceWaterhouseCoopers, does not provide these exceptions in the audit report.

Indications that IAS compliance is truly not a dichotomous variable suggest that any examination of IAS usage should involve the *degree* of IAS compliance—possibly over several years. Additionally, the study of the degree of compliance is less ambiguous if it is carried out during a period when the underlying accounting standards are kept relatively constant and prior to the adoption of IAS/IFRS becoming mandatory for European Union firms.[2] With this in mind, this study looks at French, Swedish, and Swiss financial statements for the years 1996-1998. Many firms began jumping on the "IAS bandwagon" in the mid-1990s, providing a nice size sample of firms to investigate. The period prior to 1996 was one of transition for the IASC/IASB and its standards.[3] In 1993, for instance, ten revised IASs with 1995 implementation dates were issued (IASB website) whereas the 1996-1998 period saw comparatively few new standards implemented. Consequently, this three-year term provides a relatively stable set of standards from which to form a compliance instrument. The results of this analysis will also provide insight into how quickly (if at all) firms began complying with accounting standards that were, for the most part, recently promulgated.

Evaluating 'Adoption' of International Accounting Standards

A number of published papers used a dichotomous assessment of compliance with IAS (Ashbaugh and Pincus, 2001; Murphy, 2000; Taylor and Jones, 1999; El-Gazzar, Finn and Jacob, 1999; Dumontier and Raffournier, 1998). Companies were deemed to be either fully compliant adopters or non-IAS users. These papers often employed an event-study methodology and either claims made in annual reports or an IASB (IASC at the time) website list to confirm that a company had in fact adopted IAS. In short, these authors relied on the assertions of biased parties to assess the period during which IAS may have first been used.[4]

In one of the early attempts to get at de facto compliance with IAS, Tower et al. (1999), using firms from six countries in the Asia-Pacific region, provide evidence as to the degree of compliance with IAS. They find that among a number of variables studied, the home country of the reporting company most heavily influences the degree of compliance. These authors also find that other variables such as firm size, leverage, profit level, and industry have very little if any explanatory power. Others who have examined IAS compliance include Cairns (1999a, 1999b, 1999c), Street et al. (1999), Street and Gray (2000a, 2000b), and Taplin et al. (2002). A secondary purpose of this study is to expand on existing IAS compliance research by focusing on compliance exclusively in three countries that historically do not have reputations for catering to the needs of capital market providers.

Limiting Scope

Despite attempts made in this study to mitigate the possibility, there remains the concern that the IASB has no enforcement mechanism to insure that companies abide by its standards and that appearances with respect to compliance may be deceiving. Specifically, the nondisclosure of certain items (e.g., geographic segment numbers) could be indicative of either noncompliance or lack of applicability (Tower et al., 1999). While noting that firms may intentionally violate IAS and go unpunished, the methodology applied in this study—most notably the use of a thorough examination of the annual report and claims made by the auditor—alleviates some of this nondisclosure concern.

PRIOR RESEARCH

The studies involving IAS usage or compliance as means of providing greater information are in short supply. When IAS compliance is addressed in prior literature, it is occasionally the primary variable of interest, and it is sometimes just part of a broader research question. Regardless of the role played by IAS compliance in these studies, it is has been evaluated both as a dichotomous variable (full compliance with IAS or not) and as a continuous variable (extent of compliance is assessed). The discussion below describes: 1) the literature pertaining to IASC's standards and the firms that adopt them, particularly as it relates to the countries in this study; 2) the literature using a dichotomous measure to evaluate compliance with IAS; 3) the first indications of noncompliance; 4) how researchers have dealt with measuring compliance given the extent of noncompliance; and 5) the limitations of using IAS compliance as a variable in an empirical study of this nature.

The IASC and IAS Adopters

A large number of IAS adopters are from Europe, but Canada and the Middle East are also well represented. Cairns (1999a) reports that the accounting requirements in continental Europe have historically been perceived as being different from and more flexible than IASs. However, he also notes that it has often been possible for continental European companies to choose options within their domestic accounting standards and IAS such that the firm complies with both domestic GAAP and IASs. Cairns states that the French and Nordic companies have been practicing this approach for "many years" (p. 8) and that Swiss companies have been doing so since the late 1980s. The reduction in the flexibility (due in part to the IASC's Comparability/Improvements project) once available with IAS has served to make this "dual compliance" more difficult to achieve. At the same time, the national standard setting bodies in France, Sweden and Switzerland (among others) are making it easier to comply with both sets of standards by increasing the conformance of their national accounting requirements with IASs (Cairns, 1999a). Cairns also points out that some companies (e.g., Swedish firms) had dropped their reference to the use of IAS after their countries

joined the European Union (EU). Since EU member stock exchanges allowed the use of domestic GAAP financial statements to gain access, some of the motivation for claiming to comply with IAS no longer existed.[5]

IAS Compliance as Dichotomous Measure

A handful of studies incorporate analyses of compliance with IAS as part of a broader question. The use of "IAS compliance" as a variable in studies has evolved considerably in the last four or five years. As recently as six years ago, researchers assumed that a firm's attestations regarding its use of IAS in the financial statements were sufficient to presume that the firm was fully complying with IASC standards. Hence, the assessment of IAS compliance in these earlier studies became a dichotomous measure. Some of these authors warn of the tenuous nature of the firms' "degrees" of compliance, while others do not. These examinations often apply an event-study methodology to assess the effects of, or reasons for, initially adopting IAS.

Dumontier and Raffournier (1998), for instance, find that among Swiss companies certain firm characteristics make it more likely that the firm is reporting under IAS. Specifically, the authors find that, among other things, firm size increases the likelihood that a Swiss company is using IAS. The authors place a Swiss firm in the "IAS group" if it has declared that its financial statements conform to IAS. Those companies referring to IAS, yet admitting that there are exceptions to the IAS disclosure requirements, are classified as being in the IAS group. Dumontier and Raffournier justify the placement of these non-conforming firms into the IAS group by stating that, "[these] companies which referred to IAS but with some disclosure exceptions were nevertheless classified in the IAS group because it was apparent that most Swiss firms which declare compliance with IAS do not, in fact, satisfy the entire set of disclosure requirements of the IASC" (p. 227).

Ashbaugh and Pincus (2001) also assess IAS compliance with a dichotomous measure. Using non-U.S. firms that "adopted" IAS during the 1990-93 period, Ashbaugh and Pincus investigate the impact of countries' accounting measurement and disclosure standards (relative to IAS) on the ability of analysts to accurately forecast earnings, including whether the adoption of IAS improves this ability. The authors posit that the analyst's task is easier if a country's accounting standards are more like IAS or if a firm adopts IAS. Ashbaugh and Pincus compare domestic measurement and disclosure practices to IAS using a self-constructed index that numerically depicts the differences between thirteen countries' domestic GAAPs and IAS. The authors determine that the French, Swedish, and Swiss domestic requirements differ substantially from IAS.[6] Ashbaugh and Pincus (2001) ultimately conclude that the adoption of IAS improves the analyst's ability to forecast earnings, as it secures a reduction in the absolute value of analysts' earnings forecast errors. However, the evaluation of the IAS adoption "event" in Ashbaugh and Pincus (2001) is based simply on lists of adopters obtained from the IASC's website in 1993. Although the authors

examine many of their sample firms' annual reports to confirm the year of adoption, the research cited in the following section demonstrates that neither the IASC list nor companies' annual report claims should be used as confirmation of firms' compliance with IAS.

Indications of Noncompliance

Street and Gray (2000a, b), Street and Bryant (2000), Tower et al. (1999), Street et al. (1999), and Cairns (1999a) provide the initial examples of significant non-compliance among companies purporting to use IAS. Street et al. (1999) look specifically at compliance with the ten IASs issued as part of the IASC's Comparability Project. The authors inspect the 1996 annual reports of 49 large companies that claim to comply (or admit only limited exceptions) with IAS in their accounting policy notes. They find that noncompliance is particularly common when the sample companies present: extraordinary items; the revaluation of property, plant, and equipment; pension disclosures; the valuation of inventories; the restatement of foreign entities for companies operating in hyperinflationary economies; and, the amortization (or lack thereof) of goodwill. Street et al.'s (1999) evaluation of compliance improves upon simply using a company's claims. Street et al. use a survey instrument that was based on the text in the ten revised IASs. This instrument allows the researchers to compare the required IAS measurement and disclosure practices to those used by the sample firms.[7]

Street and Gray (2000b) use the financial statements of 279 companies appearing on the 1999 IASC list of "Companies Referring to their Use of IAS" and find that there is significant noncompliance with IAS requirements. Street and Gray find that, among other things, compliance tends to be greatest for companies domiciled in China and to be most problematic for companies domiciled in France.

The indications of significant noncompliance have particularly troubled Cairns (1999a) and Glaum and Street (2003). In fact, Cairns has suggested regulatory authorities should take disciplinary action against those audit firms that ignore obvious noncompliance with IAS—and especially when these firms issue an unqualified opinion or reference IAS in a misleading manner. He also asks the IASB to reconsider its policy of requiring no mention of IAS unless in conjunction with full compliance. Cairns indicates that it would be better to know that a company has complied with, for instance, all IAS but one or two, rather than to not know anything about how the financial statements might compare to ones prepared under IAS.

Measuring the Degree of Compliance with IAS

It may have been some of these early findings of noncompliance that motivated researchers to move away from assuming compliance when a firm simply stated that its financial statements were in conformance with IAS (i.e., the dichotomous approach). Researchers have recently begun

incorporating more sophisticated methods for measuring the degree of IAS compliance (see Cairns, 1999d; Tower et al. 1999; Daske and Gebhardt, 2006).

In several articles (e.g., Cairns, 1999d), Cairns refers to three general categories of companies' financial statement presentations that claim compliance with IAS even though they do not fully comply. First, there are those companies that disclose compliance with IAS but with certain specified exceptions in the accounting policy statement. The second category also encompasses companies who claim to comply with exceptions, but the exceptions are disclosed somewhere deep within the notes to the financial statements rather than in the accounting policy statement. The third category is the most worrisome to Cairns and others relying on financial statements purportedly compiled under IAS requirements. It comprises companies that claim compliance with IAS without exceptions, but where even a cursory examination of the financial statements reveals substantive non-compliance issues. These three categories may serve as a useful starting point for all but the most rigorous examinations of the effects of IAS noncompliance.

Cairns (1999a)[8] offers evidence that many companies were using what he deemed was "IAS Lite" (i.e., less that full compliance), and he provides a more detailed measurement scale for assessing the degree of compliance with IAS. Cairns places firms mentioning IAS in their 1998 financial statements into eleven categories (see Appendix 4). Cairns finds that there is significant noncompliance among his sample firms. He categorizes 71 of the 125 sample companies in something other than category #1 (full compliance). Cairns also documents a number of the ways in which firms do not comply with the current IAS requirements (p.203):

1) the non-disclosure of cost of goods sold and other income statement expenses;
2) the inclusion of extraordinary items in the income statement which do not meet the criteria to be included as such;
3) the amortization of goodwill as a reduction of gross profit, rather than as an expense to determine gross profit;
4) the amortization of goodwill over more than 20 years;
5) writing off goodwill directly to equity (disallowed for post-1994 goodwill);
6) the inclusion or deduction of too many items from cash and cash equivalents on the Statement of Cash Flows (e.g., including equity investments and deducting bank loans);
7) the use of LIFO for inventories in one location, while a different cost-flow method is used for apparently similar inventories in another location;
8) the omission of required disclosures for segments, particularly the segment result (profit or loss);
9) the use of very broad industry and geographic segment delineations.

As previously indicated, Cairns also finds that some auditors are either claiming the company to be in compliance with IAS when there are obvious deviations from full compliance, or the auditors avoid expressing an opinion on the compliance with IAS even when IAS usage (often with exceptions noted) is mentioned within the financial statements.

Tower et al. (1999) endeavor to provide an even more precise measure of IAS compliance by examining it as a continuous variable. The authors use firms from six countries in the Asia-Pacific region to offer evidence on the degree of compliance with IAS, as measured by a percentage of compliance. Tower et al. code each of 512 "compliance points" within a total of twenty-six IASs (applicable to 1997 fiscal year-ends) according to the following options:

1) No compliance with the relevant IAS issue;
2) Compliance with the relevant IAS issue;
3) Compliance with IAS benchmark on a particular issue;
4) Compliance with IAS allowable alternative on a particular issue;
5) Compliance with both the IAS benchmark and allowable alternative;
6) Compliance not disclosed and not readily discernable; and
7) Non-applicable issue.

The authors report two problems with this type of coding. First, a number of items are clearly not applicable to some reporting firms (e.g., IAS 11 on Construction Contracts), and 2) there is considerable non-disclosure with regard to many of the IAS rules. Tower et al. address the latter concern by measuring IAS compliance in two ways: 1) with non-disclosure indicating "non-applicability" of that particular accounting issue and 2) with non-disclosure indicating "non-compliance" with IAS guidelines. The authors find that there is a considerable disparity between the results from each of the two measures of IAS compliance.[9]

Tower et al. (1999) also examine the determinants of IAS compliance by regressing the level of compliance on a number of firm characteristics. They find that among the variables studied, the home country of the reporting company is the characteristic that most heavily influences the degree of compliance. Tower et al. also discover that a troubling amount of non-compliance exists if non-disclosure of an item is in effect assumed to be non-compliance. Given that this lack of disclosure could be indicative of either non-compliance or the non-applicability of that particular standard, an assessment of this type can be extremely subjective (e.g., deciding whether a firm with primarily local operations has provided sufficient geographic segment results).

Audit Report as Confirmation or Dissent

A financial statement user's expectation regarding the extent of compliance with IAS is likely affected by the nature of the audit opinion provided. The assertions made by the company in the financial statements can essentially be further confirmed or somewhat disavowed by its auditor in the audit report. Cairns (1999a) discusses the extent to which auditors have provided confirmation of firms' use of IAS. He formulates seven approaches that an auditor may use to express their opinion as to the firm's degree of compliance with IAS:

1) True and fair view in accordance with IASs
2) True and fair view and comply with IASs
3) True and fair view – no accounting framework
4) Presented fairly in accordance with IASs
5) Presented fairly *and* comply with IASs
6) Presented fairly – no accounting framework
7) Comply with IASs – no reference to true and fair view or presented fairly

(Cairns 1999a, p. 188).

Cairns considers the firm's contentions about IAS usage as an issue that is separate from the auditor's opinion. In other words, he does not integrate the assessment of the firm's IAS compliance with the auditor's contentions. However, in an empirical assessment of the effects of IAS compliance, it would seem logical to take the auditor's statement into consideration as playing either a confirmatory or a contradictory role. Consequently, this study will analyze not just a firm's presentation, but also its auditor's statements in order to assess the relative effects of compliance. The review of the extent to which the auditor corroborates the statements made by the firm is somewhat different from Cairn's categories above, yet is inspired by Cairn's approach.

In summary, the prominent deficiency with most of the previous literature involving IAS compliance is that researchers deal with IAS compliance as if it were a dichotomous variable. The conclusions reached in these studies are placed in doubt given the evidence on noncompliance in Cairns (1999a), Tower et al. (1999), Street and Bryant (2000), and others. While these subsequent authors expose the degree of noncompliance, and even provide various means to assess degrees of compliance, they do not attempt to provide an in-depth assessment of the economic impact of either complying or not complying with IAS, something the measure provided in this study would allow them to do.

Finally, the instruments used to address IAS compliance in Street et al. (1999), Tower et al. (1999), Taplin et al. (2002), and the one detailed in a subsequent section of this study at least partially ignore what may be valuable evidence for users as they assess the credibility of firms' financial presentations. A number of authors contend that the degree of enforcement of accounting standards may be as important as the standards themselves (e.g., Hope, 2003; O'Brien, 1998; and Sunder, 1997). The instrument used in this study and some of the authors previously mentioned, however, do provide some anecdotal evidence on accounting enforcement.[10] For instance, the lack of enforcement is apparent when a sample firm's auditor opines that the firm complies fully with IAS, yet the firm's financial statements indicate that deviations from full compliance are present.

METHODOLOGY

The three-year period from 1996 to 1998 is used to evaluate the effect of IAS compliance on the information asymmetry proxies. 1996 is chosen as a start date in part because the IASC's Comparability/Improvements Project was ending. One of the objectives of the Comparability Project

was to reduce the number of allowed alternatives under IAS. Since fewer accounting choices were now available, it is likely easier to distinguish between the use of IAS and domestic GAAP, hence the extent of IAS compliance. The 1996-1998 period also partially coincides with two well-known compliance studies discussed earlier (Street et al. [1999], who analyze 1996 fiscal period reports and Cairns [1999a], who reviews fiscal 1998 reports).

At November 1998, the IASC's webpage listed 128 firms from France, Sweden, and Switzerland using IAS. Nineteen of these firms are omitted from the study because the firm was either not publicly listed, it substantially changed structure via merger or acquisition, or it was an affiliated firm or subsidiary of another sample firm. Fifteen firms are omitted because they did not have at least two English annual reports available during the three fiscal years 1996-1998. Ten of the firms are removed because there were no claims in either the accounting policy statement or the audit report that IAS was being used. Two firms are omitted because of claims that U.S. GAAP was being used in conjunction with IAS. Finally, nine firms were added when evidence of their IAS compliance claims became apparent through a variety of other sources (e.g., Global Vantage, Auer [1998], Dumontier and Raffournier [1998]). The resulting sample consists of 91 firms and 247 firm-year observations of IAS compliance, though some observations are omitted in the following analyses due to missing observations in related variables of interest.

128	French, Swedish, Swiss firms listed on IASC website
(19)	Non-listed, structure change, affiliated firms
(15)	Firms without at least two years of English annual reports
(10)	Firms not claiming compliance in either audit report or policy statement
(2)	Firms using U.S. GAAP in addition to IAS
9	IAS "Claimants" not listed on IASC website
= 91	Study firms scored for IAS compliance
x 2.72	Average number of reports per firm
= 247	Total annual reports evaluated for IAS compliance[11]

The instrument appearing in Appendix 1 is used to assess the extent of a firm's compliance with IAS. It is in part the result of information from Cairns (1999a), Tower et al. (1999), and others (e.g., Ashbaugh and Pincus, 1998; Street and Gray, 2000a) who have analyzed firms' compliance with International Accounting Standards. Cairns's categorical assessment and Tower et al.'s 512-point evaluation are likely the two most comprehensive instruments that have been used to assess IAS compliance.

There are several difficulties with using Cairns's categorical (discussed earlier) approach in an empirical analyses. First, the guidelines for placing a firm into a particular category seem less precise and more subjective than what is normally required for a rigorous empirical piece. Cairns is not abundantly clear about what evidence is needed to place a firm into a particular category. He admits that some firms are very close to being reclassified into another category, hinting that the categorization may require considerable judgment. Second, the categories are not rank-ordered from

most compliant to least compliant, and Cairns does not always provide an indication as to what categorical placement is preferred over another. Even if a researcher could use these categories to form a reliable rank-ordering, the coefficients on the resulting class variables would be less meaningful than they would be if the classes had more clearly defined ordinal properties.

An instrument similar to the one in Tower et al. (1999) appears to be preferable to Cairns's in that it measures compliance with more precision. These authors use seven "levels" of compliance within each of 512 specific IAS requirements. The placement of a firm into one of these seven categories is less subjective than the Cairns (1999a) approach, but analyzing 512 items is a time-consuming process. These authors found that over 60 percent of the data points addressed in their instrument were scored as "not disclosed", suggesting that their instrument may actually be too detailed. The authors found it difficult to ascertain whether a firm did not provide a required disclosures due to noncompliance or because the requirement was not applicable to that firm (e.g., no discontinued operations presented because the firm did not have operations meeting the criteria). The Tower et al. instrument is primarily a structured search for IAS-required disclosures, whereas the Cairns (1999a) manuscript deals more with the misclassification of events or the misrepresentation of some aspect of performance.

The instrument described in Appendix 1 removes some of the subjectivity found in Cairns's (1999a) method and it can be applied more efficiently than the Tower et al. (1999) instrument. The 46 questions were developed by considering all the prior research on IAS compliance. This research, including Cairns (1999a), Tower et al. (1999), Ashbaugh and Pincus (1998), and Street and Gray (2000a), helped to identify not just contentious issues, but also those IAS requirements that were most often being ignored by firms. The choice of the questions is also based upon using the contentious issues that can be evaluated with the most objectivity. Industry specific standards and/or guidelines that apply to only a small subset of firms, such as IAS #11 (Construction), IAS #15 (Changing Prices), IAS #20 (Government Grants), IAS #26 (Accounting and Reporting by Retirement Benefit Plans), IAS #29 (Hyperinflationary Economies), IAS #30 (Banks & Financial Institution disclosures), etc., are omitted from the analysis.

The instrument in Appendix 1 is applied to a total of 247 annual reports (from 91 firms). A score of '3' is given to a firm on each of 46 questions if it was in full compliance with IAS. A score of '2' is given when it was not readily apparent that a firm was complying or it was not clear that the question/standard applied to it. A score of '1' was given when the firm was obviously not complying with a particular standard.

All of the questions found in the instrument pertain to IAS requirements during the period of study except for questions #42 and #43. These questions deal with the requirement to present basic and fully diluted earnings per share, including the weighted average shares outstanding used for calculation. Since this requirement (IAS #33) is effective only for fiscal periods beginning on or after January 1, 1998, the denominator representing the total possible compliance score is greater (by six) for those firms' reports that cover a period starting after IAS #33 becomes effective.

Some of the evaluations are subjective. For instance, the requirement to present minority interest is unimportant if the firm fully owns all of its subsidiaries (or it uses the rarely applied pooling of interest approach). However, if the presentation does not make it clear that there is 100% ownership, the failure to provide minority interest figures results in a '2', or possibly even a '3' if there are indications elsewhere of interests representing between 50% and 100% ownership of a firm (thus creating minority interest). As another example, question #41 addresses whether a firm presents financial asset and liability information so that the amount, timing, and likelihood of future cash flows can be assessed. This question has several layers of subjectivity. First, does the firm have sufficient financial assets and liabilities to cause concern about the ability or inability of these assets and liabilities to create or use cash? Second, if the firm does have a material amount of these assets or liabilities, is the disclosure adequate? Basically, if there are any questions as to the adequacy of disclosure, the firm receives a '2' on this issue—and other issues of this type.

The question that possibly requires the most judgment is question #19, "Does the entity adequately break down its operations into segments necessary to evaluate do product line and geographic analysis?" This scoring is based on comparing the segment disclosure to other parts of the annual report. For instance, if a firm describes various geographic locations in which it is operating or it has managers whose titles suggest their responsibilities cover a particular region or product line, then the expectation is that segment results are presented the same way. If discussion in the annual report suggests there are at least four or five geographic areas and/or four or five distinct product lines, but the firm only provides results on two areas or product lines, then the firm receives a score of at most a '2' on that particular question.

Questions #23 and #24 relate to the classification and presentation of leases. If a firm states that it has no leased assets, then it receives a score of '3'. If it is unclear whether the firm had leased assets (e.g., there is no statement to the effect that it does not have leased assets, or there are hints elsewhere in the annual report that there are lease obligations), failure to provide the information required in questions #23 and #24 results in a score of '1'. Two questions are conditional on the "answer" to the previous question (e.g., #36 is dependent on #35), but for the most part the questions address unique issues and are independent of answers to other questions.

Some judgment is also involved when evaluating the "spirit" of the IAS requirements. For instance, the requirements to expense R&D and to capitalize some development costs imply that the amounts that are expensed are distinguishable from other operating expenses. If a firm proclaims that it is expensing R&D, but the expense is "hidden" within depreciation, salaries, etc., the result is a score of '2'.

The IASC does not intend to have all required items within the "audited" section of the financial statements. For instance, the "discussion of the segments requirement" (Questions #20 and #21) would be met by very few firms if it is required to be within the "audited" pages. However, the focus of the compliance questions is on the "audited pages" of a firm's financial report. Though it is sometimes unclear where these audited pages start and stop, the IASC specifically excludes

management's discussion of specific operations from its definition of "financial statements." Hence, an adjustment is made to a firm's compliance score if certain presentations are made only in the management discussion area of the report. Specifically, if one of the required quantitative segment disclosures (questions #15, #16, #17) is provided outside the context of the audited pages of the annual report, a .5 penalty is assessed on that particular item, after a determination of the adequacy of the disclosure is made. The exception to this scoring is the requirement to describe the geographic and product line segments (questions #20 and #21). There is no penalty assessed if this discussion is presented outside the audited pages. The compliance scores are also completed with an eye on materiality. If it is unclear in which compliance category an item should be placed, the materiality of that item relative to amounts within the same statement becomes important. For instance, if goodwill amortization is presented as a percentage of total operating expenses in the notes rather than the face of the statement, but it represents only .2% of the total expenses, the firm is deemed to be in full compliance with the requirement to amortize goodwill (question #11).

Two percentage compliance scores are calculated. One score equally weights each of the 46 questions in Appendix 1. The second compliance score weights each question based on its perceived important to a financial statement user. Two accounting academics well-versed in financial statement analysis and one finance academic who is also a practicing financial analyst were asked to categorize the questions as A) most important, B) moderately important, or C) least important from the perspective of a financial statement user attempting to assess firm value.[12] The consensus weighting is reflected in Appendix 1 by denoting the "most important" questions with an 'A', moderately important questions with a 'B', and least important questions with a 'C'. The weights were applied by multiplying the 'A' category question scores by 2, the 'B' scores by 1.5, and the 'C' scores by 1.0. For both the raw and weighted measures, the sum of the individual question scores is divided by the total possible score to achieve a percentage compliance score.

Audit Opinion as Moderating Effect

The type of audit opinion provided can impact a user's confidence in a set of financial statements. Users who see an audit report as contradicting management claims likely view the financial statements in an entirely different light—likely with less credibility—than they would if management and auditor assertions are in agreement. In the context of this study, an auditor may attest to a client's compliance with IAS or may indicate something quite different. These auditor assertions serve to either corroborate or refute what management has declared within the accounting policy section of the annual report.

As a result, the scoring approach described in Appendix 2 is used to classify auditors' opinions as either 1) confirming management's contention that the firm is complying with IAS, or 2) non-confirming.[13] The first category of firms is those in which both the accounting policy statement and the audit report confirm IAS compliance (referring to Appendix 2, a score of '1' or

'3' in both the accounting policy and audit report evaluations) with no exceptions noted (a score of 'A' in assessment B2). The second category of firms includes all those not satisfying the criteria for the first category. There are no instances of an auditor asserting IAS compliance without management making similar claims.

A "dummy" variable is created in which the firms in the first group (called "auditor-confirming" firms) are assigned a value of '1' and all other firms are assigned a value of '0'. The resulting dichotomous variable can then be used to test whether the auditor's confirmation (or lack thereof) of IAS use has any impact on the relationship between IAS compliance and any of an assortment of other variables. In this study, a comparison of the extent of compliance between "auditor-confirming" firms and all others is performed to see if the auditor's claims are indicative of a firm's greater compliance with IAS.

RESULTS, CONCLUSIONS, AND RECOMMENDATIONS

Table 1 shows descriptive statistics on the characteristics of the sample firms. The primary variable of interest, IAS compliance, ranges from 70.25% to 95.31% compliance. The firms from Switzerland have the highest average percentage IAS compliance score (85.3%), while the firms from Sweden have the lowest (75.8%) average. Although these 91 sample firms each claim compliance with IAS, only 48 (52.7%) of them have auditor confirmation of compliance. Descriptive statistics on a number of other variables are also provided. Characteristics such as market capitalization, number of employees, trading volume, and earning per share variability span a wide range of values.

Table 1 – Descriptive Statistics on Firm Characteristics

	IAS Compliance	Market Capitalization	Number of Employees	Number of Analysts	Trading Volume	EPS Variability
Number of firms	91	89	87	81	89	83
Mean	83.47%	$5,276,020	17,380	15.2381	3,225,464	216.53%
Median	84.31%	$811,490	6,940	15	380,795	96.83%
Maximum	95.31%	$111,303,750	225,810	41	46,116,336	2488.32%
Minimum	70.25%	$15,770	35	3	88	4.94%
Std. Dev.	6.69%	$17,105,241	32,681	7.89	7,606,056	354.23%
	Auditor Confirmation		Firms by Country		% Compliance by Country	
	91 Firms		18 - France		France – 80.6	
	48 Confirmations		9 - Sweden		Sweden – 75.8	
	43 Non-Conformations		64 - Switzerland		Switz. – 85.3	

"Number of firms" is the number of firms having values for that variable. The number of analysts is based on per-firm averages.
Market Capitalization (in 000s of $U.S.) is 1997 Closing Stock Price times Common Shares Outstanding
Trading Volume is measured as the raw number of shares traded on an average monthly basis.
EPS Volatility is measured as the standard deviation of the percent change in EPS over 1995-1999.
Auditor Confirmation is the number of firms for which an auditor verifies the use of IAS in the audit report.

Pearson correlation coefficients are also calculated for some key univariate relationships, including variables discussed in prior literature, but primarily in the context of U.S. firms in U.S. markets. Table II below shows that a number of these variables that are highly correlated. Using .5 correlation as a subjective benchmark, while realizing that even some less significant correlations can cause multicollinearity problems in a regressing setting, these pairs of variables appearing in the same model may create imprecise coefficient estimates:

IAS (compliance) and AUDIT (r = .55861)
SIZECAP and ANALYST (r = .58596)
SIZEEMP and ANALYST (r = .61695)

Table 2 also provides some insight into the firm characteristics that are associated with higher or lower levels of IAS compliance. Consistent with Tower et al. (1999), the country designations provide information regarding variation in IAS compliance. Results on the positive relationship between firm size and disclosure (e.g., Meek et al., 1995; Raffournier, 1995; Wallace and Naser, 1995; Ashbaugh, 2001) make it no surprise that firm size (based on either market capitalization or number of employees) and IAS compliance are significantly positively correlated. Another variable that has strong ties to firm size, analyst following, is also significantly positively correlated with the extent of IAS compliance. In fact, trading volume and earnings per share variability are the only variables shown not to have a statistically significant relationship with IAS compliance. Results (not reported) with additional variables (e.g., industry type and cross-listing status) provide insignificant correlations with IAS compliance.

An investigation of the factors associated with IAS compliance suggests that compliance seems to be related to a number of firm characteristics. For this sample of firms, the country of domicile seems to be the best indicator of the extent of compliance. Specifically, firm domiciled in Switzerland comply with IAS to a greater degree than firms from France and Sweden. Not surprisingly, when an auditor confirms the use of IAS among the sample firms, it is also a strong indicator of relatively higher levels of IAS compliance. Also, larger analyst following and a relatively greater firm size, as measured by both market capitalization and number of employees, are both associated with greater levels of IAS compliance.

Table 2– Correlation Matrix (Independent Variables)
Pearson Correlation Coefficients: Prob > |r| under H0: Rho=0 Number of Observations = 213

	(X1)	(X2)	(X3)	(X4)	(X5A)	(X5B)	(X6)	(X7)	(X8)
	IAS	AUDIT	FRANCE	SWEDEN	SIZECAP	SIZEEMP	ANALYST	VOLUME	EPSVAR
(X1)	1	0.55861	-0.28469	-0.43151	0.20818	0.16338	0.17365	-0.08437	-0.054
IAS		<.0001	<.0001	<.0001	0.0023	0.017	0.0111	0.2201	0.433
	213	213	213	213	213	213	213	213	213
(X2)	0.55861	1	-0.42571	-0.35136	0.0327	0.00862	0.00841	-0.24892	-0.06378
AUDIT	<.0001		<.0001	<.0001	0.6351	0.9005	0.9029	0.0002	0.3543
	213	213	213	213	213	213	213	213	213
(X3)	-0.28469	-0.42571	1	-0.17922	0.23347	0.2704	0.20444	0.29477	-0.00814
FRANCE	<.0001	<.0001		0.0088	0.0006	<.0001	0.0027	<.0001	0.906
	213	213	213	213	213	213	213	213	213
(X4)	-0.43151	-0.35136	-0.17922	1	-0.14428	0.04886	0.05701	0.35803	-0.16006
SWEDEN	<.0001	<.0001	0.0088		0.0353	0.4781	0.4078	<.0001	0.0194
	213	213	213	213	213	213	213	213	213
(X5A)	0.20818	0.0327	0.23347	-0.14428	1	0.47998	0.58596	0.32582	-0.10722
SIZECAP	0.0023	0.6351	0.0006	0.0353		<.0001	<.0001	<.0001	0.1187
	213	213	213	213	213	213	213	213	213
(X5B)	0.16338	0.00862	0.2704	0.04886	0.47998	1	0.61695	0.44584	-0.20088
SIZEEMP	0.017	0.9005	<.0001	0.4781	<.0001		<.0001	<.0001	0.0032
	213	213	213	213	213	213	213	213	213
(X6)	0.17365	0.00841	0.20444	0.05701	0.58596	0.61695	1	0.4294	-0.18962
ANALYST	0.0111	0.9029	0.0027	0.4078	<.0001	<.0001		<.0001	0.0055
	213	213	213	213	213	213	213	213	213
(X7)	-0.08437	-0.24892	0.29477	0.35803	0.32582	0.44584	0.4294	1	-0.1528
VOLUME	0.2201	0.0002	<.0001	<.0001	<.0001	<.0001	<.0001		0.0257
	213	213	213	213	213	213	213	213	213
(X8)	-0.054	-0.06378	-0.00814	-0.16006	-0.10722	-0.20088	-0.18962	-0.1528	1
EPSVAR	0.433	0.3543	0.906	0.0194	0.1187	0.0032	0.0055	0.0257	
	213	213	213	213	213	213	213	213	213

IAS is the weighted percentage IAS compliance score during each of three (maximum) fiscal report periods. AUDIT is a binary variable representing the auditor's IAS compliance
confirmation ('1' if present). FRANCE is a binary variable ('1' if firm domiciled in France). SWEDEN is a binary variable ('1' if firm domiciled in Sweden). SIZECAP is a binary variable
('1' if market capitalization of firm is greater than the mean market capitalization of all sample firms). SIZEEMP is a binary variable ('1' if number of firm employees greater than the
mean number of employees of all sample firms). ANALYST is a binary variable ('1' if number of analysts following firm is greater than the mean number of analysts following all sample firms).
VOLUME is a binary variable ('1' if a firm's average monthly trading volume in number of common shares is greater than the median trading volume for all sample firms).
EPSVAR is a binary variable ('1' if the standard deviation of a firm's 1995-1999 annual earnings per share percentage change is greater than the mean standard deviation for all sample firms).

Future Research

There is little research to date exploring the implications of moving toward compliance with IAS. Only Leuz (2003), Ashbaugh and Pincus (2001), Ball et al. (2003), Daske (2006) and Covrig et al. (2007) have empirically examined the benefits or implications of using IAS.[14] This in spite of the fact that there has been at least one specific call for research into the benefits of adopting IAS. Mr. Gerrit H de Marez Oyens, Secretary General of the World Federation of Stock Exchanges (FIBV), encouraged research on this topic in a 1998 speech to the American Accounting Association members.[15] He challenged academics to "quantify the savings of using IAS," and to "show that IAS benefits investors by lowering costs of capital or lowering transaction fee costs." Mr. De Marez Oyens mentioned that research results of this nature would help remove much of the political haze that surrounds the debate regarding the worthiness of IAS and they may assist in convincing firms that the burden of changing reporting systems is worthwhile. An instrument of the type illustrated in this study—and the resulting percentage compliance score—would allow for such an examination.

ENDNOTES

1 These standard are promulgated by the International Accounting Standards Board (IASB hereafter), which was previously known as the International Accounting Standards Committee (IASC). The IASB now refers to its standards as IFRS (International Financial Reporting Standards).

2 As of January 14, 2003, the EU requires all firms listed on a regulated market to prepare their consolidated financial statements in accordance with International Accounting Standards, beginning with their fiscal 2005 statements. Comparative IAS/IFRS information is required for the fiscal 2004 reports prepared under standards other than IAS/IFRS (Regulation No 1606/2002 of the European Parliament and of the Council).

3 In hopes of gaining IOSCO's (International Organization of Securities Commissions) endorsement, the IASC revised ten IASs so that they allow for fewer choices. This so-called Comparability/Improvements project began in 1987 and was completed in 1993 (with the revised IASs effective for 1995 financial statements).

4 In fairness to these authors, several of them mentioned their suspicions regarding the true nature of the IAS 'adoptions'.

5 Note that as of January 14, 2003, the European Union required all firms listed on a regulated market to prepare their consolidated financial statements in accordance with International Accounting Standards, beginning with their fiscal 2005 statements. Comparative IAS information was required for the fiscal 2004 reports prepared under standards other than IAS (Regulation No 1606/2002 of the European Parliament and of the Council).

6 Ashbaugh and Pincus (2001) report that only Finland and Norway have a greater degree of dissimilarity than do France, Sweden, and Switzerland. They also report that Swiss firms, due to the unrestrictive nature of Swiss GAAP, are able to apply IAS without violating Swiss GAAP. The authors also note that French firms are allowed to present domestic GAAP parent-only financial statements, and Swedish firms typically use footnote reconciliations to comply with IAS measurement requirements.

[7] Noncompliance with accounting standards is apparently not limited to IAS noncompliance. Bradshaw and Miller (2002) provide recent documentation of non-U.S. firms' compliance with U.S. GAAP. Using Worldscope's coding of a firm's accounting method choices, they find significant noncompliance with U.S. GAAP prescriptions.

[8] As past Secretary-General of the IASC, David Cairns provides a unique and well-informed perspective on companies' compliance with IAS.

[9] Tower et al. report that the mean compliance for the first measure of IAS compliance (assumed non-applicability) was 90.68 percent, whereas the mean compliance for the second measure of IAS compliance (assumed non-compliance) was much lower at 42.2 percent.

[10] Again, Cairns (1999a) addresses compliance and enforcement (with respect to auditor issues, primarily), but does so primarily as separate topics.

[11] Nearly all of the firms' annual reports were downloaded from the Primark/Thomson website. Primark/Thomson provides online access to images of reports from firms worldwide. A handful of reports missing from the Primark/Thomson database were acquired from sample firms' websites.

[12] While multiple academics assisted in forming the instrument and categorizing the perceived importance of the individual questions, one individual applied the instrument to the entire sample of firms. Time and resource constraints prevented anything other than an instrument "robustness check" performed by two research assistants on a handful of firms' annual reports. The compliance scores generated in these "checks" were consistent with the primary evaluator's scores, thus helping to confirm the internal validity of the instrument.

[13] The scoring mechanism shown in Appendix 1 is part of a larger instrument used to assess the type of audit opinion in the sample firms' annual reports. This instrument is based on the approach Cairns (1999a) used to classify his sample firms' auditor attestations.

[14] Leuz and Verrecchia (2001) examine the benefits of using *either* IAS or U.S. GAAP versus German GAAP. See Chapter 2 for a discussion of their results as well as the results from the other papers referenced in this section.

[15] This speech was given as part of a panel discussion at the American Accounting Association's 1998 Annual Meeting in New Orleans, Louisiana. Mr. de Marez Oyens was primarily addressing the concerns of the International Organization of Securities Commissions (IOSCO)—and specifically the U.S. Securities and Exchange Commission (SEC)—regarding the worthiness of IAS.

REFERENCES

Ashbaugh, H. (2001). Non-U.S. Firms' Accounting Standard Choices. *Journal of Accounting and Public Policy* 20: 129-153.

Ashbaugh, H. and M. Pincus (2001). Domestic Accounting Standards, International Accounting Standards, and the Predictability of Earnings. *Journal of Accounting Research* 39 (December): 417-434.

Auer, K. (1998). The Value Relevance of Earnings Figures Based on IAS, EC-Directives and Swiss GAAP: An Empirical Analysis. Working Paper, (University of Innsbruck, Austria).

Ball, R., A. Robin, and J. Wu. (2003). Incentives Versus Standards: Properties of Accounting Income in Four East Asian Countries, and Implications for Acceptance of IAS. *Journal of Accounting and Economics* 36: 235-270.

Botosan, C. (1997). Disclosure Level and the Cost of Equity Capital. *The Accounting Review* 72 (July): 323-349.

Botosan, C. and M. Plumlee. (2002). A Re-Examination of Disclosure Level and the Expected Cost of Equity Capital. *Journal of Accounting Research* 40: 21-40.

Bradshaw, M. and G. Miller. (2002). Are Detailed Accounting Standards Sufficient to Ensure Compliance? Evidence from Non-U.S. Firms Adopting U.S. GAAP. Working Paper (Harvard Business School).

Cairns, D. (1999a). *The International Accounting Standards Survey 1999: An Assessment of the Use of IASs by Companies, National Standard Setting Bodies, Regulators and Stock Exchanges*. London, LLP Professional Publishing, a trading division of Informa Publishing Group.

Cairns, D. (1999b). Degrees of Compliance – Companies Complying with International Accounting Standards Fall into Nine Different Categories. *Accountancy International* (September): 68-69.

Cairns, D. (1999c). Exceptions to the Rule – Many Companies Opting to Report in Accordance with IASs Disclose Exceptions from Full Compliance. *Accountancy International* (November): 84-85.

Cairns, D. (1999d). "Not Quite Standardised: Readers of Financial Statements Should Beware when Companies Claim to Comply with International Accounting Standards." *Financial Times*, (12 Aug. 1999): 23.

Covrig, V., M. Defond, and M. Hung. (2007). Home Bias, Foreign Mutual Fund Holdings, and the Voluntary Adoption of International Accounting Standards. *Journal of Accounting Research* 45(March): 41-70.

Daske, H. (2006). Economic Benefits of Adopting IFRS or US-GAAP – Have the Expected Cost of Equity Capital Really Decreased? *Journal of Business Finance & Accounting*, 33 (April/May): 329-373.

Daske, H. and G. Gebhardt. (2006). International Financial Reporting Standards and Experts' Perceptions of Disclosure Quality. *Abacus* 42(3-4): 461-498.

Dumontier, P. and B. Raffournier. (1998). Why Firms Comply Voluntarily with IAS: an Empirical Analysis with Swiss Data. *Journal of International Financial Management and Accounting* 9 (3): 216-245.

El-Gazzar, S., P. Finn, and R. Jacob. (1999). An Empirical Investigation of Multinational Firms' Compliance with International Accounting Standards. *The International Journal of Accounting* 34 (2): 239-248.

Gernon, H. and G. Meek. (2001). "Accounting: An International Perspective." (Third Edition), Irwin/McGraw-Hill, New York, NY.

Glaum, M. and D. Street. (2003). Compliance with the Disclosure Requirements of Germany's New Market: IAS Versus US GAAP. *Journal of International Financial Management & Accounting* 14(1): 64-100.

Hope, O.K. (2003). Disclosure Practices, Enforcement of Accounting Standards, and Analysts' Forecast Accuracy: An International Study. *Journal of Accounting Research* 41(May): 235-272.

IASC. (1997). *International Accounting Standards (1997)* (published by the International Accounting Standards Committee, London).

Leuz, C. (2003). IAS versus U.S. GAAP: A (New) Market Based Comparison. *Journal of Accounting Research* 41 (June): 445-472.

Meek, G., C. Roberts, and S. Gray. (1995). Factors Influencing Voluntary Annual Report Disclosures by U.S. and Continental European Multinational Corporations. *Journal of International Business Studies* 26 (3): 555-572.

Murphy, A. (2000). The Impact of Adopting International Accounting Standards on the Harmonization of Accounting Practices. *The International Journal of Accounting* 35 (October): 471-493.

O'Brien, P. and R. Bhushan. (1990). Analyst Following and Institutional Ownership. *Journal of Accounting Research* 28: 55-76.

Raffournier, B. (1995). The Determinants of Voluntary Financial Disclosure by Swiss Listed Companies. *The European Accounting Review* 4: 261-280.

Street, D. and S. Bryant. (2000). Disclosure Level and Compliance with IASs: A Comparison of Companies With and Without U.S. Listings and Filings. *The International Journal of Accounting* (September): 305-329.

Street, D. and S. Gray. (2000a). Challenging Times – A Survey of 162 Companies' Reports and Accounts Highlights the Problem of Enforcing Global Accounting Standards. *Accountancy* (December): 104-106.

Street, D. and S. Gray. (2000b). Observance of International Accounting Standards: Factors Explaining Non-Compliance by Companies Referring to the Use of IAS. An ACCA Funded Research Project: *Preliminary Findings presented at IAAER Research Conference—Kobe, Japan.*

Street, D., S. Gray and S. Bryant. (1999). Acceptance and Observance of International Accounting Standards: An Empirical Study of Companies Claiming to Comply with IASs. *The International Journal of Accounting* 34 (1): 11-48.

Taplin, R., G. Tower, and P. Hancock. (2002). Disclosure (Discernibility) and Compliance of Accounting Policies: Asia-Pacific Evidence. *Accounting Forum* 26 (June): 172-190.

Taylor, M. and R. Jones. (1999). The Use of International Accounting Standards Terminology, a Survey of IAS Compliance Disclosure. *The International Journal of Accounting* 34 (4): 557-570.

Tower, G., P. Hancock, and R. Taplin. (1999). A Regional Study of Listed Companies' Compliance with International Accounting Standards. *Accounting Forum,* Vol. 3 (3): 293-305.

Wallace, R. and K. Naser. (1995). Firm-Specific Determinants of the Comprehensiveness of Mandatory Disclosure in the Corporate Annual Reports of Firms Listed on the Stock Exchange of Hong Kong. *Journal of Accounting and Public Policy* 14: 311-368.

Appendix 1 – IAS Compliance Instrument

The firms' financial statements were evaluated for IAS compliance based on the following Questions and this scoring method:

Obviously compliant	3
Unclear as to compliance	2
Obviously not compliant	1

The questions are in bold below, and are each preceded by the rationale for that particular question or set of questions being included in the IAS compliance instrument:

IAS #2 requires disclosure of either 1) the cost of inventories recognized as expense during the period, or 2) the operating costs, classified by nature. You would usually see the following under each of the two approaches:

Function & COGS	Operating Costs by Nature
COGS	Raw Materials
Distribution expenses	Staff Costs
Selling expenses	Depreciation & Amortization exp.
Gen. and Adm. Expenses	other operating expenses

1-B) Q: Does the entity presents either COGS as a separate expense or it presents operating expenses classified by their nature?

IAS #5 requires the disclosure of each component of stockholder's equity (i.e., share capital, capital paid in excess of par value, revaluation surplus, reserves, and retained earnings) and the changes in these components during the year.

2-B) Q: Does the entity split up the components of stockholder's equity?

3-B) Q: Does the entity provide the changes in the components of stockholder's equity from beginning to end of the year?

IAS #7 requires the presentation of a cash flow statement.

4-A) Q: Does the entity provide a statement summarizing the difference between cash inflows and cash outflows as part of the main financial statements?

IAS #7 also requires that the cash flow statement be split into operating, investing, and financing sections. Note that the cash flows can only be reported on a net basis in one or more of these sections if: 1) the cash flows reflect activities of an individual customer rather the enterprise as a whole, or 2) these are cash receipts and payments for which there is quick turnover, amounts are large, and maturities are short.

5-A) Q: Does the Statement of Cash Flows provide a breakdown of the operating, investing, and financing activities?

IAS #7 also requires that cash flows from the payment/receipt of interest, the payment/receipt of dividends, and the payment of taxes be reported.

6-B) Q: Does the Statement of Cash Flows disclose the payments and receipts for interest, the payments and receipts for dividends, and the payments for taxes?

IAS #7 requires the cash and cash equivalents to be reported as reconciling amounts with the cash reported in the balance sheet.

7-B) Q: Are Cash and Cash equivalents reported on the Statement of Cash Flows as a reconciliation to the cash reported in the Balance Sheet?

IAS #6 and #7 specify that Cash equivalents are short-term, highly liquid interests which can be converted to known amounts of cash and which are exposed to only a small risk of changes in value. The assets included in this section are held for the purpose of meeting short-term cash needs rather than for investment or other purposes. Cairns (1999a) lists the type of assets that one would expect to see classified as Cash equivalents: short-term bank deposits (other than those demand deposits which are instead included in Cash), debt securities with a maturity of three months or less from the date of acquisition, and the few equity securities which are subject to insignificant risks of price changes.

8-C) Q: Does the entity properly include purchases and sales of equity investments in the Investing activities section of the Statement of Cash Flows, rather than erroneously classifying these instruments as Cash equivalents?

IAS #7 also precludes a firm from deducting bank loans (which should be financing activity) and advances to/from parties in the cash and cash equivalents section of the Statement of Cash Flows.

9-C) Q: Are there no bank loans or advances deducted from cash or cash equivalents on the Statement of Cash Flows?

IAS #8 (revised 1995) provides that only rarely would items be placed in the extraordinary items section of the income statement. This requirement would preclude things that are under management's control from being placed in the extraordinary item section (Cairns, 1999a). For instance, these items do not belong in the extraordinary items section: effects of discontinued operations, write-downs of fixed assets, change in accounting principles, utilization of reserves, reorganization costs, foreign currency gains and losses, etc. IAS #8 also requires the disclosure of the nature and amount of each of these extraordinary items.

10-B)Q: Does the entity presents only those items meeting the definition of an extraordinary item in the extraordinary items section of the income statement and is proper justification for their inclusion provided?

IAS # 8 also provides that items such as goodwill amortization and profit sharing charges should be expenses that are deducted in determining profit from ordinary activities (not deducted after profit has been determined).

11-A)Q: Does the entity amortize goodwill and other intangible assets in deriving profit from ordinary activities?

IAS #9 requires that research costs be expensed in the period incurred.

12-A)Q: Are research costs expensed rather than capitalized?

IAS #9 also requires that development costs are expensed unless: 1) product or process is clearly defined and costs attributable to the product or process can be separately identified and measured reliably, 2) the technical feasibility of the product or process can be demonstrated, 3) the entity intends to produce and market or use the product or process, 4) the usefulness of the product or process can be demonstrated, and 5) adequate resources exist to complete the project and market or use the product or process.

13-B)Q: Are the development costs that meet the necessary criteria then capitalized?

IAS #10 requires that no contingent gains are reported unless realization of these gains is a near certainty.

14-B)Q: Are there no contingent gains on the balance sheet?

IAS #14 requires the measurement of segment sales (distinguishable as external or between segment sales), segment profit, segment assets (either in monetary amounts or as a percentage of consolidated totals), and the basis of inter-segment pricing.

15-A)Q: Does the entity provide segment sales, distinguishing external customers from other segments (internal customers)?

16-A)Q: Does the entity provide segment profits?

17-A)Q: Does the entity provide segment assets?

18-B)Q: Does the entity disclose the basis for inter-segment pricing?

IAS #14 requires that the entity choose segments so that an adequate disaggregation of results is achieved.

19-A)Q: Does the entity adequately break down its operations into segments necessary to evaluate do product line and geographic analysis?

IAS #14 also requires a description of both industry segments and geographic segments.

20-A)Q: Does the entity provide a description of its industry segments?

21-A)Q: Does the entity provide a description of its geographic segments?

IAS #16 allows for fixed asset revaluations, but requires increases be taken to reserves and decreases be taken to the income statement (reversals of past increases are taken to the income statement and reversals of past decreases are taken to reserves).

22-B)Q: Does the entity take revaluation increases and reversals of past decreases to reserves, while taking revaluation decreases and reversals of past increases to the income statement?

IAS #17 requires *operating* leases for a lessor to be classified as property, plant, and equipment, while *financing* leases should be classified as a receivable (and not as property, plant, and equipment).

23-C)Q: Does the entity as lessor properly classify its operating and financing leases?

IAS #17 requires that leased assets and related liabilities for a lessee be separately disclosed on the Balance Sheet.

24-B)Q: Does the entity as lessee segregate leased assets and liabilities for leases from other assets and liabilities on the balance sheet?

IAS #18 requires firms to disclosure the accounting policy for the recognition of revenue.

25-A)Q: Does the entity provide the basis for revenue recognition within the notes?

IAS #18 also requires that each significant category of revenue be disclosed, including revenue from: 1) sale of goods, 2) providing services, and 3) interest, royalties, and dividends.

26-A Q: Does the entity provide revenues segregated by source?

IAS #19 requires firms to expense the current service cost (defined benefit) or current contributions (defined contribution) related to its pension plans.

27-A)Q: Does the entity report pension service cost as an expense in the income statement?

IAS #19 also requires the firm disclose a description of the pension plan and provide a statement as to whether or not the plan is funded.

28-A)Q: Does the entity provide a description of its pension plan and state whether or not it is funded?

IAS #21 and SIC (Standing Interpretations Committee) #19 require that exchange rate differences for foreign operations *integral* to the reporting entity be recognized through the income statement. At the date of the transaction, initial recognition should use the transaction-date exchange rate. At subsequent balance sheet dates: 1) monetary items should be reported using the closing rate, 2) nonmonetary items carried at historical cost should be reported using the exchange rate at the date of the transaction, and 3) nonmonetary items carried at fair value should use the exchanges rates in existence when the values were determined.

29-A)Q: Does the entity run gains and losses due to exchange rate differences through the income statement when the foreign operations are deemed to be integral to the reporting entity?

IAS #21 requires that exchange rate differences for foreign operations of *self-sustaining* foreign entities be classified as a separate component of stockholder's equity. Assets and liabilities (both monetary and nonmonetary) are translated using closing rates. Income statement items are translated at the rate in effect when the transaction occurred.

30-A)Q: Does the entity report gains and losses due to exchange rate differences as a separate component of equity (as a reconciliation of exchange differences) when the foreign operation is deemed to be a self-sustaining entity?

IAS #22 requires the Pooling of Interests method be used when there is a uniting of interests and it requires the Purchase method be used for acquisitions.

31-A)Q: Does the entity use the Pooling of Interests method for any uniting of interests and use the Purchase method for acquisitions.

IAS #22 (per 1993 version) requires that goodwill is capitalized and amortized over a period not to exceed five years using the straight-line method, unless a longer period (up to 20 years maximum) can be justified. Any pre-1994 goodwill may have been written off directly to equity (under IAS #22-1983 version).

32-A)Q: Does the entity amortize positive (or negative) goodwill over a period not to exceed 20 years?

IAS #24 requires that related party relationships in which control exists should be disclosed whether or not there have been transactions between the related parties. If there have been transactions between these related parties, the reporting entity should disclose 1) the nature of the relationships, and 2) the types of transactions.

33-C)Q: Does the entity disclose relationships in which they have control, regardless of whether there are transactions or not?

34-B)Q: If there are transactions between related parties, has the reporting enterprise disclosed 1) the nature of the relationship, and 2) the types of transactions?

IAS #25, which was eventually superseded by IAS #39 on financial instruments, required disclosures for the accounting policy for determination of the carrying amounts of investments.

35-B)Q: Doe the entity report its policy for determining the carrying amounts of investments?

IAS #25 also required a disclosure for the accounting policy on the treatment of changes in market value of current investments carried at market value.

36-B)Q: Does the entity report its policy for treating changes in the market value for those current investments carried at market value?

IAS #27 requires that a parent company should present consolidated financial statements.

37-A) Q: Does the entity present consolidated financial statements?

IAS #27 requires minority interest to be shown separately from liabilities and the parent shareholder's equity in the consolidated balance sheet.

38-B)Q: Does the entity present minority interest as a separate component from liabilities and the parent shareholder's equity?

IAS #27 requires that minority interest be shown separately in the consolidated income statement.

39-B)Q: Does the entity report minority interest as a separate component in the consolidated income statement?

IAS #31 requires a number of disclosures when a firm has a joint venture in operations, assets, or entities. However, these rules are specific to each of the three areas, and it is unlikely that a large number of the sample firms will have each of the three arrangements. Consequently, the general question becomes:

40-B)Q: Does the entity provide information about joint operations, joint assets, or joint entities?

IAS #32 (for periods beginning on or after January 1, 1996) requires a firm to, for each class of financial asset or liability, disclose information about the extent and nature of the instruments, including significant terms and conditions that may affect the amount, timing, and certainty of future cash flows.

41-A)Q: Does the entity present information about its financial assets and liabilities so that the amount, timing, and likelihood of future cash flows can be assessed?

IAS #33, effective for fiscal periods beginning on or after January 1, 1998, requires a firm to provide a Basic earnings per share number (net income after extraordinary items – preference dividends) and Diluted earnings per share (Basis E.P.S. after adjusting for dividends deducted in arriving at gross profit, interest, and changes in income or expense from the conversion of potentially dilutive ordinary shares).

42-A)Q: Does the entity report both Basic and Diluted earnings per share figures?

IAS #33 also requires the firm to provide the weighted average number of ordinary shares outstanding for both Basic and Diluted earnings per share.

43-B)Q: Does the entity disclose the weighted average number of ordinary shares used to calculate both Basic and Diluted earnings per share?

The final three questions were added because they dealt with issues specifically noted in Cairns (1999a). These questions were added after consulting the academics and practitioner regarding a proper weighting scheme. Because these questions either do not apply to a large number of firms (#44) or noncompliance was uncommon (#45, 46), all three were assigned the moderate weighting factor (1.5).

44-B) Have prior periods been restating according to IAS when initially adopting IAS?

45-B) Has the company postponed or insufficiently recognized certain standards because "IAS has not developed core standards" or "IOSCO does not yet recognize IAS"?

46-B) Does the company avoided using LIFO to value inventories in one location, but other valuation methods are used for similar inventories in other locations?

Appendix 2 – Audit Report/Acctg Policy Claims

LEGEND FOR AUDIT REPORT/ACCOUNTING POLICY CLAIMS

A. STANDARDS CLAIMED – ACCOUNTING POLICY STATEMENT

IAS	1
Domestic (or just says "GAAP")	2
Combination IAS and Domestic	3
Other (e.g., US GAAP, EU Directives)	4
Silent	5

B. STANDARDS CLAIMED – AUDIT REPORT

IAS	1
Domestic (or just says "GAAP")	2
Combination IAS and Domestic	3
Other (e.g., US GAAP, EU Directives)	4
Silent	5

B1. EXTENT OF COMPLIANCE?

Full compliance	A
Exceptions summarized	B
Exceptions without specifics	C

Appendix 3 – Sample firms

ABB AG
AGA Group AB
Agie Charmilles Holding
Alusuisse-Lonza Holding Ltd.
Ares-Serono SA
Ascom Holding Ltd.
Avesta
BB Biotech AG
BB MedTech
BK Vision Ag
Bossard Holding AG
Calida Holding AG
Canal+
CAP Gemini S.A.
Cementia Holding AG
Christian Dalloz Group
Clariant International, Ltd.
Däetwyler Holding Inc.
Danzas Holding
DMC
Eichhof Holding
Ems-Chemie Holding AG
Esec Holding AG
Esselte AB

Essilor International Compagnie
Forbo Holding SA
Fotolabo SA
Gas Vision AG
Georg Fischer AG
Gurit-Heberlein AG
Hermes International
Holderbank Financiére Glarus LTD.
Interroll Holding AG
Intershop Holding Ltd.
Jelmoli Holding Ltd.
Julius Baer Holding Ltd.
Keramik Holding AG
Kuehne & Nagel International
Kuoni Reisen Holding
Lafarge S.A.
Lagardere
Lectra Systemes
LVMH
Micronas Semiconductor Holding AG
Moulinex S.A.
Mövenpick Holding
Nestlé S.A.
Nextrom Holding SA
Norbert Dentressangle
Novartis AG
Oerlikon Büehrle Holding Ltd.
OM Gruppen
OZ Holding
Pargesa Holding SA
Perstorp AB
Pharma Vision 2000 AG
Phoenix Mecano AG
Phonak Holding Ltd.
Remy Cointreau
Renault
Richemont
Rieter Holding AG
Roche Holding Ltd.
Saint-Gobain
SAIRGroup
SAS
Saurer AG
Scania
Schneider S.A.
SEZ Holding
SGS Société Générale de Surveillance
Siegfried Ltd.
Sihl Zuercher Paperfabrik an der Sihl
Sika Finanz AG
Stora Kopparbergs Bergslags AB
STRATEC Holding AG
Süedelecktra Holding AG
Sulzer Ltd.
Sunstar Holding AG
Swisslog Holding Inc.
Tecan AG
Technip
TEGE SA
Trelleborg AB
Unigestion Holding
Unilabs SA
Union Bank of Switzerland
Valeo SA
Von Roll AG
WMH Walter Meier Holding
Zellweger Luwa

Appendix 4

Cairn's (1999a) Categories

1) Full IAS compliance
2) Full IAS compliance with exceptions specified in the accounting policies
3) Full IAS compliance with exceptions specified in the notes to the financial statements but outside the accounting policies
4) Full IAS compliance claimed but material omissions or exceptions evident from the financial statements
5) Accounting policies comply with IASs or are based on IASs or IAS principles
6) Accounting policies comply with IASs or are based on IASs or the principles in IASs but with specified exceptions from full compliance
7) IASs used only when there are no equivalent domestic standards
8) IASs used only for selected items or when permitted by domestic requirements
9) Reconciliation from domestic GAAP to IASs
10) Summary IAS financial statements (restatement of domestic financial statements
11) Unquantified description of differences from IAS treatments

(Cairns 1999a, p. 10).

RELATIONSHIP BETWEEN ORGANIZATIONAL CAPABILITIES AND PERFORMANCE OF TARGET COSTING : AN EMPIRICAL STUDY OF JAPANESE COMPANIES

Sungkyoo Huh, California State University-San Bernardino
Keun-Hyo Yook, Pusan University of Foreign Studies
Il-woon Kim, University of Akron

ABSTRACT

To implement target costing successfuly, many tools and techniques are required. However, target costing is not a simple combination of these individual tools and techniques, but rather is a dynamic and comprehensive system, integrating all these factors in an efficient way. Previous studies on the performance of target costing in the U.S. viewed target costing as a static system, ignoring interactions among these factors. This study examined relationships between critical success factors and performance of target costing of Japanese companies, using the concept of knowledge layers as the core competence. The results showed that the dynamic capabilities which consist of architectural and process capabilities are a key to the success of target cosing for Japanese companies and closely associated with their competitive advantage over western companies. The local capabilities are also necessary, but not sufficient for the success of target costing. Since the scope and depth of target costing in Japanese companie are a lot more intensive than those in the Western counterparts, the results of this study will provide valuable insights on target costing to the Western companies implementing target costing.

INTRODUCTION

Target costing is officially defined in Japan as an overall profit management process by which quality, price, reliability, delivery term and other targets are set at the time of product planning and development at the levels that meet the perceived customer needs. Achievement of these targets is simultaneously attempted in all areas from the upstream to downstream processes (Japan Accounting Association, 1996). As such, for the last 30 years, target costing has made a significant contribution to many Japanese companies by enhancing their competitive positions in the global market (Ansari and Bell, 1997).

Due to a relatively short history of target costing implementation, low performance of target costing in Western companies can be attributed to two reasons: 1) lack of an empirically proven

theoretical framework and generalized guidelines for implementation and 2) inability in terms of employees' attitude and organizational maturity to adapt to radical changes caused by the introduction of target costing (Yook, 2003). During the last decade, many studies have been conducted using a case approach or questionnaire and helped identify key prerequisites in introducing target costing successfully (Ansari and Bell, 1997; Cooper and Slagmulder, 1999a; Kato, 1993; Tani and Kato, 1994; Tani, 1995). These studies, however, failed to identify the core success factors that should be aggressively managed when target costing is introduced, to find out how to evaluate the performance of target costing once implemented, and to test if a company is ready for target costing. Some of the previous studies defined success factors as a combination of organizational resources and routines developed within the organization, such as necessary tools (e.g., VE, Cost Table, etc.), cross-functional structure, top management support, and a heavyweight project manager.

This study will focus on the organizational capabilities as success factors and examine the relationships between the success factors and the performance of target costing. The main reason for focusing on the organizational capabilities is that target costing is not a collection of tools and techniques, but a dynamic system of connecting them. Organizational capabilities will also show many different aspects of various knowledge accumulated in the organization. Since the scope and depth of target costing in Japanese companies are substantially more intensive than U.S. counterparts, the results of this study will provide valuable insights on target costing to U.S. companies.

PREVIOUS RESEARCH

During the last decade, numerous studies have been conducted on the effectiveness of target costing systems in Japan as well as outside Japan (Kato et. al, 1995). Three different approaches have been generally employed in these studies: descriptive or narrative, analytical, and empirical. Most of the descriptive and empirical studies on target costing were not based on any conceptual foundation of target costing mainly due to the lack of research dealing with theoretical aspects of target costing. This section provides a brief review of existing literature in the three categories.

The majority of the studies on target costing have used the descriptive approach which includes case studies. For example, Tani (1998) and Yoshikawa et al. (1990) explain different kinds of cost tables and their roles in a target costing system. Cost tables are widely known as a major database for target costing activities. Cooper and Slagmulder (1997) discuss VE (value engineering) as the most popular technique used in the target costing process. Another topic studied using the descriptive approach was the determination and allocation of target costs. Koga (1999) uses the concept of product life-cycle costs to demonstrate that actual costs always exceed the target in the target costing process. The studies by Cooper (1995) and Hiromoto (1988) are also representative on this topic. Some studies applied activity-based costing (ABC) to determine and allocate target

costs. For example, Cokins (2002) shows that ABC can provide key cost data to assure the 'target' in target costing is attained. It is well known that target costing is inevitably linked to the development of a new product (1994; Cooper and Slagmulder, 1997; 1999a), and many descriptive studies have been conducted, focusing on this issue.

Like the analytical approach, the empirical approach has not been used much for target costing research. Tani (1994; 1995) and Tani and Kato (1994) argue that the effectiveness of a target costing system depends on the business environment and strategy which determine the organizational structure. Yoshida (2001; 2002) investigates the relationships between critical success factors and performance of target costing, using Japanese companies. He has found that the process and structure of the organization are more important than target costing support tools and that competitive environment is also a major factor affecting the organization's capability to implement target costing successfully.

In a milestone book published by Consortium for Advanced Manufacturing – International, Ansari and Bell (1997) provided intellectual and practical foundations of target costing. They view target costing as an open system that is responsive to customer needs and competitive threats and present six fundamental principles of target costing: price led costing, focus on customers, focus on design, cross-functional involvement, life cycle orientation, and value chain involvement. Ewert and Ernst (1999) present a theoretical analysis of target costing as one of the most prominent approaches of strategic management accounting. They analyze three distinct characteristics of this strategic management accounting tool, namely its market orientation, its use as a coordination instrument and its interaction with other factors affecting long-term cost structure in the form of strategic learning.

ORGANIZATIONAL CAPABILITIES

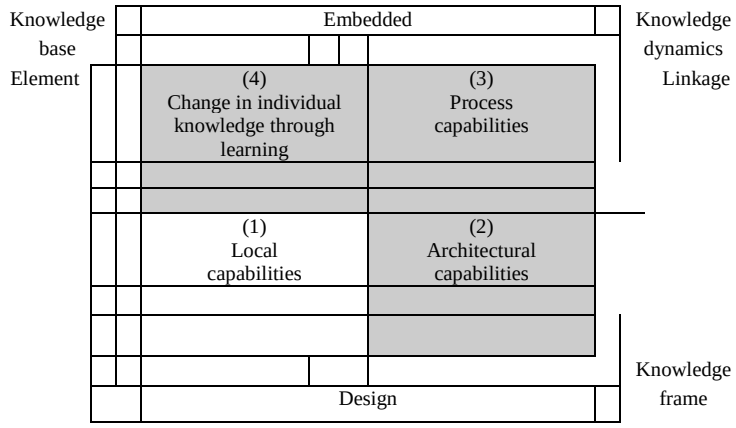
In the markets where the competitive landscape is shifting, the dynamic capabilities by which firm managers integrate, build, and reconfigure internal and external competencies to address rapidly changing environments become the sources of sustained competitive advantage (Teece et al., 1997). While there are many different types of dynamic capabilities, this study is based on the organizational capability model proposed by Kusunoki et al. (1995) due to the fact that their model provides new points of view which are not available in the traditional theories on organizations and corporate strategy. For example, it is well understood that target costing is not a mere combination of individual tools, such as cost tables, value engineering, etc., but is a dynamic system which integrates all these tools. Based on their model, the concept of organizational capability using the multi-level knowledge can be applied to identify the differences between a comprehensive target costing system and a simple combination of individual tools.

In a study on new product development of Japanese companies, Kusunoki et al. (1995) extend the concept of multilayered organization, which was originally proposed by Nonaka (1994), and classify the organizational knowledge into three overlapping layers: knowledge base, knowledge

frame, and knowledge dynamics. First, the knowledge base is a layer of knowledge focusing on individual units of knowledge which is distinguishable based on a specific physical unit. Some examples are functional knowledge obtained by individuals with respect to product development, information processing system, database, and patents. This knowledge base provides an organization with local capabilities. Second, the knowledge frame includes knowledge about mutual relationships among or priority of individual knowledge that has a stable pattern or structure, and is a layer focusing on the organizational structure and strategy determining such a stable pattern. Examples include relationships between multi-functional development groups, power structure, and resource allocation to teams. Organizational capabilities coming from the knowledge frame are called architectural capabilities. Third, knowledge dynamics is another layer which focuses on the dynamic process of combining and changing individual knowledge through interactions among the knowledge. They include communication and coordination across the functions of product development and transfer of engineers who are equipped with specific knowledge. Since organizational capabilities provided by the knowledge dynamics are based on the process of knowledge interactions, they are called process capabilities.

Figure 1 presents the three layers of knowledge capabilities: local, architectural, and process. The organizational capabilities are represented by two dimensions on the horizontal axis: element and linkage. The element represents the capabilities that depend on individual knowledge, and the linkage represents the capabilities that depend on combining the knowledge. The vertical axis shows whether the capabilities can be designed and, therefore, manipulated by managers or embedded in the organization. For example, the process capabilities deal with the linkage of individual knowledge which is embedded in the organization, making them difficult to be designed by managers.

Figure 1: Characteristics of Organizational Capabilities



Note: Translated into English from Kusunoki et al. (1995).

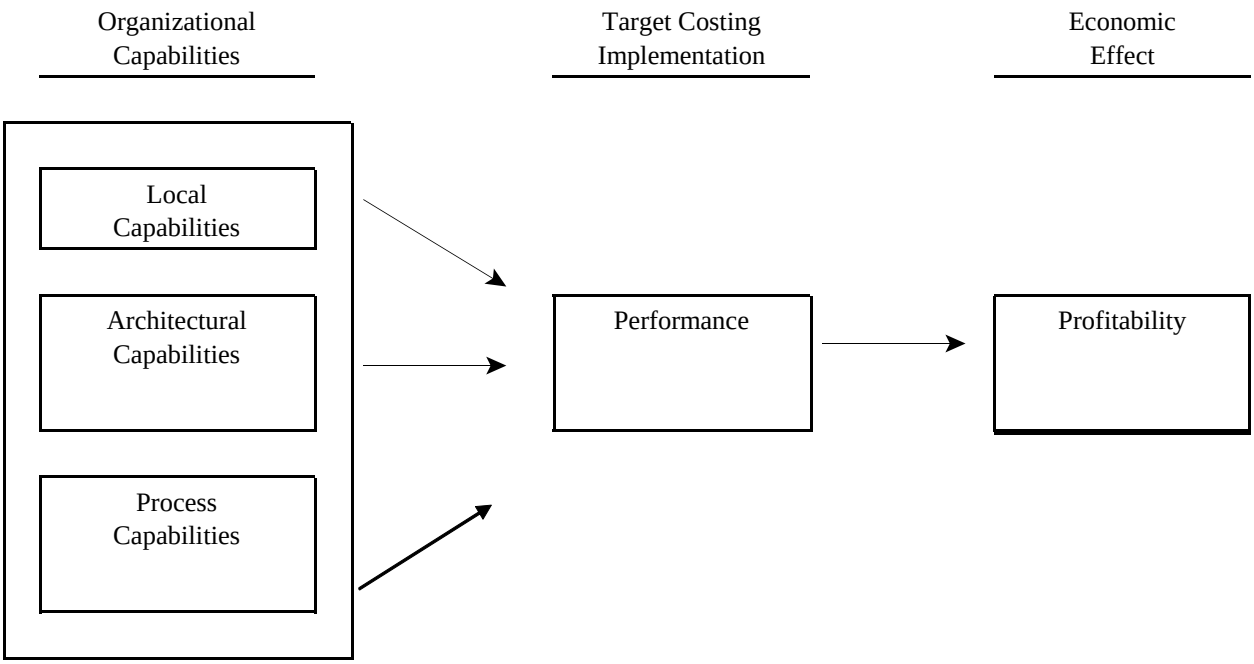
Local capabilities, such as engineers, databases, and patents, can be traded in the market, and managers generally understand each of the local capabilities and can see the results of their interactions. Hence, it can be commonly observed in many organizations to restructure these capabilities toward a more desirable direction. Process capabilities, on the other hand, are very difficult to design and manage by an organization and, therefore, it is almost impossible for managers to find cause-and-effect relationships among these capabilities. Thus, process capabilities are cumulative and path-dependent (Teece, 1988). In terms of their nature, the architectural capabilities are between the local and process capabilities. Compared to local capabilities, architectural capabilities are not clearly visible, but they are transferable to some extent from other successful organizations through imitation and learning because they can be partially manipulated by the design of strategy and organizational structure.

RESEARCH DESIGN

Research Model

Due to the fact that the concept of organizational capabilities has a great potential to contribute to target costing research, the interest in the concept has been increasing significantly during the last decade (Kato, 1993). It was expected that, based on empirical studies using the concept, theoretical and practical implications of target costing would be examined effectively. However, not many studies have been published yet on organizational capabilities, and empirical studies investigating the dynamic nature of these capabilities are almost nonexistent. As stated before, this study applies the concept of the organizational capabilities, as presented by Kusunoki et al. (1995), in testing the performance of target costing. The definitions of organizational capabilities, however, will be modified because of the following two reasons: 1) the concept of cost management is not clearly defined in their model and 2) it is necessary to include the success factors derived from the previous research on target costing. These new definitions will make the model more applicable to target costing research. Hence, for the purpose of this study, the research model is presented in Figure 2. First, there are three levels of organizational capabilities affecting the performance of target costing: local, architectural, and process. As the lowest level, the process capabilities consist of communication, experience and information sharing, and autonomy. The architectural capabilities at the next level are defined as top management support, organizational structure, and link to strategies. The local capabilities consist of database and product technology/knowledge base. It can be conjectured that these organizational capabilities are success factors which will affect the performance of target costing implementation and, consequently, profitability of the company.

Figure 2: Research Model



.

Research Questions

There are two research questions to be investigated in this study. The first is the relationship between target costing performance and three different types of organizational capabilities as defined in Figure 2. This has been an important question among adopters of target costing in Japan to determine whether their infrastructure to implement target costing successfully is well laid out, but no research has been conducted on the significance of the relationship. The second question deals with specific capabilities and examines their relationships with different types of performance. This is an important question because target costing is multi-dimensional, and its performance should be measured from several different perspectives.

Definition of Dependent and Independent Variables

For the purpose of this study, the dependent variables are the performance results of target costing implementation, and the independent variables are local capabilities, architectural capabilities, and process capabilities. Specific definitions and measurement issues are discussed below.

Performance results

In measuring the performance of target costing, twelve variables have been identified based on a comprehensive review of the empirical studies on target costing (Yoshida, 2001; Kubota, 2002; and Yook, 2003, in particular) and then classified into three categories: development and design efficiency, marketability, and cost reduction. First, development and design efficiency is a performance variable concerning the efficient management of R&D and design steps, such as design to cost, improving development/design process, and cost reduction efforts by engineers. Improvement in quality and delivery deals with marketability of new products through improvement in quality and functions, shortening lead-time for new product development, and timely introduction of new products. Finally, cost reduction is a measure for financial achievement through effective product cost management and supply chain management. These three are dependent variables which are used to measure short-term effects of product development, such as increases in sales and profitability.

Local capabilities

Two specific factors are selected to represent the local capabilities of the sample firms in this study: database and product technology/knowledge. These factors show how much personnel, financial, and technological resources are available to implement target costing, compared to those of other competitors, and they are quantitative measures demonstrating the abundance of individual knowledge. Database includes information about VE (value engineering), VRP (variety reduction program which is the standardization of parts and reduction of the number of parts), QFD (quality function deployment) and cost table. Product technology/knowledge includes new technology and materials developed through R&D, manufacturing and quality control process, and employees' knowledge about cost.

Architectural capabilities

Architectural capabilities in target costing consist of three basic elements: the link to strategy, commitment of top management, and organizational structure. These are a collection of lower-level elements associated with strategy or organizational structure that provides a stable pattern of local capabilities in an organization. They also reflect the frame of knowledge that the employees possess.

Process capabilities

To measure process capabilities, three factors have been used in this study: cross-department communication, autonomy, and transfer of experience. These factors represent the dynamic interaction of knowledge within the organization. Cross-department communication demonstrates the frequency of knowledge exchange, and shows how much information exchange and activity coordination take place among the functional departments participating in target costing and product development, such as R&D, production and marketing (Allen, 1977). On the other hand, autonomy focuses on empowering employees, performance evaluation, and tradeoff between organizational integration and coordination. It is a factor that can be used to measure how much empowering and delegation of authority contribute to the performance of employees. Experience transfer refers to knowledge exchange generated by the transfer of experience obtained by employees through their activities in the organization (Kusunoki and Numagami, 1995).

Sample Firms and the Questionnaire

In finding the sample companies, the records of the 1,500 companies listed in the First Section of the Tokyo Stock Exchange were reviewed to check the companies having a target costing department or any department with a similar function, such as cost planning or cost engineering. The First Section lists the companies with Japan SIC codes 6 through 32, representing a wide range of industries from automobile to construction. For the companies that were not clear about the use of target costing based on their organizational structure, phone calls were made to confirm the implementation of target costing. Several companies were actually visited, as needed, for further clarification. In the process, 880 companies were identified as the final sample.

A questionnaire was developed and initially tested by five managers and three academic experts from the fields of cost management and industrial engineering. They were instructed to designate each question as 'Keep,' 'Modify,' or 'Drop' and to comment on the appropriateness of the research constructs. The instruments were revised to reflect feedback from the participants. The final questionnaire consisted of three parts: 18 questions for organizational capabilities as success factors; 14 questions for performance; nine questions for implementation scope and others. Except for demography items, five point Likert scales were used to measure target costing system practices. Respondents were asked to indicate the strength of their agreement with each question. The possible responses included 1, corresponding to none; 5, corresponding to extensive; and NA, not applicable.

The questionnaire was sent to target costing senior managers of all 880 companies. An introductory cover letter, the survey questionnaire, and postage-paid return envelope were mailed to these potential respondents. After the second mailing with a one-month interval, 162 responses

were received with a response rate of 18.4 percent. Phone calls and actual visits helped significantly boost the response rate.

RESULTS OF SURVEY RESPONSES

In this section, the characteristics of the sample firms were first examined. The reliability and appropriateness of the questions were then examined using a factor analysis. Finally, multiple regression analyses were conducted to identify the degree of impact of each success factor on target costing performance.

Sample Characteristics

The sample companies are diversified based on the following statistics: 4.4 percent from steel and metal; 12.7 percent from machine; 16.5 percent from electric and electronics; 31.7 percent from automobile and airplane; 5.7 percent from precision machine; 23.4 percent from construction; 5.6 from other industries. Considering the different industry backgrounds among the sample companies, the performance of target costing can be affected by various factors that are not directly related to the effectiveness of the target costing system in place. In particular, it can be presumed that large companies have more financial and personnel resources than small companies so that the performance result can be biased toward large companies. As an attempt to control the size effect, total revenue was used as a control variable. It has turned out that seventy percent of the companies are large companies, having sales revenue over $3 billion and employees over 5,000.

The average time period of using target costing is about 17 years, which is much longer than the period of the U.S. sample counterparts. In a survey that was conducted in the U.S., 25 percent of 48 companies used target costing for over five years and 50 percent were in the range of 1-3 years (Ansari et al., 1999). The depth of target costing implementation is also very extensive for Japanese companies (70.3 percent for company-wide implementation), compared to that of U.S. companies (only 19 percent for company-wide implementation; Ansari et al., 1999). Seventy-four percent of the sample companies in this study have an official department to support target costing functions, and 65.8 percent have it at the headquarters and 34.2 percent in the factory. (Twenty-four percent have the target costing department at both headquarters and factory.) The average number of employees working full-time for target costing is 23.

Statistical Characteristics of the Dependent and Independent Variables

Correlations among the variables used in this study are presented in Table 1. As expected, all three explanatory variables show a positive relationship with most of the performance results, but the relationship between dysfunction and three organizational capabilities is not statistically

significant. Multicollinearity does not exist among the independent variables. The result of the Durbin-Watson test shows that there is no autocorrelation.

Table 1: Correlations Matrix among the Variables

	Efficiency	Marketability	Cost Savings	Local	Architectural	Process	Dysfunction
Efficiency	1.000						
Marketability	0.318c	.000					
Cost savings	0.429c	0.344c	1.000				
Local	0.199b	0.147	0.404c	1.000			
Architectural	0.372c	0.281c	0.407c	0.527c	1.000		
Process	0.268c	0.365c	0.306c	0.470c	0.448c	1.000	
Dysfunction	0.225c	-0.087	0.171b	0.051	0.023	0.009	1.000
Profitability	0.523c	0.400c	0.377c	0.185b	0.313c	0.203b	0.66

Note: a = significant at P-value < 0.1
b = significant at P-value < 0.05
c = significant at P-value < 0.01

The results of descriptive statistics and factor analyses for independent variables (16 success factors) and dependent variables (12 performance result items) are presented in Tables 2 and 3, respectively. Table 2 shows that the most important success factor among the16 variables is top management support (4.57), followed by tools and information system (4.25), cost estimation (4.22), and information sharing (4.19). Less important factors for Japanese companies are cross-functional transfer of employees (3.32), cooperation with other departments (3.50) and empowerment (3.68). Table 3 shows that, among the three major categories of dependent variables, target costing is most effective for cost reduction (with an average score of 3.81), followed by efficiency (3.68) and marketability (3.22). Individually, production cost reduction (4.02) and cost reduction of raw materials (4.01) both improved most significantly, and timely introduction of new product (3.01) and reducing new product development time (3.05) are the least improved areas by implementing target costing.

In order to test the relationships between three major success factors and target costing implementation results, a set of new measurement items for each success factor was developed based on previous research. Hence, factor analyses based on Varimax were conducted to test the conceptual validity and reliability of newly developed success factors and measurement variables. Using the Eigen value of 1.0 as the base, the result of a factor analysis classified 16 success factors into three major capabilities (i.e., local, architectural, and process), and the explanatory power for each success factor, as measured with factor loading scores, was about 70 percent as an average as presented in the last column of Table 2. Hence, it can be concluded that the classification was

properly done. A similar result was obtained for the performance measures (Table 3). Loading scores of all 12 measures were about 70 percent or above each for most factors. In addition, to check the reliability of the questionnaire of this study, Cronbach's a was used. As presented in Tables 2 and 3, Cronbach's a's of all three success categories and all three measurement categories were about 70 percent or above. In general, when they are greater than 60 percent, they are regarded as being reliable.

Table 2: Descriptive Statistics and Factor Analysis: Independent Variables

Critical Success Factors	Mean	Standard Deviation	Factor Loadings
Local capabilities (Cronbach's a = 0.7553)			
(X1) Tools and information system	4.25	0.67	0.610
(X2) Knowledge about cost	4.04	0.81	0.603
(X3) New technology/materials from R&D	3.83	0.77	0.646
(X4) Technology in production/quality	3.92	0.70	0.629
(X5) Cost estimation capability	4.22	0.59	0.614
(X6) functional knowledge of team members	4.11	0.63	0.498
Average	4.06		
Architectural capabilities (Cronbach's a = 0.6954)			
(X7) Top management support	4.57	0.67	0.582
(X8) Empowered project manager	3.87	0.90	0.541
(X9) Concurrent engineering	3.46	0.90	0.666
(X10) cross-functional team (org. structure)	3.71	0.83	0.674
(X11) linkage to profit planning	4.16	0.71	0.628
Average	3.95		
Process capabilities (Cronbach's a = 0.7071)			
(X12) Cooperation with other departments	3.50	0.76	0.533
(X13) Information sharing	4.19	0.66	0.588
(X14) Cross-functional transfer of employees	3.32	0.78	0.478
(X15) Autonomy of employees	4.03	0.78	0.751
(X16) Delegation of power/responsibility	3.68	0.64	0.755
Average	3.73		

Note: The means are calculated based on the 5-point scale: 1 = none; 2 = slight; 3 = moderate; 4 = substantial; 5 = extensive.

Table 3: Descriptive Statistics and Factor Analysis: Dependent Variables			
Performance Result Items	Mean	Standard Deviation	Factor Loading
Efficiency (Cronbach's a = 0.7823)			
(Y1) Design-to-cost	3.79	0.80	0.678
(Y2) Strengthening design/development process	3.42	0.81	0.805
(Y3) Cost reduction efforts by engineers	3.97	0.68	0.627
(Y4) Improving design/development technology	3.54	0.75	0.761
Average	3.68		
Marketability (Cronbach's a = 0.7272)			
(Y5) Quality improvement	3.47	0.69	0.697
(Y6) Reducing development lead time	3.05	0.76	0.731
(Y7) Product features based on customer needs	3.35	0.72	0.664
(Y8) Timely introduction of new product	3.01	0.69	0.763
Average	3.22		
Cost reduction (Cronbach's a = 0.7225)			
(Y9) Product cost reduction	4.02	0.69	0.604
(Y10) Upstream cost reduction	3.41	0.71	0.607
(Y11) Reduction of raw materials purchased	4.01	0.67	0.499
(Y12) Waste reduction on the factory floor	3.80	0.66	0.840
Average	3.81		
Note: The means are calculated based on the 5-point scale: 1 = none; 2 = slight; 3 = moderate; 4 = substantial; 5 = extensive			

Results of Regression Analyses

Five independent variables (i.e., type of business, firm size, local capabilities, architectural capabilities, and process capabilities) were regressed on the three dependent variables (i.e., efficiency, marketability, and cost reduction), and the results are presented in Table 4. First, marketability (quality and lead time) depends significantly on the architectural and process capabilities of the organization (significant at the five percent and one percent levels, respectively), while local capabilities do not have much impact on marketability. This implies that the stronger the organization's dynamic power becomes, the efforts for improvement of marketability can be more effective. It should be noted that the process capabilities which consist of coordination with other departments, experience and information sharing, and empowerment are the most important variables in improving marketability. One important implication is that simply having abundant

knowledge base within the organization is not enough for improving marketability. Rather, dynamic interaction among the individual knowledge is the key for success. In terms of the relationship between the organizational capabilities and efficiency of new product development and design, the architectural capabilities are the most important variable in improving efficiency (significant at the one percent level), followed by the process capabilities (significant at the five percent level). Like the marketability variable, the local capabilities have turned out to be insignificant. In the case of cost reduction which focuses on the financial aspect of target costing, both architectural and local capabilities are equally important (significant at the one percent level) while the process capabilities are insignificant. It should be noted that the local capabilities have a significant effect on cost reduction. This result implies that database and knowledge base are critical factors in controlling costs in the target costing process.

Table 4: Results of Regression Analysis

Independent Variables	Dependent Variables		
	Efficiency	Marketability	Cost reduction
Business type	0.271 (3.633)c	0.033 (0.431)	-0.053 (-0.726)
Firm size	0.011 (0.151)	0.030 (0.381)	0.160 (2.167)b
Local	-0.053 (-0.586)	-0.113 (-1.223)	0.233 (2.656)c
Architectural	0.328 (3.632)c	0.199 (2.141)b	0.250 (2.839)c
Process	0.160 (1.831)a	0.323 (3.595)c	0.049 (0.573)
F-statistics	8.635	5.780	10.181
R-squared	0.229	0.163	0.257
Durbin-Watson	1.741	1.921	2.188

Note: a = significant at P-value < 0.1
b = significant at P-value < 0.05
c = significant at P-value < 0.01

Based on these results of the regression analyses, it is clear that the architectural capabilities, such as top management support, linkage to profit planning, and a cross-functional team, are the most important variables for successful implementation of target costing. They have a positive relationship with all three major dependent variables: efficiency, marketability, and cost reduction. The next important factor for the success of target costing is the process capabilities, which affect two major dependent variables: improving marketability and efficiency of designing and product development. The impact of the local capabilities is relatively weak on the performance of target costing. This is particularly true for efficiency and marketability for new product development. This finding is consistent with the Kato study (1993), which states that, as target costing support systems (such as cost tables) are becoming well established, employees tend to rely on them more heavily

and consequently deplete the ideas for new product development and design. In sum, it appears that the dynamic capabilities focusing on interactions of individual knowledge are more important on the performance of target costing than the local capabilities that consist of observable individual knowledge.

Increase in sales and contribution margin is also an expected economic return in the new product development. In fact, increase in sales/contribution margin and new product developments have a very high correlation with the sample of this study (factor loading=0.83; Eigen value=1.75). Hence, the economic return was regressed on three independent variables (cost reduction, efficiency of product development, and improvement on marketability) to obtain the following result: adjusted R-squared=0.33; F-statistics=26.02; p-value<0.001. Efficiency and marketability were significant at the 1 percent level, and cost reduction was significant at the 10 percent level. It is apparent that all three variables are important determinants of the short-term economic return of the sample companies. It was also tested if the three types of organizational capabilities could result in dysfunction by employees in implementing target costing, such as burnout of design engineers, increasing conflicts of interest, supplier fatigue, and over-engineering of the product (product diversification, proliferation of options, etc). Empowerment is generally considered instrumental for knowledge creation (Nonaka and Takeuchi, 1995). However, it may result in tiredness of design engineers which is one of the negative aspects of target costing, and this will consequently lead to burnout (Kato, 1993; Cherniss, 1980). It has turned out that no significant correlation exists between the capabilities and dysfunction.

CONCLUSION

Many case studies have been reported in the accounting literature to demonstrate successful implementation of target costing. However, there has been a lack of research from the standpoint of the companies introducing target costing to investigate critical success factors and evaluate the performance of target costing. Therefore, the main purposes of this study were to present a basic framework for understanding the success factors (i.e., organizational capabilities) of target costing based on multiple layers of distinctive individual knowledge and to examine the relationships between the organizational capabilities and performance of target costing for Japanese companies using a questionnaire. It has been shown that the dynamic capabilities are the critical factor for the successful implementation of target costing and that they are closely tied to the competitive advantage of Japanese companies in the global market. More detailed regression analyses show the following three points:

1. the architectural capabilities are significantly related to the all of the performance variables.

2. the process capabilities have a significant impact on the efficiency of design and development and improvement of quality and on-time delivery, but their impact on cost reduction is limited.
3. the local capabilities are significantly related only to cost reduction and show an insignificant relationship with other performance factors.

It can be concluded that the local capabilities are necessary, but not sufficient for the success of target costing and that the dynamic capabilities, such as architectural and process capabilities, are more important in implementing target costing. Traditionally, it has been emphasized that having the right tools and techniques is critical to the success of target costing (Ansari and Bell, 1997, p. 138). This study shows that the software of target costing, such as dynamic capabilities, is more important than the hardware of target costing, such as tools and techniques.

A couple of methodological problems limit the interpretation of the results of this study. First, even though an attempt was made to control the size and type of industries, the industry differences were not investigated due to a lack of information. Second, the sample size was too small, relative to the number of independent variables. It is recommended in future studies to use a control group which consists of companies without a target costing program to see if there would be any differences in results between the sample and the control group. It would be also interesting to do a trend analysis of the same companies to see how the maturity of target costing affects the results of target costing implementation.

REFERENCES

Allen, T. J., (1977), *Managing the Flow of Technology*, MIT Press.

Ansari, S. L., J. E. Bell. (1997), *Target Costing: the Next Frontier in Strategic Cost*, MIT Press,

Ansari, S.L., I. Kim & D. Swenson. (1999), *Target Costing Best Practices Report*, The Consortium for Advanced Manufacturing-International.

Cherniss, C. (1980), *Staff Burnout*, Sage Publications.

Cokins, G. (2002), "Integrations of Target Costing and ABC", *Journal of Cost Management*, 6(4), 13-22.

Cooper, R. (1995), *When Lean Enterprises Collide*. Harvard Business Schoo1 Press.

Cooper, R. & R. Slagmulder. (1997), *Target Costing and Value Engineering*, Productivity Press.

Cooper, R. & R. Slagmulder. (1999:a), "Develop Profitable New Products with Target Costing", *Sloan Management Review*, 40 (4), 23-33.

Ewert, R. & C. Ernst. (1999), "Target Costing, Co-ordination and Strategic Cost Management",

Hiromoto, T. (1988), Another Hidden Edge: Japanese Management Accounting, *Harvard Business Review*, 66(4), 22-26.

Japan Accounting Association. (1996), *Genka kikaku kenkyuu no kadai* (The future direction of target cost management research), in Japanese, The Report of the Special Committee on Target Cost Management, Moriyama Shoten, Japan.

Kato, Y. (1993), *Genka kikaku: senryakuteki kosuto manejimento (Target Costing: Strategic Cost Management,)* in Japanese, Nihon Keizai Shimbunsya, Japan.

Kato, Y., G. Boer & C. W. Chow. (1995), "Target Costing: An International Management Process", *Journal of Cost Management*, 9 (1). 39-52.

Koga, K. (1999), *Determinants of Effective Product Cost Management during Product Development: Opening the Black Box of Target Costing*, Working Paper, Waseda University, Japan.

Kubota, Y. (2002), "Interorganizational Interactive Control Systems in Target Cost Management", *The Journal of Cost Accounting Research*, 25 (21), 10-19.

Kusunoki, K., I. Nonaka & A. Nagata. (1995), *Nihon kigyou no seihin kaihatsu ni okeru soshiki nouryoku* (Organizational capabilities in product development of Japanese firms), in Japanese, Soshiki kagaku, 29 (1), 92-108.

Kusunoki, K. & T. Numagami. (1995), "Interfunctional Transfers of Engineers in a

Nonaka, I. (1994), "A Dynamic Theory of Organizational Knowledge Creation", *Organization Science*, 5 (1), 14-37.

Nonaka, I. & H. Takeuchi. (1995), *The Knowledge Creating Company: How Japanese Companies Create the Dynamics of Innovation*, Oxford University Press.

Tani, T. (1994), "How Japanese Companies are Preparing and Using Cost Tables", *Working paper presented at EAA 21st Annual Congress,* Antwerp, Belgium.

Tani, T. (1995), "Interactive Control in Target Cost Management", *Management Accounting Research*,.6 (4), 399-414.

Tani, T. (1998), "How Japanese Companies are Preparing and Using cost Tables", *Working Paper presented at EAA 21st Annual Congress*, Antwerp, Belgium.

Tani, T. & Y. Kato. (1994), "Target Costing in Japan", *Neuere Entwicklungen im Kostenmanagemen*t, edited by K. Dellman and K. P. Franz, Verlag Paul Haupt, 191-222.

Teece, D. J. (1988), *Technological Change and the Nature of the Firm, Technical Change and Economic Theory*. Edited by G. Dosi, C. Freeman, R. Nelson, G. Silverberg and L. Soete. Francis Printer, London.

Teece, D.J., G. Pisano & A. Shuen. (1997), "Dynamic Capabilities and Strategic Management", *Strategic Management Journal*, 8 (7), 509-533.

Yook, K. H. (2003), "The Effects of Group Maturity and Organizational Capabilities on Performance of Target Cost Management", *The Journal of Management Accounting*, 11 (1), 3-14.

Yoshida, E. (2001), "Relationship between Performance and Organizational Capabilities in Target Cost Management", *The Journal of Management Accounting*, 10 (1), 39-52.

Yoshida, E. (2002), "Empirical Study about the Relationship between Organizational Capabilities for Target Cost Management and Performance: Comparison among Three Divisions at a Japanese Electric Company", *The Journal of Cost Accounting Research*, 25 (2), 1-9.

Yoshikawa, T., J. Innes & F. Mitchell. (1990), "Cost Tables: a Foundation of Japanese Cost Management", *Journal of Cost Management*, l, 30-36.

ORGANIZATIONAL COMMITMENT RECALL IN TIMES OF CRISIS

Leila Messarra, Lebanese American University
Silva K. Karkoulian, Lebanese American University

ABSTRACT

After a crisis, employees' organizational commitment may be affected. This research examined the effect of a war crisis on the commitment of employees using Meyer and Allen (1997) three component model of commitment that is, affective, continuous and normative commitment.

The study was carried out in a Middle Eastern country (Lebanon) that witnessed a 33 day war starting July 12, 2006 (now referred to as the "July War") that caught its citizens and businesses by surprise. Daily activities were disrupted and unforeseen financial loses were incurred.

Participants were 244 professionals working in medium sized companies in the retail sector. The survey took place during the month of November, 2006, 4 months after the crisis.The results indicated that after a crisis, overall commitment did not change. However, affective and normative commitment increased while continuous commitment decreased. The three types of commitment were also affected by gender and status. Further studies should explore whether the same results apply to non-professional employees, to other sectors, returning troops, and after local upheavals.

Keywords: Commitment, Crisis, Gender, Status.

INTRODUCTION

An organization is not simply the physical and financial assets structure, but also the people who are committed to work and integrate within the organization on the basis of a mutually dependent relationship. The focal point of every organization therefore is its human resources. The management of the actions and interactions of the individuals across all levels within both the micro as well as the macro environment, will affect the performance of the organization, and its ability to cope with both favorable and unfavorable events.

The word crisis is derived from the Greek word "*krisis*", meaning decision, or judgment (Preble, 1997). When a crisis occurs within an environment/organization, it usually disrupts daily activities and can generate fear of financial loss (Ren, 2000). The impact on the organization could be immediate or long-term (Paraskevas, 2006); thus coping measures i.e decisions and judgments, must be formulated in advance in order to minimize its negative effect. According to Fink (1986) an organization should plan for a crisis by artistically eliminating a great deal of the uncertainty and

risk in order to have more control over its fate. Unfortunately, not all potential crises can be planned for as they can be created by unpredictable outside forces or events which no amount of planning can foresee.

The Lebanese economy witnessed favorable economic conditions prior to the "July War" referring to the 2006 Lebanese-Israel conflict which lasted 33 days (July 12-August 13). Even though the first two quarters of 2005 witnessed slow growth, seven percent increase in GDP was reported between July 2005 and June 2006 which stimulated both European and Arab investment as well as tourism (InfoPro, 2006). Lebanese foreign direct investment had increased as Arab investors have been looking for non Western opportunities and Lebanon seemed like a good prospect for investing their cash surpluses. Cash surplus also quadrupled in the country during the first half of 2006 compared with the same period of 2005 reaching $2.5 billion by June 2006 (InfoPro, 2006). The Tourism Minister at the time had anticipated 1.6 million visitors to Lebanon during 2006 double that of 2005 and expected to generate more than $2 billion in revenues from this sector alone. Hence, businesses such as retailers, hotels, residential buildings and beach resorts invested billions of dollars in anticipation for a 'booming' summer (Lebanon Wire, 2007). However, the "July War" caught Lebanon by surprise, incurring unforeseen financial loses and disrupting daily activities thus decreasing revenues and potentially causing major job losses, and general disruption. The impact of this unexpected war, which has created both an economic and a cultural crisis, is expected to last for a long time.

LITERATURE REVIEW

Employees' commitment to their organization may be affected following a crisis. With Commitment literature telling us that job performance and commitment are positively related (Riketta, 2002;Chen, Silverthome, Hung, 2006), it is then imperative that we examine the effect of a crisis such as war on the employee's commitment defined in the current research as the employee's goal to remain with the organization (Meyer & Allen,1997).

Meyer & Allen (1997) suggested a three-component model of commitment and developed a scale to measure them which is generally representative across different cultures (Ko, Price, & Mueller, 1997; Sulimand, & ILes, 2000). (a) Affective commitment involves the recognition, participation and emotional attachment with the organization leading to the sentiment of wishing to remain employed in the organization; (b) Continuance commitment, founded on the bases of profit coupled with continued participation on one hand, and the cost coupled with leaving on the other hand (Kanter, 1968) creating a desire for wanting to continue employment; (c) Normative commitment, involves an emotional obligation towards the organization i.e. a person should continue employment.

Past research have examined the effects of factors such as downsizing, stress, and job insecurity on employees' commitment. Research evidence indicates that downsizing is associated

with decreased Organizational commitment (Farrell, 2003; T.D.Allen et al., 2001; Ligon et al., 2000). Thornhill, Saunders, & Stead (1997) studied the influence of organizational downsizing on employees who survived the process. They reported that during downsizing, the employees' commitment decreased and was affected by 5 factors: "need for fairness and perceived justice, creation of appropriate line management styles and skills to support the transitional period, open and realistic communication to support the planning and implementation stages, demonstration of meaningful senior management commitment to the changes, and a clearly defined direction to help to alleviate survivors' uncertainties "(Thornhill, Adrian, Sanders, Mark and Stead, Jo, 1997, p. 8) . However, Mathieu and Zajac (1990) suggested that highly committed employees may experience greater negative reactions after organizational downsizing than less committed employees would experience.

Montgomery et al. (1996) examined the effect of job stress in the financial service profession on 288 stockbrokers in the US and concluded that excessive job stress decreases productivity and commitment. Gaither (1999) studied the effect of commitment as a mediating factor on job stress on 1,088 pharmacists in the US. He concluded that as commitment increased it decreased job turnover intention by reducing the negative effects of job stress. Youssef (2000) found that the level of commitment to the organization is positively influenced by job performance in 447 participants operating in various industries in the United Arab Emirates. In addition, Sager (1990) found that organizational commitment negatively influenced job stress.

Job insecurity can have serious consequences for the organization too. Reduced commitment and high turnover intentions are some of such consequences which might threaten organizational stability (Robinson and Rousseau, 1994). Rosenblatt and Ayalla (1996) investigated the job security effect on employees' attitudes toward work. Their findings showed that job insecurity had a negative effect on perceived organizational support, intention to leave, organizational commitment, and resistance to change.

In sum, downsizing, job stress, and job insecurity are all seen by the employees as negative experiences and have been associated with reduced commitment which might threaten organizational stability. Since the war crisis is a negative occurrence does it then similarly lead to reduced organizational commitment? What if employees were asked to recall their previous commitment to the organization before the crisis and contrast it with their commitment after the crisis? Would the result lead to a reduction in organizational commitment?

When individuals are asked to recall experiences or thoughts that they have previously had at a certain time and contrast it with the present, they usually rely on their memory to recollect past events, thoughts and/or opinions. However, they find it difficult to accurately retrieve incidents or thoughts that happened previously because memory traces in individuals are poor accounts of the initial percept (Green, 2004). When the memory of an event is brought back to consciousness, new facts may have been added to the previous event. Individuals' perception of the present is in part

affected by past experiences they have had (Luthans, 2005) making their perceived memory their real memory which can impact current decisions.

The present study theorizes that after a crisis such as war, organizational commitment will be lower based on the recalled accounts of its employees.

SAMPLE AND MEASUREMENT

Two hundred- forty- four of the 300 surveyed professionals working in medium sized companies in the retail sector in Lebanon completed the survey. The response rate was 81.3% of which 45.9% were females and 54.1% males.

The survey took place during the month of November, 2006, 4 months after the crisis (before the crisis - after the crisis = 4 months).

The Component-model of Commitment developed by Allen & Meyer (1990a, 1997) was used in this research for it was specifically designed to measure the three types of commitment to the organization; i.e. Affective, Continuance, and normative commitments. The Component-model of Commitment is a widely used and intensively tested scale ex. Culpepper, 2000; Jaros, 1997. It includes 24 items, 8 items per commitment type. Respondents were requested to specify their responses to the items using a seven-point Likert scale both before the crisis and after the crisis. The scale anchors were labeled (1) strongly agree to (7) strongly disagree with (4) for neutral.

The questionnaire also included 2 demographic questions that asked about gender and status as potential mediating factors.

FINDINGS

In accordance with previous researches on organizational commitment using Allen & Meyer (1990a, 1997) three component model of commitment, subscales of the questionnaire showed high reliability among each other. Reliability for affective commitment before the crisis was alpha = 0.896 and after the crisis, alpha = 0.934. For continuance commitment, reliability before the crisis was alpha = 0.757 and after the crisis alpha = 0.793. Also, for normative commitment, reliability before the crisis was alpha = 0.715, and after the crisis alpha = 0.730.

In order to assess the level of commitment after the crisis and participants' recall before the crisis, we conducted pair-wise t-tests. First, the researchers examined the change in the overall commitment levels averaged across all the subscales. Second, the test measured the different commitment levels after and before the crisis per commitment type i.e. affective, continuance, and normative commitments in order to study the effect the crisis had on the different types of employees' commitment.

Table 1: Mean and Standard Deviation Scores for the Different Types of Commitment				
Types of Commitment	Mean BC	S.D BC	Mean AC	S.D AC
Affective commitment	2.959	1.151	3.8975	1.592
Continuance Commitment	4.3299	1.036	2.7807	1.141
Normative Commitment	3.7746	0.884	4.2623	1.0586
Average	3.687	1.0236	3.646	1.264
BC=before crisis, AC=after crisis				

When comparing the overall commitment mean before and after the crisis, results showed that it changed slightly (After the crisis Mean 3.646; before the crisis Mean = 3.687) indicating that the overall employees' commitment did not change much. Nevertheless, when the different types of commitment were measured the results were as follows: (see Table-1)

Affective Commitment

The pairwise t-test revealed a statistically significant increase in participants' level of affective commitment from before the crisis (M = 2.959, SD=1.151) to after the crisis (M=3.8975, SD=1.592, t (243) =11.135, p<0.001, r=0.58). The eta squared statistic (0.33) indicated a large effect size.

Affective commitment showed no significant correlation with gender and status before the crisis. After the crisis, also no significant correlation was found with status; however, gender had a negative correlation (see Equation 1).

Equation 1 - Affective commitment After War = 4.925 – 0.552 Gender
0.008

Continuance Commitment

The pairwise t-test revealed a statistically significant decrease in participants' level of affective commitment from before the crisis (M = 4.3299, SD=1.036) to after the crisis (M=2.7807, SD=1.141, t (243) =-15.882, p<0.001, r=0.023). The eta squared statistic (0.50) indicated a large effect size.

Continuous commitment showed a significant positive correlation with status and a negative correlation with gender before the crisis (see equation 2). However, after the crisis, gender only had a significant positive correlation (see Equation 3).

Equation 2 - Continuance commitment before the war = 4.359 +1.312 Status-0.461 Gender
0.000 0.000

Equation 3 -Continuance commitment after the war = 2.382+ 0.349 Gender
0.02

Normative Commitment

The pairwise t-test revealed a statistically significant increase in participants' level of normative commitment from before the crisis (M = 3.7746, SD=0.884) to after the crisis (M=4.2623, SD=1.0586, t (243) =9.401, $p<0.001$, r=0.66). The eta squared statistic (0.266) indicated a large effect size.

The causal relationship between each type of commitment and the mediating factors (i.e. gender and status) were then analyzed using regression analysis.

Normative commitment showed a significant positive correlation with gender (see Equation 4) and no significant correlation with status before the crisis. However, after the crisis, no significant correlation was found with either status or gender.

Equation 4 -Normative commitment before the war = 4.034+ 0.424 Gender
0.000

DISCUSSION

The present study hypothesized that after a crisis such as war, organizational commitment will be lower based on the recalled accounts of the employees. The researchers assessed organizational commitment at two points in time, one before the crisis and one after the crisis. The results indicated no overall change in commitment level. This is contrary to past research on the after effect of negative occurrences such as downsizing, job stress and job insecurity which suggested a reduction in commitment level (Farrell, 2003; Ligon et al., 2000). An explanation could be that the Lebanese people may have adapted to living in an unstable environment. Nevertheless, the different components of commitment had varying results. There was a significant increase in participants' level of commitment for the affective commitment subscale as compared to its recalled level before the crisis. This increase could have been as a result of participants' emotional attachment to the organization after surviving the crisis leading to the sentiment of wanting to continue employment.

Results also indicated a significant decrease in participants' level of commitment for the continuous commitment subscale as compared to its recalled level before the crisis. This decrease could have resulted from participants' increased feeling of physical insecurity as a result of the war which could have outweighed the costs associated with leaving their organization and thus might have caused them to consider leaving. There was also a significant increase in participants' level of commitment for the normative commitment subscale as compared to its recalled level before the crisis. This could have resulted from participants' feeling of obligation towards their organization after such a crisis for they were still employed.

The researchers also examined the effect of gender and status on participants' level of commitment. Status correlated positively with continuous commitment before the crisis but showed no correlation after the crisis. Before the crisis, part-time employees were probably committed to the organization hoping to become permanent employees thus the profit coupled with continued participation before the war outweighed the cost associated with leaving. This is contrary to a study by Van Dyne and Ang (1998) on professional workers in Singapore which found that contingent workers had lower affective commitment to their organization. However, the crisis could have decreased their chances to become full time employees and as a result affected their continuous commitment level. On the other hand, affective commitment was not gender specific before the crisis. Nevertheless, males had a positive relation with affective commitment after the crisis as opposed to females. As for continuance commitment, before the crisis, males had a positive relationship with continuous commitment while females had a negative relationship. However, after the crisis, females had a positive relationship. Finally, females and normative commitment were positively related before the crisis while males negatively related. No gender specific relation existed after the crisis. A possible reason to explain this is the more active presence of women in the workforce since 1970s caused by cultural development and increased educational levels. Added to this, the heavy migration of Lebanese men to the gulf countries and the cultural pressure exerted on them to secure their future careers and bear their social responsibilities as primary family earners (Ghazi, 1997). In comparison, studies have difficulty arriving to agreement relating gender and commitment. Some studies have reported that men are less committed then women (Gould, 1975) while others reported the opposite (Marsden, 1993; Aranya, et al, 1986).

CONCLUSION AND LIMITATIONS

The level of organizational commitment may change depending on the form of commitment under certain circumstances such as a crisis. The results from this study indicated that after a crisis, affective and normative commitment levels increased while continuous commitment decreased. Gender and status were mediating factors that could have contributed to the change.

This study took place in Lebanon after the "July War", which could be Culture specific and/or situation specific. Pparticipants' recollection may have been influenced by their current

emotions which could have been still high at the time of the investigation. Nevertheless, the findings indicate that human resource managers need to pay more attention to the effect of negative events or crisis on the commitment level of employees and plan ahead for such occurrences to minimize its negative impact.

The outcome from this research adds to the general body of literature on commitment and furthers our awareness on the impact of crisis on the commitment of employees. With the war used as a crisis, further studies are needed to see whether other kinds of crisis would yield the same or different results.

Finally, the findings of this research are based on responses of a relatively small sample of professional employees in medium size companies in the retail sector in Lebanon. As such, the findings can not be generalized to all Lebanese professionals. This study need not be restricted only to this crisis. Further studies should explore whether the same results apply to non-professional employees, to other sectors, returning troops, and after local upheavals.

REFERENCES

Allen, N. J. and J. P. Meyer (1990). The Measurement and Antecedents of Affective, Continuance, and Normative Commitment to the Organization. *Journal of Occupational Psychology,* 63, 1-18.

Allen, T. D., D. M. Freeman, J. E. Russell, R. C. Reizenstein & J. O. Rentz (2001). Survivor reactions to organizational downsizing: Does time ease the pain?. *Journal of Occupational and Organizational Psychology*, 74,145-164.

Aranya, N., T. Kushnir & A.Valency (1986). Organizational Commitment in a Male-dominated Profession. *Human Relations*, 39, 433-448.

Chen, J., C. Silverthome & J. Hung (2006). Organization Communication, Job Stress, Organizational Commitment, and Job Performance of Accounting Professionals in Taiwan and America. *Leadership & Organization Development Journal* , 27 (4), 242-249.

Culpepper, R. A. (2000). A Test of Revised Scales for the Meyer and Allen (1991) Three- Component Commitment Construct, *Educational and Psychological Measurement*, 60 (4), 604-616.

Farrell, M. A. (2003). The Effect of Downsizing on Market Orientation: The Mediating Roles of Trust and Commitment, *Journal of Strategic Management*, 11 (1), 55-74.

Fink, S.(1986*). Crisis Management: Planning for the Inevitable*, American Management Association, New York.

Gaither, C. A. (1999). Career Commitment: A Mediator of the Effects of Job Stress on Pharmacists' Work-Related Attitudes. *J Am Pharm Assoc*. 39 (3), 353-61.

Ghazi, A. (1997). Lebanon's Culture, retrieved December 2, 2007 from, http://www.ghazi.de/society.html

Gould , S. (1975). *Correlates of Organization Identification and Commitment*. Unpublished doctoral dissertation, Michigan State University.

Green, M.(2004). Eyewitness Memory is Unreliable, Visual Expert Human Resources from, www.visualexpert.com/Resources/eyewitnessmemory.html

InfoPro (2006), Economic Impact of the July 06 War and Steps Towards Recovery. InfoPro, Lebanon, from http://www.infopro.com.lb/publication_economicimpactwar2006.asp

Jaros, S. J.(1997). An Assessment of Meyer and Allen's (1991) Three- Component Model of Organizational and Turnover Intentions, *Journal of Vocational Behavior*, 51 (3), 319-337.

Kanter, R. M.(1968).Commitment and social organization: a study of commitment mechanisms in Utopian communities, *American Sociological Review*, 33, 499-517.

Ko, J., J. L.Price & C. W. Mueller(1997). Assessment of Meyer and Allen's Three Component Model of Organizational Commitment in South Korea, *Journal of Applied Psychology*, *82* (6), 961-973.

Lebanon Wire (2006), Lebanon expects $2b from tourism. *Lebanon Wire*, from www.lebanonwire.com/0606MLN/06062222DPM.asp

Ligon, E., J .Thomas & T. Worrall(2000) .Mutual Insurance, Individual Savings and Limited Commitment, *Review of Economic Dynamics*, 3(2), 21-246.

Luthans, F.(2005).*Organisational behaviour* , McGraw Hill, New York.

Mathieu, J. & D. Zajac (1990).A Review and Meta-Analysis of the Antecedents, Correlates and Consequences of Organizational Commitment, *Psychological Bulletin*, 108, 171-194.

Marsden, P. V., A..L. Kalleberg & C.R.Cook(1993). Gender Differences in Organizational Commitment: Influences of Work Positions and Family Role, *Work and Occupations*, 20(3), 368-390.

Meyer, J. P. & N.J. Allen(1997). *Commitment in the Workplace: Theory, Research, and Application.* Sage Publications, Thousand Oaks.

Montgomery, D. C.,J.G. Blodgett & J.H. Barnes(1996).A Model of Financial Securities Salespersons' Job Stress, *The Journal of Services Marketing*. 10 (3), 21-38.

Paraskevas , A.(2006). Crisis Management or Crisis Response System?, *Management Decision*, 44 (7), 892-907.

Preble, J.(1997).Integrating the Crisis Management Perspective into the Strategic Management Process, *Journal of Management Studies*, 34(5) 769-791.

Ren, C.(2000).Understanding and Managing the Dynamics of Linked Crisis Events, *Disaster Prevention and Management*, 9(1),12-17.

Riketta, M.(2002).Attitudinal Organizational Commitment and Job Performance: A Meta-Analysis, *Journal of Organizational Behavior*, 23(3), 257-266.

Robinson, S. L. & D.M.Rousseau (1994).Violating the Psychological Contract: Not the Exception but the Norm, *Journal of Organizational Behavior*, 15, 245-59.

Rosenblatt, Z. & R. Ayalla (1996).A Test of a Multidimensional Model of Job Insecurity: The Case of Israeli Teachers, *Journal of Organizational Behavior*, 17, 587-605.

Sager, J. K.(1990). Reducing Sales Manager Job Stress, *The Journal of Consumer Marketing*, 7(4), 5-14.

Sulimand,A.M. & P.A . Iles (2000).The Multi-Dimensional Nature of Organizational Commitment in a non-Western Context, *Journal of Management Development.* 9(1), 71-82.

Thornhill, A.,M. Sanders & J.Stead (1997).Downsizing, Delayering - but Where's the Commitment?: The Development of a Diagnostic Tool to Help Manage Survivors . *Personnel Review*, 26 (1), 81-98.

Van Dyne, L. & S. Ang (1998).Organizational Citizenship Behavior of Contingent Workers in Singapore, *Academy of Management Journal*, 41,692-703.

Youssef, D.(1998).Satisfaction with Job Security as a Predictor of Organizational Commitment and Job Performance in a Multicultural Environment, I*nternational Journal of Manpower*, 19 (13),184-194.

AN APPLICATION OF EIGENVECTOR SCALING METHOD TO CURRENCY EXCHANGE RATE DATA IN SHORT-TERM FORECASTING.

Maurice K. Shalishali, Columbus State University

ABSTRACT

An eigenvector scaling technique was conducted for selected currencies to establish a central tendency relationship among currencies. It was concluded that the method applicability in defining trends was suitable for short-term forecasting. While caution must be exercised in applying and interpreting the result, this information is useful in predicting the direction of currency value ratios.

INTRODUCTION

Exchange rate fluctuations and interest rate disparities represent one of the most challenging problems affecting consumers, businesses, and the world economy in general. They can create inefficiencies and distort world prices. Moreover, the long term profitability of any investment, export opportunities and price competitiveness imports are all impacted by long-term movements in exchange rates. Therefore, international businesses engaging in foreign exchange transactions on a daily basis could benefit from knowing some short-term foreign exchange movements.

Exchange rate economics however remains one of the least understood and most controversial areas of economics. It is often argued that it is futile to attempt to forecast foreign exchange rates because the foreign exchange market is an efficient market (Goodman, 1979) and therefore historical exchange rate data hold no information in predicting future values in the market. Most economists believe that there is no reliable method available to forecast exchange rates (Paul Krugman and Maurice Obstfeld, 1994). Nevertheless, the business community has to form expectations about the short-term trends of exchange rates, their underlying tendencies and patterns in order to reach good and sound business decisions.

LITERATURE REVIEW, EVIDENCE OF FOREIGN EXCHANGE MARKET EFFICIENCY, AND OBJECTIVE

The recurring question to researchers has been to agree whether or not the foreign exchange market is an efficient market. Early studies tested randomness of exchange rates (Poole, 1967) and found the theory of random walk to be inconsistent with the interest rate parity theory. Although,

it remains true that time series for the major nominal exchange rates over recent float are extremely hard to distinguish from random walks (Michael Musa, 1984). Other empirical studies of exchange market efficiency have examined the profitability of trading or filter rules. Drawing from the concept of speculative runs, a currency that has risen significantly is likely to rise and a currency that has fallen significantly will continue to fall. Logue and Sweeney (1978) tested the profitability of filter rules. A simple *k*-percent filter rule consists in buying a currency after it has risen k-percent from its previous low and sell it after it has fallen *k*-percent from its previous peak. Results showed the rule yielding marginal profits as compared with a buy and hold strategy. A number of studies do indicate profitability of filter rules (Dooley and Jeffrey Shaffer, 1983, Levich and Lee Thomas, 1993). If rules that are consistently profitable can be found over a reasonable period of time, then the market is not efficient.

Current theories explaining the relationship between the values of two currencies can be revisited and each time pin down disagreements and limitations surrounding them as tests have been more or less unconvincing through out the literature. Economists do not possess reliable methods of forecasting exchange rates over short time horizons such as days or weeks. The numerous methods available for forecasting can be categorized into four general groups: (1) technical, (2) fundamental, (3) market-based, and (4) mixed. Technical analysis involves use of the historical data to predict future values. I t is based on systematic patterns in the exchange rate. If this pattern over time appears random, then the technical forecasting is not appropriate (Madura 1995). Fundamental forecasting, a model based, is one of the numerous methods available for forecasting exchange rates. It is based on relationships between economic variables and exchange rates. Current values of economic factors along with their historical impact on the currency can lead to an exchange rate projection that is useful in deciding whether an international business should hedge or not future payables and receivables in foreign currency. Fundamental economic forces (such as purchasing power parity and balance-of-payment disequilibrium, interest rate parity, interest rate theory of exchange expectations) usually take much longer, often several years, to have an effect on exchange rates. Nevertheless, the business community has to form expectations about the short-term trends of exchange rates. Because these expectations are formed by market sentiment, trends can be extrapolated. The process of developing forecasts from market-based forecasting is usually based on either (1) spot rate or (2) forward rate. The spot rate is the current exchange rate of currency. To understand why the forward rate can serve as a forecast of the future spot rate, consider the following example. Assume a 30-day forward rate of the euro is $1.38 and the general expectation of the speculators is that the future spot rate of the euro will be $1.43 in 30 days. If the speculators expect the future spot rate to be $1.43, and the prevailing forward rate is $1.38, they might buy euros 30 days forward at $1.38 and sell them when received (in 30 days) at the spot rate existing then. If their forecast is correct, they will earn $.05 ($1.43-$1.38) per euro. If a large number of speculators implement this strategy, the substantial forward purchase of euros will cause the forward rate to increase until the speculative demand stops. It is more likely that this speculative demand will

terminate when the forward rate reaches $1.43 and no profits can be made. This example shows that the forward rate should move toward the market's expectation of the future spot rate. Because of skepticism surrounding forecasting techniques, some people or organizations may prefer to use a combination called mixed forecasting. It uses various forecast techniques for a particular currency value, assigning each technique a particular weight in such a way that the weights totaled 100%, with techniques thought to be more reliable assigned higher weights. This is a weighted average of the various forecast developed.

In light of uncertainty surrounding different approaches for the study of exchange rates, attempt will continue to be made in the future to test various techniques for more accuracy in predicting the exchange rates and challenge various track records.

The objective of this paper is to investigate a different and less frequent technique for the study of exchange rates. Following in the footsteps of T.L. Saaty (1977) and M.D. Troutt and H.H. Elsaid (1996), a test of the eigenvector scaling technique was conducted for selected currencies to establish a central tendency relationship among currencies in an attempt to validate some potential application of *priority theory* to the model. Priority theory stems from Saaty's work known as the analytic hierarchy process (AHP).

VALUE RATIO MATRIX

The eigenvector system uses the concept of pairwise comparison matrix of ratios similar to the illustration example that follows. Consider an economy consisting of three industries: an agricultural industry (*AI*), a service industry (*SI*) and a manufacturing industry (*MI*). The country may wish to assess the importance of each sector based on its weight vis-à-vis each other.

Table 1. Value Ratio Table for Three Industries in a Given Economy

	AI	*SI*	*MI*
AI	1	2	1/3
SI	1/2	1	9
MI	3	1/9	1

A matrix estimate of the form W*ij* = [W*ij*], where W*ij* = the country's estimate of the ratios of importance of each sector with respect to weight. The data appears as follows:

$$W_{ij} = \begin{matrix} 1 & 2 & 1/3 \\ 1/2 & 1 & 9 \\ 3 & 1/9 & 1 \end{matrix} \quad (1)$$

The spreadsheet above represents an array of numbers. Each number's position is critical and it is important that we know the significance of each location in the array. First, the diagonal entries must logically be equal to one and the below diagonal entries should equal the reciprocals of the above diagonals entries. In reference to the matrix above, this economy recognizes that the agricultural industry (*AI*) is only 1/3 as important as the manufacturing industry (*MI*) based on their respective weights. The fundamental question now is to determine what relative ratios r_1, r_2, and r_3 are a good measure of central tendency and a compromise to the data. The solution might be found by investigating a problem formulated as:

$$W\mathbf{q} = \lambda\mathbf{q} \tag{2}$$

Where W is a known square matrix of order *n x n*, **q** is an unknown n-element column vector, and **λ** is an unknown scalar. The eigenvalue problem arises, in contrast to a system of *n* linear equations formulated as W**x =b** where the only unknown vector is **x.** We now have to solve for two unknowns **λ** and **q**. In the eigenvalue problem formulated in equation (2), **q** is an *n* x 1 unknown vector known as the eigenvector, or characteristic vector, or latent vector; **λ** is an unknown scalar known as the eigenvalue, or characteristic root, or latent root (Hoy, Livernois, McKenna, Rees, and Stengos, 1996).

$$(W - \lambda I)\,\mathbf{q} = 0 \tag{3}$$

Equation (3) is derived from (2) and the process is provided in the appendix. I is the identity matrix. For equation (3) to hold, when (W- **λ**I) is non singular, we require that **q** be the zero vector. For simplification, a solution $\mathbf{q} \neq 0$, we need (W- **λ**I) to be singular. The singularity of (W- **λ**I) will imply that:

$$(W - \lambda I) = 0 \tag{4}$$

Equation (4), the characteristic polynomial for matrix W is of degree *n* in **λ**, where *n* is the order of the matrix W with its *n* roots being given by **λ**1**,….,** **λ**n. Each **λi,** i=1,…., *n* can then be substituted into equation (3) to obtain the corresponding eigenvector **qi**. The derived characteristic equation for matrix W (Appendix) is a quadratic equation whose roots are the values of **λ, λ**1**,** and **λ**2. The method in this study uses the solution of the eigenvector equation:

$$W\mathbf{q} = \lambda_{max}\,\mathbf{q} \tag{5}$$

Where λ_{max} is the principal eigenvalue of W

APPLYING EXCHANGE RATE DATA TO A VALUE RATIO MATRIX

A matrix of pairwise ratios of worth for selected currencies is applied in the present study. Previous studies (Loganathan and Sherali, 1987, Troutt and Tadisina, 1991) proposed the eigenvalue method described earlier for obtaining consistent trade-off ratios in interactive optimization. The consensus of the market is being sought as the columns of matrix W are set as individual comparative scalings to each of the possible bases j=1 to n (i.e., dollar, euro, yen, etc…). The individual comparative scalings are used as inputs for a solution corresponding to λ_{max} that provides an optimum overall ranking. Matrix Wij is an approximation of the ratio ri/rj. This is a consensus based correct ratio based on an inquiry in the various major markets that yields an accurate estimate.

Let currency exchange rate data be organized initially into the form of the matrix A.

Table 2. Matrix Table of Most Recent Cross-Rates of Currencies *

	USD	EUR	JPY	GBP	CHF	CAD	MXN	AUD	INR	ZAR	NZD	SWK	THB
USD	1.000	1.357	0.008	2.002	0.891	0.891	0.091	0.832	.024	0.141	0.745	0.147	0.030
EUR	0.735	1.000	0.006	1.474	0.609	0.656	0.067	0.613	0.017	0.104	0..549	0.108	0.022
JPY	118.838	160.81	1.000	237.29	98.108	105.56	10.798	98.77	2.859	16.747	88.44	17.50	3.638
GBP	0.499	0.678	0.004	1.000	0.413	0.445	0.045	0.416	0.012	0.070	0.372	0.073	0.015
CHF	1.207	1.641	0.102	2.420	1.000	1.076	0.110	1.005	0.029	0170	0.901	0.178	0.031
CAD	1.123	1.524	0.009	2.246	0.928	1.000	0.102	0.934	0.026	0.158	0.836	0.165	0.034
MXN	10.968	14.894	0.092	21.965	9.077	9.779	1.000	9.134	0.264	1.547	8.180	1.620	0.338
AUD	1.19771	1.628	0.010	2.401	0.994	1.070	0.109	1.000	0.028	0.169	0.895	0.177	0.037
INR	41.6000	56.288	0.349	83.033	34.318	36.950	3.778	34.65	1.000	5.871	31.033	6.147	1.283
ZAR	7.04130	9.601	0.597	14.185	5.845	6.309	0.645	5.885	0.170	1.000	5.268	1.047	0.217
NZD	1.34034	1.821	0.011	2.684	1.110	1.195	0.122	1.116	0.032	0.189	1.000	0.198	0.041
SWK	6.76240	9.188	0.057	13.560	5.602	6.031	0.616	5.635	0.162	0.955	5.047	1.000	0.208
THB	32.650	44.056	0.274	65.215	26.953	28.909	2..969	27.12	0.779	4.591	24.197	4.811	1.000

*USD=US dollar, EUR=European euro, JPY=Japanese yen, GBP=Great Britain pound, CHF=Switzerland franc, CAD=Canadian dollar, MXN=Mexican pesos, AUD=Australian dollar, INR=Indian rupee, ZAR=South African rand, NZD=New Zeeland dollar, SWK=Sweden kronor, THB=Thailand baht

The values in table 2 are recent actual quotations of the *Universal Currency Converter*. A 13 x 13 matrix A_{ij} can be formed where:

A_{ij} = number of units of currency i equivalent to 1 unit of currency j

In order to validate the eigenvector scaling method, we use Saaty's and later Troutt et al's W**q** = λ_{max}**q** approach, where matrix Wij is an approximation of the ratio ri/r_j (ratio of currencies worth),

an assumed correct ratio and consensus based on an inquiry in the currency market that yields more or less a precise estimate.

W*ij*= currency *i* worth/currency *j* worth.

The transpose of matrix W*ij*=A^T has the desired ratio of currencies worth construal. For example, $W_{10,6}$=0.157 indicates that 1 South African rand is estimated to be worth 0.157 Canadian dollars. This simply implies that 0.157 is an estimate worth of a rand in Canadian dollars. The same way, $W_{7,3}$=10.798 indicates that 1 Mexican peso is estimated to be worth 10.798 Japanese yens. This also simply implies that 10.798 is an estimate worth of a peso in Japanese yens. An iterative computational procedure based on the reciprocal ratio matrix of A is used to obtain a solution *q** of the eigenvector equation. This can only be accomplished if the roots of the characteristic equation (**λs**) are determined first. Once we obtain the eigenvalues of matrix A as solutions to the characteristic equation, we proceed to obtain the corresponding eigenvectors. The solution q* can be used to form consensus estimates whereby the reciprocal of the ratio of currencies worth (r_{i*}/r_{j*}) becomes the exchange rate. A central tendency set of rates that provide a rational forecast in the short-run is now possible to derive. Tables in the appendix shows A and A* matrices for all the currencies implicated in this study for an arbitrary six days close to the date of April 16th, 2007. Differences can be seen between the actual exchange rates and the corresponding imputed consensus data. When a comparison was made in a paired currency match up (Appendix Table 20) there was evidence of leading indicator relationship in general. The direction of the difference between A* and A is consistent at best with the change in A in the next period over period *t* in spite of mixed results at times. In this case A* series of exchange rates were induced in order to test evidence of a leading indicator relationship. It was determined that in most cases the difference between A* and A follows the same pattern change in A in the next period. When $A_t * < A_t$ ($A_t * > A_t$), then the following period it could be noted that $A_{t+1} < A_t$ ($A_{t+1} > A_t$).

CONCLUSION

An eigenvector scaling technique was conducted for selected currencies to establish a central tendency relationship among currencies. It was concluded that the method applicability to aggregating global currency exchange rate information in defining trends was suitable for short-term forecasting. Like any other forecasting technique, the usefulness of the eigenvector scaling technique is based on its practicality in producing forecasts that negate or dominate the random walk for a short-term period. The real exchange rate volatility (in the post Bretton Woods 'regime) is the result of shocks such as preference shocks and productivity as both can change the real exchange rate. The currency exchange rate system is traditionally seeking to get back to equilibrium after random shocks. There is ample evidence in the present study to support the proposition that standard

exchange rates models have clear forecastibility at short horizons. There are other shifting factors that play an important role in determining the likely future exchange rates. These have an effect on the characteristic vector and the characteristic root of the present model. The bandwagon effects which are difficult to predict should not be ignored (Allen and Taylor, 1990, and T. Ito, 1990). The exchange rate itself is also influenced by the markets for exchange rate. It should also be noted that different functional forms or estimating techniques may produce different results. While caution must be exercised in applying and interpreting the result, this information is useful in predicting the directions of movements of currency value ratios.

REFERENCES

Allen, H.L. and M.P. Taylor. "Charts, Noise, and Fundamentals Foreign Exchange Markets." *Economic Journal* 100 (1990), pp 49 –59.

Cumby, R.E. and M. Obstfeld. "A Note on Exchange Rate Expectations- and Nominal Interest Differentials: A Test of the Fisher Hypothesis." *Journal of Finance* (June 1981), pp 697 703.

Dooley, Michael P. and Shafer, Jeffrey R. "Analysis of Short-run Exchange Rate Behaviour: Mar.1973 to 1981, in "*Exchange rate and trade instability*. Eds.: David Bingham and Teizo Taya. Cambridge, MA: Ballinger, 1983, pp. 43-69.

Goodman, Stephen H., "Foreign Exchange Rate Forecasting Techniques: Implications for Business and Policy," *Journal of Finance* (May 1979), pp 417-427.

Hoy, M., Livernois, J., McKenna, C., Rees, and R., Stengos, T. "*Mathematics for Economics.*" Addison-Wesley Publishers (1996).

Krugman, Paul and Obstfeld, Maurice "*International Economics: Theory and Policy*" Harper Collins, New York, 1994.

Levich, Richard M. Thomas, Lee R. "The Significance of Technical Trading –Rule Profits in the Foreign Exchange Market: A Bootstrap Approach," *Journal of International Money Finance*, Oct. 1993, 12(5), pp. 451-74.

Loganathan G.V. and Sherali, A. "A Convergent Interactive Cutting-plane Algorithm for Multiobjective Optimization" *Operations Research*., 35, 3 (1987), pp365-377.

Logue, Dennis E. and Sweeney Richard M., "White Noise in Imperfect Markets: The Case of the Franc/Dollar Exchange Rate" *Journal of Finance* May 1978, pp. 761-768.

Madura, Jeff. *International Financial Management.* 4th Edition, West Publishing Company, St., MN. 1995.

Musa, Michael. "The Role of Intervention." *Group of Thirty Occasional Papers* No. 6, New York, 1981.

Poole, Williams. "Speculative Prices as Random Walks: An Analysis of Ten Times Series of Flexible Exchange Rates," *Southern Economic Journal*, April 1967, 33(2), pp.468-78.

Saaty, T.L. "A Scaling Method for Priorities in Hierarchical Structures," *Journal of Math Psychology*, 15, 3 (1977) pp. 234-281.

Troutt M.D. and Elsaid H.H. "The Potential value of Saaty' Eigenvector Scaling Method for Short-Term Forecasting of Currency Exchange Rates." *Society for Industrial and Applied Mathematics* Vol. 38, No.4, pp 650-654, 1996.

Troutt M.D. and Tadisina S.K. "Corrigendum and Further Results: Ranks Reversal and the Dependence on the Underlying MAV Function", *OMEGA*, 18, 6 (1991), pp 655-656.

Universal Currency Converter, *http://www.xe.com/ucc/*

APPENDIX 1

METHODOLGY USED TO DETERMINE THE RATIO OF WORTH OF CURRENCIES WHOSE RECIPROCAL (OR ALSO TRANSPOSE) BECOMES AN EXCHANGE RATE

Deriving the characteristic vector **q** and the characteristic root m or **λ** in the paper (Hoy, Livernois, McKenna, Rees, and Stengos, 1996), let us assume a special case of equation (2) where W is a *2x2* matrix (a pairwise match up of two currencies) and **q** an *nx1* unknown vector known as the *eigenvector* or characteristic vector, and m (or **λ**) an unknown scalar known as the eigenvalue or characteristic root.

$$\begin{vmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{vmatrix} \quad \begin{vmatrix} q_1 \\ q_2 \end{vmatrix} = m \begin{vmatrix} q_1 \\ q_2 \end{vmatrix}$$

This can be written as a system of two equations

$$a11q_1 + a12q_2 = mq_1$$
$$a12 + a22q_2 = mq_2$$

or

$$(a11 - m)q_1 + a12q_2 = 0$$
$$a21q_1 + (a22 - m)q_2 = 0$$

In matrix form, these equations become (A-mI) **q**=0 which is equation (3) in the paper and derived from (2). I is the identity matrix. For equation (3) to hold, when (W- **λ**I) is non singular, we require that **q** be the zero vector. For simplification, a solution **q** ≠ 0, we need (W- **λ**I) to be singular. The singularity of (W- **λ**I) will imply that (W- **λ**I) = 0. This characteristic polynomial for matrix W is of degree n in **λ**, where n is the order of the matrix W with its n roots being given by **λ**1**,…., λ**n. Each **λi,** i=1,…., n can then be substituted into equation (3) to obtain the corresponding eigenvector **qi**. The derived characteristic equation for matrix W (Appendix) is a quadratic equation whose roots are the values of **λ, λ**1**,** and **λ**2. The method in this study used the solution of the eigenvector equation.

We can derive the characteristic root by looking at

$$\begin{vmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{vmatrix} - \begin{vmatrix} m & 0 \\ 0 & m \end{vmatrix} \quad 0$$

$$\begin{vmatrix} (a_{11} - m) & a_{22}\, a_{12} \\ a_{21} & (a_{22} - m) \end{vmatrix} = (a_{11} - m)(a_{22} - m) - a_{12}\, a_{21}$$

$$= a_{11}\, a_{12} - m\, a_{22} - m\, a_{11} + m^2 - a_{12}\, a_{21}$$

$$= m^2 - (a_{11} - a_{12})m + (a_{11}\, a_{12} - a_{12}\, a_{21}) \qquad 0$$

We end up with a quadratic equation of the form

$$a\, m^2 + b\, m + c$$

The roots of the above quadratic equation are the values of m1 (**λ1**) and m2 (**λ2**) that satisfies the quadratic equation.

$$m_1 = \frac{-b + \sqrt{(b^2 - 4ac}}{2a}$$

$$m_2 = \frac{-b - \sqrt{(b^2 - 4ac}}{2a}$$

In this case, $a = 1$, $b = -(a_{11}+a_{22})$, and $c = a_{11}\, a_{22} - a_{12}\, a_{21}$

$$m_1 = \frac{1}{2}((a11 + a22) + \sqrt{(a11 + a22)^2 - 4(a11a22) - a12 + a21)})$$

$$m_2 = \frac{1}{2}((a11 + a22) - \sqrt{(a11 + a22)^2 - 4(a11a22) - a12 + a21)})$$

Because matrix W is symmetric and *a12 =a21*, the roots become

$$m_1 = \frac{1}{2}((a11 + a22) + \sqrt{(a11 - a22)^2 + 4a12^2)})$$

$$m_2 = \frac{1}{2}((a11 + a22) - \sqrt{(a11 - a22)^2 + 4a12^2)})$$

For two currencies, the USD and the EUR

$$\text{Wij} = \begin{vmatrix} 1.357 & 1 \\ 1 & 0.735 \end{vmatrix}$$

The Solution is

$$\text{W- mI} = \begin{vmatrix} 1.357 - \text{m} & 1 \\ 1 & 0.735 - \text{m} \end{vmatrix}$$

$$= (1.357\text{-}m)\ (0.735\text{-}m)\text{-}1$$

$$= 0.997\text{-}1.357m\text{-}0.735m + m^2\text{-}1$$

$$= m^2\text{-}2.087m\text{-}0.003$$

The roots are obtained solving the quadratic equation above that yields m_1 and m_2. In this case, $m_1 = 0.025$ and $m_2 = -2.085$. The associated eigenvectors can be found by substituting each eigenvalue into the system of equations below

$$(a_{11} - m)q_1 + a_{12}q_2 = 0$$
$$a_{21}q_1 + (a_{22} - m)q_2 = 0$$

Then we obtain

$$(1.357\text{-}m)\, q_1 + (1)\, q_2 = 0$$
$$(1)\, q_1 + (0.735\text{-}m)\, q_2 = 0$$

Solving for q_1 let's consider first when m=0.0025

$$(1.357\text{-}0.0025)\, q_1 + (1)\, q_2 = 0$$
$$(1)\, q_1 + (0.735\text{-}0.0025)\, q_2 = 0$$
$$(1.3545)\, q_1 + q_2 = 0$$
$$q_1 + (0.7325)\, q_2 = 0$$

Which has a solution $q_1 = -0.7325\, q_2$

The eigenvector associated with m= 0.0025 is

$$\begin{vmatrix} -0.735 \\ 1 \end{vmatrix}$$

Then solving for q_1 when m= -2.085

$$(1.357+2.085)\, q_1 + (1)\, q_2 = 0$$
$$(1)\, q_1 + (0.735+2.085)\, q_2 = 0$$
$$(3.442)\, q_1 + q_2 = 0$$
$$q_1 + (2.82)\, q_2 = 0$$

Which has a solution $q_1 = -2.82 q_2$

The eigenvector associated with m= 0.0025 is

$$\begin{vmatrix} -2.82 \\ 1 \end{vmatrix}$$

The matrix of eigenvectors is now

$$W = \begin{vmatrix} 1 & -0.7325 \\ -2.82 & 1 \end{vmatrix}$$

The inverse of the matrix above is

$$W1 = \begin{vmatrix} 0.326 & 0.239 \\ 0.919 & 0.326 \end{vmatrix}$$

A diagonalized system of equations involving a matrix of weights as unknowns is created in order to solve for the steady-state values of r_1 and r_2.

Appendix 2: Summary Tables

Period t	Date	A	A*	At-At-1	A*t-At-1	H/NH
1	01/04/07	119.29	118.99	2.380	1.58	H
2	01/22/07	121.57	120.57	-0.370	-1.23	H
3	02/08/07	121.20	119.34	-2.520	-0.53	H
4	02/27/07	118.68	118.81	-0.520	0.090	NH
5	03/09/07	118.16	118.90	1.690	0.33	H
6	04/16/07	119.85	119.23	n/a	n/a	n/a

JPY/USD: PACIFIC Exchange Rate Service			
Jul Day	YYYY/MM/DD	Wdy	JPY/USD
2454105	2007/01/04	Thu	119.29
2454123	2007/01/22	Mon	121.57
2454140	2007/02/08	Thu	121.20
2454159	2007/02/27	Tue	118.68
2454169	2007/03/09	Fri	118.16
2454207	2007/04/16	Mon	119.85

Period t	Date	A	A*	At-At-1	A*t-At-1	H/NH
1	01/04/07	0.76374	0.7325	0.805	0.0512	H
2	01/22/07	0.77179	0.7837	-0.461	-0.0125	H
3	02/08/07	0.76718	0.7712	-0.121	-0.0089	H
4	02/27/07	0.75504	0.7623	0.726	0.0148	H
5	03/09/07	0.76230	0.7801	-0.242	-0.0105	H
6	04/16/07	0.73806	0.7696	n/a	n/a	n/a

EUR/USD: PACIFIC Exchange Rate Service			
Jul Day	YYYY/MM/DD	Wdy	EUR/USD
2454105	2007/01/04	Thu	0.76374
2454123	2007/01/22	Mon	0.77179
2454140	2007/02/08	Thu	0.76718
2454159	2007/02/27	Tue	0.75504
2454169	2007/03/09	Fri	0.76230
2454207	2007/04/16	Mon	0.73806

Period t	Date	A	A*	At-At-1	A*t-At-1	H/NH
1	01/04/07	0.51436	0.51376	-0.857	-.0087	H
2	01/22/07	0.50579	0.5050	0.479	0.161	H
3	02/08/07	0.51058	0.5211	-0.195	-.0144	H
4	02/27/07	0.50863	0.50663	0.903	0.0112	H
5	03/09/07	0.51766	0.51786	-0.153	-0.013	H
6	04/16/07	0.50238	0.50446	n/a	n/a	n/a

GBP/USD: PACIFIC Exchange Rate Service			
Jul Day	YYYY/MM/DD	Wdy	GBP/USD
2454105	2007/01/04	Thu	0.51436
2454123	2007/01/22	Mon	0.50579
2454140	2007/02/08	Thu	0.51058
2454159	2007/02/27	Tue	0.50863
2454169	2007/03/09	Fri	0.51766
2454207	2007/04/16	Mon	0.50238

Period t	Date	A	A*	At-At-1	A*t-At-1	H/NH
1	01/04/07	1.2725	1.2865	-0.005	-0.012	H
2	01/22/07	1.2670	1.2744	0.0132	0.0067	H
3	02/08/07	1.2802	1.2811	-0.019	-0.0178	H
4	02/27/07	1.2607	1.2633	0.0204	0.0101	H
5	03/09/07	1.2811	1.2734	-0.080	0.1976	H
6	04/16/07	1.2010	1.4710	n/a	n/a	n/a

AUD/USD: PACIFIC Exchange Rate Service			
Jul Day	YYYY/MM/DD	Wdy	AUD/USD
2454105	2007/01/04	Thu	1.2725
2454123	2007/01/22	Mon	1.2670
2454140	2007/02/08	Thu	1.2802
2454159	2007/02/27	Tue	1.2607
2454169	2007/03/09	Fri	1.2811
2454207	2007/04/16	Mon	1.2010

Period t	Date	A	A*	At-At-1	A*t-At-1	H/NH
1	01/04/07	1.1767	1.1564	-0.0008	-0.4182	H
2	01/22/07	1.1759	1.1458	0.0094	0.6372	H
3	02/08/07	1.1853	1.1783	-0.0214	-0.0018	H
4	02/27/07	1.1639	1.1765	0.0073	0.0027	H
5	03/09/07	1.1712	1.1792	-0.0402	-0.0303	H
6	04/16/07	1.1310	1.1489	n/a	n/a	n/a

CAD/USD: PACIFIC Exchange Rate Service			
Jul Day	YYYY/MM/DD	Wdy	CAD/USD
2454105	2007/01/04	Thu	1.1767
2454123	2007/01/22	Mon	1.1759
2454140	2007/02/08	Thu	1.1853
2454159	2007/02/27	Tue	1.1639
2454169	2007/03/09	Fri	1.1712
2454207	2007/04/16	Mon	1.1310

Period t	Date	A	A*	At-At-1	A*t-At-1	H/NH
1	01/04/07	10.865	10.877	0.430	0.047	H
2	01/22/07	10.908	10.924	0.57	0.053	H
3	02/08/07	10.965	10.977	0.183	0.783	H
4	02/27/07	11.148	11.760	-0.25	-0.404	H
5	03/09/07	11.123	11.356	-0.186	-0.400	H
6	04/16/07	10.937	10.956	n/a	n/a	n/a

MXN/USD: PACIFIC Exchange Rate Service			
Jul.Day	YYYY/MM/DD	Wdy	MXN/USD
2454105	2007/01/04	Thu	1.2725
2454123	2007/01/22	Mon	1.2670
2454140	2007/02/08	Thu	1.2802
2454159	2007/02/27	Tue	1.2607
2454169	2007/03/09	Fri	1.2811
2454207	2007/04/16	Mon	1.2010

Period t	Date	A	A*	At-At-1	A*t-At-1	H/NH
1	01/04/07	1.4329	1.4456	-0.0031	0.0011	N/H
2	01/22/07	1.4298	1.4467	0.0272	0.003	H
3	02/08/07	1.4570	1.4497	-0.0381	-0.0267	H
4	02/27/07	1.4189	1.4230	0.0274	0.0424	H
5	03/09/07	1.4463	1.4654	-0.013	-0.0312	H
6	04/16/07	1.4333	1.4342	n/a	n/a	n/a

NZD/USD: PACIFIC Exchange Rate Service			
Jul.Day	YYYY/MM/DD	Wdy	NZD/USD
2454105	2007/01/04	Thu	1.2725
2454123	2007/01/22	Mon	1.2670
2454140	2007/02/08	Thu	1.2802
2454159	2007/02/27	Tue	1.2607
2454169	2007/03/09	Fri	1.2811
2454207	2007/04/16	Mon	1.2010

Period t	Date	A	A*	At-At-1	A*t-At-1	H/NH
1	01/04/07	44.170	44.257	-0.046	-0.2710	H
2	01/22/07	44.124	43.986	-0.126	-0.263	H
3	02/08/07	43.998	43.723	0.072	0.385	H
4	02/27/07	44.070	44.108	0.010	0.237	H
5	03/09/07	44.080	44.345	-1.641	0.353	N/H
6	04/16/07	42.439	44.698	n/a	n/a	n/a

INR/USD: PACIFIC Exchange Rate Service			
Jul.Day	YYYY/MM/DD	Wdy	INR/USD
2454105	2007/01/04	Thu	1.2725
2454123	2007/01/22	Mon	1.2670
2454140	2007/02/08	Thu	1.2802
2454159	2007/02/27	Tue	1.2607
2454169	2007/03/09	Fri	1.2811
2454207	2007/04/16	Mon	1.2010

Period t	Date	A	A*	At-At-1	A*t-At-1	H/NH
1	01/04/07	7.0800	7.1235	0.0166	0.1075	H
2	01/22/07	7.0966	7.2310	0.0783	0.0145	H
3	02/08/07	7.1749	7.2455	0.0364	0.0443	H
4	02/27/07	7.2113	7.2898	0.1087	0.0467	H
5	03/09/07	7.3200	7.3365	-0.2202	-0.202	H
6	04/16/07	7.0998	7.1345	n/a	n/a	n/a

ZAR/USD: PACIFIC Exchange Rate Service			
Jul.Day	YYYY/MM/DD	Wdy	ZAR/USD
2454105	2007/01/04	Thu	1.2725
2454123	2007/01/22	Mon	1.2670
2454140	2007/02/08	Thu	1.2802
2454159	2007/02/27	Tue	1.2607
2454169	2007/03/09	Fri	1.2811
2454207	2007/04/16	Mon	1.2010

Period t	Date	A	A*	At-At-1	A*t-At-1	H/NH
1	01/04/07	1.2315	1.245	0.0169	0.0137	H
2	01/22/07	1.2484	1.2587	-0.0011	-0.342	H
3	02/08/07	1.2473	1.2245	-0.0266	-0.0145	H
4	02/27/07	1.2207	1.212	0.0118	0.033	H
5	03/09/07	1.2325	1.245	-0.0191	-0.02	H
6	04/16/07	1.2134	1.225	n/a	n/a	n/a

CHF/USD: PACIFIC Exchange Rate Service			
Jul.Day	YYYY/MM/DD	Wdy	CHF/USD
2454105	2007/01/04	Thu	1.2725
2454123	2007/01/22	Mon	1.2670
2454140	2007/02/08	Thu	1.2802
2454159	2007/02/27	Tue	1.2607
2454169	2007/03/09	Fri	1.2811
2454207	2007/04/16	Mon	1.2010

Period t	Date	A	A*	At-At-1	A*t-At-1	H/NH
1	01/04/07	6.9340	6.8675	0.1073	0.3058	H
2	01/22/07	7.0413	7.1733	-0.0689	0.0743	N/H
3	02/08/07	6.9724	7.2476	0.0012	-0.256	N/H
4	02/27/07	6.9736	7.012	0.1246	0.1178	H
5	03/09/07	7.0982	7.1298	-0.2972	-0.9875	H
6	04/16/07	6.8010	6.1423	n/a	n/a	n/a

SEK/USD: PACIFIC Exchange Rate Service			
Jul.Day	YYYY/MM/DD	Wdy	SEK/USD
2454105	2007/01/04	Thu	1.2725
2454123	2007/01/22	Mon	1.2670
2454140	2007/02/08	Thu	1.2802
2454159	2007/02/27	Tue	1.2607
2454169	2007/03/09	Fri	1.2811
2454207	2007/04/16	Mon	1.2010

Period t	Date	A	A*	At-At-1	A*t-At-1	H/NH*
1	01/04/07	35.799	35.667	-0.645	0.122	N/H
2	01/22/07	35.154	35.789	-0.877	0.178	N/H
3	02/08/07	34.277	35.967	-0.105	-0.105	H
4	02/27/07	34.172	34.234	1.580	1.536	H
5	03/09/07	35.752	35.770	-0.299	-0.369	H
6	04/16/07	35.453	35.401	n/a	n/a	n/a

*H=holds
NH=Does not hold

THB/USD: PACIFIC Exchange Rate Service			
Jul.Day	YYYY/MM/DD	Wdy	THB/USD
2454105	2007/01/04	Thu	1.2725
2454123	2007/01/22	Mon	1.2670
2454140	2007/02/08	Thu	1.2802
2454159	2007/02/27	Tue	1.2607
2454169	2007/03/09	Fri	1.2811
2454207	2007/04/16	Mon	1.2010

www.alliedacademies.org

www.alliedacademies.org