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# JOURNAL OF INTERNATIONAL BUSINESS RESEARCH

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# POWER DISTANCE AND UNCERTAINTY AVOIDANCE: A CROSS-NATIONAL EXAMINATION OF THEIR IMPACT ON CONFLICT MANAGEMENT MODES

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## ABSTRACT

*The aim of this research study was to examine two of Geert Hofstede's cultural dimensions (Power Distance and Uncertainty Avoidance) in three countries – the US, Nigeria and India. This research also aimed at examining the impact of these two cultural dimensions on five conflict management modes – avoidance, accommodation, compromise, competition and collaboration – using Kilmann and Thomas's (1977) MODE instrument.*

*The study found that respondents from the three nations differed significantly in terms of their cultural value dimensions of power distance and uncertainty avoidance. Multivariate analysis indicated that the three groups of respondents also differed significantly on their preference for two conflict management modes – compromising and avoiding. The implications of these findings are discussed within the realm of management and organizations.*

## INTRODUCTION

Recent trends such as the globalization of business, increased diversity in the workforce, and increasing international alliances and mergers, highlight the need to examine conflict within an international context (Adler, 1983; Hofstede 1997; Maddox, 1993). Researchers caution against the unquestioning adoption, dissemination, and application of Western management theories through out the world (Adler, 1997; Hofstede, 1998, 2001). Consequently, investigators are increasingly examining organizational phenomena such as conflict management within an international context either theoretically (Kozan, 1997; Purohit & Parasuraman, 1993) or empirically (Anakwe, Purohit & Simmers, 1999; Augsburger, 1992; Kozan, 1989; McKenna, 1995; Tinsley & Brett, 1997; Tse, Francis, & Walls, 1994). Existing research suggests that cultural differences exist in the interpretation of conflict, its management, and the conflict resolution strategies adopted by individuals from different countries (Anakwe et al., 1999; Epie, 2002; Gire & Carment, 2001; Xie, Song & Stringfellow, 1998).

The present investigation focuses on the preference for conflict management modes (Thomas 1992), and examines whether Hofstede's (1980) cultural value dimensions of power distance and uncertainty avoidance influence the preference for conflict management modes in respondents from three countries - Nigeria, India, and the U.S. In the following sections we highlight the importance of examining conflict management as a construct enmeshed in a society's cultural values. We also highlight the importance of examining conflict management in a cross-national context encompassing countries like Nigeria and India in addition to the U.S.

## CONFLICT MANAGEMENT

According to van de Vliert and Prein (1989) conflict was initially conceptualized as a uni-dimensional construct with cooperation and competition designated as the two ends of a continuum. Blake and Mouton (1970) modified this uni-dimensional approach and identified two basic underlying dimensions of conflict: (1) cooperation -the extent to which a person attempts to satisfy the concerns of the other party in the conflict situation; and (2) assertiveness - the extent to which one attempts to satisfy one's own concerns. Rahim (1986) labeled these dimensions as 'concern for others' (cooperation) and 'concern for self' (assertiveness).

In this study we adopt Thomas's (1992) stance and conceptualize and operationalize conflict as a bi-dimensional construct representing the strategic intentions of parties to a conflict. Phrased in terms of strategic intentions, the underlying dimensions of assertion and cooperation represent attempts at satisfying one's own and/or satisfying others' concerns in varying conflict situations. Individuals indicating a preference for assertive conflict management modes are likely to be focusing more on satisfying their own needs and goals compared to individuals preferring cooperative conflict management modes. The latter would demonstrate a greater concern for satisfying others' needs and goals in conflict situations.

Varying combinations of these two dimensions result in five conflict handling modes, namely, collaborating, competing, compromising, accommodating, and avoiding. Collaborating (problem-solving) is a combination of both, highly assertive and highly cooperative behaviors with individuals using joint decision making through open discussion channels to resolve problems. Since this mode is based on a win-win approach, it works best when people feel free to communicate and share ideas (Robbins, 2003). Competing (forcing) involves highly assertive and non-cooperative behaviors. Individuals preferring this mode are likely to view their own personal goals as being more important (Hamilton & Parker, 2002) regardless of the impact on others. This win-lose orientation involves the conflicting parties' utilizing formal authority and their power bases to gain a competitive edge (Robbins, 2003). Compromising (scarifying) involves intermediate levels of both assertiveness and cooperation. The distinguishing feature of compromising is that both parties involved in the conflict give up something (Robbins, 2003). This style is likely to work best when conflicting parties share equal power and are committed to mutually exclusive goals (Thomas,

1992). Accommodating (smoothing) is non-assertive, highly cooperative behavior that focuses on appeasing others. Individuals preferring this mode may be willing to place others' needs over their own to maintain a harmonious relationship and receive personal acceptance (Hamilton & Parker, 2002). Avoiding (withdrawing) involves behaviors that are low on both assertiveness and cooperation. Such behaviors focus on neutrality and are based on the view that conflict is worthless and negative and is to be avoided (Hamilton & Parker, 2002).

The two orthogonal dimensions framing the five conflict management styles have dominated research on conflict (Wall & Callister, 1995). Research using this framework has examined gender and status differences in conflict management (Rahim, 1983; Kilmann & Thomas, 1977), the effect of reciprocal conflict management styles (Cosier and Ruble, 1981), and differential outcomes of conflict provoked (Renwick, 1975). Despite the vast body of research on conflict, Wall and Callister (1995) emphasize that it is a dynamic body of research where cause and effects are often interchangeable, and conflict issues vary all the time.

## CULTURAL VALUES

Scholars on conflict management assert that culture has a strong influence on conflict management modes adopted or preferred by individuals (Augsburger, 1992; Rahim, 1992; Thomas, 1992; Wall & Callister, 1995). The definitions of the concept of culture have remained relatively unchanged (Singh 1990) and relate to shared norms, knowledge, beliefs, morals and customs among collectivities. Researchers today examine culture in two ways: the ideational view focusing on norms, values, and beliefs; and the behavioral view focusing on expressions, symbols and the enactment of culture, with most organizational studies examining the ideational view (Singh, 1990).

In this article we attempt to address this gap by examining the preference for conflict management modes as an expressive symbol of culture. Examinations of culture combining the ideational and the behavioral views are likely to yield a richer understanding of culture's role in organizations. Applying this combined view to the specific context of conflict management and culture appears inherently intuitive. For example, Rabie, (1994) states that culture defines the values and interests at the core of any conflict situation, which in turn shapes peoples' perception of themselves and others (the ideational view), as well as the style by which they handle conflict (the behavioral view).

We opted to use Hofstede's (1980) dimensions of cultural values to examine culture's influence (the ideational view) as his research provides a generalizable and quantifiable framework for examining national culture. Hofstede's (1980) framework of national culture is one of the most popular and frequently cited with five dimensions (four dimensions prior to 1985) of cultural values. A careful examination of this framework indicates that his value dimensions concentrate on what Singh (1990) describes as the ideational view – values, norms and beliefs, but not on the behavioral view - expressive symbols.

Of Hofstede's five dimensions of national culture, we examined the role of power distance and uncertainty avoidance as by their definition and nature these two are likely to play a significant part in conflict situations. Hofstede (2001) explains power distance as the way in which societies deal with human inequalities in terms of material and non-material possessions. Prestige, wealth, and power vary in their importance and how people respond to them in different societies. Uncertainty avoidance refers to the mechanisms societies develop to deal with the uncertainties of daily existence and the unpredictability of the future. Some societies respond by having many rules and procedures emphasizing stability whereas other societies are less concerned about stability.

We did not include individualism - the value dealing with the relationship of individuals with groups or the cohesiveness of society - in this research as this dimension has been studied in ample detail (for a detailed meta-analysis please see Oyserman, Coon & Kemmelmeier, 2002). We also decided to exclude masculinity-femininity from our study as this dimension is still vague as evidenced by Hofstede's book titled "Masculinity and Femininity: The Taboo Dimension of National Cultures." Hofstede (1998) states that the Masculinity/Femininity dimension is the only one that consistently produces different scores for male and female respondents. Given that we had a small percentage of women respondents in one country (discussed later in the paper) we were aware that our sample may not be comparable on the Masculinity/Femininity values across the countries we examined. In addition, these two dimensions are derived from the same set of items and emerge from a factor analysis of the items (Hofstede, 2001).

Hofstede's fifth dimension of national culture, independent of the four identified in the original IBM studies, was derived from a values inventory suggested by Asian researchers and is reminiscent of the teachings of Confucius (Hofstede, 2001). The long-versus short-term dimension expresses the extent that virtuous living is a goal, independent of any religious justification and is related to the ability to solve well-defined problems. The Confucian work dynamism value reflected in this dimension has been identified as almost exclusively an Asian value (Gire & Carment, 2001) and was thus not central to our research focus.

In addition to addressing the relationship between cultural value dimensions and conflict management modes, an additional contribution of the present study is its partial replication of Hofstede's Value Survey Module (VSM). The results from the plethora of cross-cultural research following Hofstede's (1980) research have to some extent been equivocal. Several researchers have tried to replicate Hofstede's country scores (Fernandez, Carlson, Stepina & Nicholson, 1997; Naumov & Puffer, 2000; Singh, 1990) sometime with findings that did not support Hofstede's results. As a consequence, cross-cultural researchers utilizing country as a surrogate for culture (based on Hofstede's scores) have often been criticized (Fernandez et al., 1997). In an effort to avoid this, we chose to use Hofstede's (2001) VSM to calculate cultural value dimensions using the same formula he used lending confidence that our replication.

In this research, we explore culture's ideational view by measuring two of Hofstede's cultural values dimension: power distance and uncertainty avoidance. We next assess the behavioral

outcome of culture by measuring respondents' preferences for the five conflict management modes: avoidance, cooperation, competition, collaborations and accommodation. To the best of our knowledge research combining both the ideational and behavioral views of culture to demonstrate how underlying value systems may be reflected in society as expressive symbols is scant at best. By combining these two views, we reinforce Fishbein and Ajzen's (1975) model that states that people's values influence their behaviors. In our case, examining Hofstede's cultural value dimensions is important in assessing how these cultural values translate into actual behaviors (conflict management modes).

## CROSS-NATIONAL EXAMINATION

The focus of this study is to compare preferences for conflict management modes in three countries – Nigeria, the U. S. and India. Comparative studies on conflict management practices have focused mainly on Asia and the U.S. (e.g., Kirkbridge, Tang, & Westwood, 1991; Leung & Wu, 1990; Ting-Toomey, Gao, Yang, Kim, Lin & Nishida, 1991; Trubisky, Ting-Toomey, Lin, 1991). Though important inroads have been made into our understanding of conflict management practices, the samples' interpersonal relationships and behavioral patterns are guided primarily by Confucian ethics (e.g., Tse, Francis, & Walls, 1994; Morris, Williams, Leung, Larrick, Mendoza, Bhatnagar, Li, Kondo, Luo and Hu, 1998), thereby limiting the scope of this knowledge . There is need for more cross-national studies of conflict management practices (Hofstede, 1993), particularly in countries such as Nigeria (Epie, 2002; Gire and Carment, 2001) and India (Luthar and Luthar, 2002; Singh, 1990).

Nigeria: Relatively few studies have examined conflict management in countries of the sub-Saharan Africa, such as Nigeria, (few exceptions include Epie, 2002; and Gire and Carment, 2001), despite the fact that researchers have emphasized the need for empirical studies on developing countries (Erondu & Sharland, 2002; Mambula, 2002). Nigeria is one of the two largest economies in the Sub-Sahara region (Feldman, 1992; Ford, 2000) and is home to major multinational corporations and their affiliates (e.g., Jason, 1997; Thompson, 1994). Understanding conflict management and negotiation skills in Nigeria is important as the Nigerian economy develops, and with the increasing presence of multi national corporations (MNCs) in Nigeria (Epie, 2002; Gire and Carment, 2001). Research has shown that conflict inducing situations proliferate with increasing corporate complexity (Murphy, 1999).

India: India is currently the fourth largest economy in the world (The Chemical Weekly, 2003) and economic forecasters predict continuing rapid growth trend (Khanna, 2001). Economic reforms in the early 1990s drastically changed India's economic profile (Ellyn, 2001) helping it become a global force in areas such as the Information Technology industry (Audirac, 2003; D'Costa, 2002). Like Nigeria, India too an increasing number of MNCs in the economy. Despite India's growing presence and stature in the global economy, researchers have not adequately

examined conflict management in India. Exceptions include Miller and Bersoff (1992) who examined the difference between American and Indian students' priorities in situations involving moral dilemmas. They examined "conflict" as a consequence of moral dilemmas rather than an outcome of inter- and intra- organizational functioning. Morris et al. (1998) examined organizational conflict with reference to cultural values, however, they only examined individualism-collectivism and two conflict management styles – avoiding and competing.

The above discussion reiterates the ongoing need for cross-national studies in management literature to compensate for the under-representation of cross-national research in some areas (power, uncertainty, and conflict management) and some geographical regions. The present investigation proposes that cultural value dimensions of societies influence behaviors such as conflict management. To assess this relationship we examine whether Hofstede's (1980) cultural value dimensions, power distance and uncertainty avoidance, influence the preference for conflict management modes in three countries - Nigeria, India, and the U.S.

## METHODS

### Sample

This is a cross-sectional, correlational research design based on data collected using surveys. The sample for this research was drawn from three student populations in three countries - Nigeria, India and the U. S. In order to accurately capture national culture values we only included respondents in our analyses who were both, born in, and citizens of, the country in which they were studying, thus countering the confounding effect of students studying abroad. Though we had 121 respondents in the U.S, we only included the 75 respondents who were born in the U.S. and possessed U.S. citizenship. The decrease in the Nigerian sample (105 to 98) and the Indian sample (101 to 99) were not as dramatic.

The Nigerian sample consisted of 98 non-traditional age undergraduate business students from a large urban university in the northern part of Nigeria. The mean age of the Nigerian respondents was 27.66 years and 64% were male. The United States sample consisted of 75 non-traditional age undergraduate students from two Northeast universities. The mean age of the respondents was 25.47 years and 47% were male. Non-traditional age students are those students who typically do not go directly to college after graduation from high school and thus are somewhat older, with some prior work experience. The Indian sample consisting of 99 MBA respondents was primarily male (over 80 %) and the average age was 23.82 years. The Indian MBA students typically go directly from their undergraduate studies to graduate work. All the students were enrolled in business programs and the surveys were administered during management classes.

**Data Collection**

Surveys were designed for this study using well-established measures for assessing conflict management modes and cultural orientation. Nigerian and Indian universities use English as their instruction language so the surveys needed only a few minor modifications (i) to ensure consistency in meaning, (ii) to account for any differences in nomenclature for the educational systems, and (iii) to account for the demographic composition of the respondents. Therefore, the surveys used for all three countries were identical on the conflict-management and cultural orientation measures with minor modifications vis-à-vis the demographic items.

The Nigerian data were collected through a contact person at a north Nigerian University. Students were assured that (1) participation in the study was voluntary (though extra credit was offered for completion of the survey), (2) that the surveys would not be graded in any fashion, and (3) that their responses were completely confidential. All respondents at the U.S. universities and the Indian universities were also told that participation in the survey was voluntary, and that their responses would be completely confidential. Extra credit was not an option for either the Indian or U.S. students.

**Measures**

*Conflict Management Modes*. Kilmann and Thomas's (1977) MODE instrument (Management-of-Differences Exercise) was used to measure the five conflict management modes – accommodating, collaborating, compromising, competing, and avoiding. This instrument consists of thirty forced-choice items that help identify individuals' conflict management modes and has been cited as one of the most extensively used conflict management style measures with sound psychometric properties (Wall & Callister, 1995). Womack (1988) reports that the reliabilities for the MODE range from .45 to .60 but despite these relatively low reliabilities reports that ".....the MODE is widely applied in organizational training..." (Womack, 1988: 327).

We measured *cultural values* by using Hofstede's (1980) items for power distance and uncertainty avoidance. We followed Hofstede's (2001) formulas for calculating the power distance scores and uncertainty avoidance scores. Higher scores on power distance indicate that respondents from that country accept differences in social inequality more easily than do respondents from countries with lower power distance scores. Countries with high scores on uncertainty avoidance have a higher need for rules and predictability compared to countries with low uncertainty avoidance scores. That is, countries with high uncertainty avoidance scores have a lower tolerance for the uncertainties of daily living.

We modified Hofstede's (2001) items to reflect a student focus. For example, one of Hofstede's (2001: 469) items measuring uncertainty avoidance asks respondents "How often do you feel nervous or tense at work?" We adapted this to ask "How often do you feel nervous or tense at

school?" In the same vein, one of Hofstede's (2001: 472) power distance items asks respondents, "How frequently, in your experience, are employees afraid to express disagreement with their managers?" We modified this item to ask students "How frequently, in your school environment, are students afraid to express disagreement with their professors/teachers?"

The surveys also collected information about student demographics such as their age, gender, religion and major. Age was measured using a rating scale for different age groups. This was later converted to a continuous variable by using the age range's mid-point as the respondents' age. For example, if a respondent indicated that his/her age was in the 20-24 year range, we recoded their age as 22 (mid-point of the range). Gender was coded as 1=women and 2= men. Respondents' religion was a categorical variable with the Nigerian respondents primarily falling into 3 groups – Christians, Muslims and Others. The Indian respondents were overwhelmingly Hindu. The U.S. respondents were predominantly Catholics and Others. The respondents' major was also a categorical variable. 90% of the Nigerian respondents were 'general management' majors. All the Indian respondents were categorized as 'general business' majors. The majors of the U.S. respondents were more diverse with two-thirds (67%) being 'general management' majors and the rest spread among accounting, finance, marketing and human resource management majors.

**Analysis**

A series of steps were taken to estimate the relationship of the independent variables to the dependent variables included in the study. First, power distance and uncertainty avoidance score calculations were made, followed by an analysis of variance (ANOVA) comparing differences in study variables among the responses from Nigeria, India and the U.S. (Table 2), and next correlation analyses (Table 1). The choice of control variables was determined by inspecting the ANOVA, the correlations and existing theory and research.

Following correlation analyses, General Linear Models (GLM) were used to analyze the data for this study. Using GLM enabled us to test whether scores obtained from the Nigerian sample of students on the five conflict management modes differed significantly from the U. S. and Indian students' scores. Researchers have recommended that when the hypothesis of no difference is rejected, researchers should examine univariate test results for the dependent variables (Howell, 1992; Tabachnick & Fidell, 1989) to assess the exact nature of the relationships.

**Results**

Our calculations for the cultural value dimensions indicated that the Power Distance Index for the Nigerian students (n=98) was 56.85 and the uncertainty avoidance index was 46.80. The Indian students (n=99) scored 25.80 on the power distance index and 24.50 on the uncertainty

avoidance index. The United States (n=75)respondents scored 38.15 on power distance index and 7.90 on the uncertainty avoidance index.

**TABLE 1: INTERCORRELATIONS AMONG STUDY VARIABLES**

| | | Means | SDs | GENDER | AGE | RELIGION | MAJOR | AVOID | ACCOM. | COMPRO. | COMPETE | COLLAB. | POWDIST. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | Nig. | 27.67 | 4.23 | -.012 | | | | | | | | | |
| | India | 23.83 | 3.37 | | | | | | | | | | |
| | U.S. | 25.47 | 6.04 | | | | | | | | | | |
| Religion | Nig. | 3.74 | 2.81 | .151* | -.094 | | | | | | | | |
| | India | 6.39 | 1.99 | | | | | | | | | | |
| | U.S. | 2.47 | 3.06 | | | | | | | | | | |
| Major | Nig. | 11.13 | 2.66 | -.357** | .311** | -.496** | | | | | | | |
| | India | 0.00 | 0.00 | | | | | | | | | | |
| | U.S. | 9.58 | 4.25 | | | | | | | | | | |
| Avoid | Nig. | 6.92 | 1.93 | .016 | .078 | -.018 | .013 | | | | | | |
| | India | 6.60 | 2.25 | | | | | | | | | | |
| | U.S. | 6.09 | 2.42 | | | | | | | | | | |
| Accom. | Nig. | 5.65 | 2.19 | -.002 | .032 | .017 | .044 | -.072 | | | | | |
| | India | 5.27 | 2.43 | | | | | | | | | | |
| | U.S. | 5.03 | 2.17 | | | | | | | | | | |
| Compro | Nig. | 5.69 | 1.94 | -.070 | -.200** | -.019 | -.167** | -.256** | -.170** | | | | |
| | India | 6.95 | 2.34 | | | | | | | | | | |
| | U.S. | 6.91 | 2.01 | | | | | | | | | | |
| Compet | Nig. | 5.22 | 2.57 | .145* | .100 | .043 | -.084 | -.269** | -.464** | -.314** | | | |
| | India | 4.80 | 3.02 | | | | | | | | | | |
| | U.S. | 5.55 | 2.82 | | | | | | | | | | |
| Collab. | Nig. | 6.22 | 1.83 | -.083 | -.164** | .026 | -.054 | -.252** | -.227** | -.086 | -.165** | | |
| | India | 6.34 | 1.95 | | | | | | | | | | |
| | U.S. | 6.37 | 2.40 | | | | | | | | | | |
| Powdist | Nig. | 56.85 | n.a. | -.179** | .341** | -.327** | .787** | .039 | .080 | -.256** | .012 | -.027 | |
| | India | 25.8 | | | | | | | | | | | |
| | U.S. | 38.15 | | | | | | | | | | | |
| Uncert Avoid | Nig. | 46.8 | n.a. | .100 | .227** | .075 | .253** | .111 | .111 | -.243** | -.029 | -.031 | .688** |
| | India | 24.5 | | | | | | | | | | | |
| | U.S. | 7.90 | | | | | | | | | | | |

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed)

The correlation analysis in Table 1 indicates several important associations. Age was associated with two of the conflict management modes - compromise ($r = -.200$, $p < .01$) and collaboration ($r = -.164$, $p < .01$) and with the cultural dimensions of power distance ($r = .341$, $p < .01$) and uncertainty avoidance ($r = -.227$, $p < .01$). The respondents' gender was correlated with competing ($r = .145$, $p < .05$) and power distance ($r = -.179$, $p < .01$). Respondents' religion was significantly correlated to their power distance scores ($r = -.327$, $p < .01$). Finally, the respondents'

major was seen to be significantly correlated to their compromising modes ($r = -.167$, $p < .01$), power distance scores ($r = .787$, $p < .001$) and uncertainty avoidance scores ($r = .253$, $p < .001$).

Table 1 also provides the mean scores on the conflict management scores by country.

Analysis of variance (Table 2) showed differences in means among countries on study variables. The analysis of variance indicated that the three sub-samples differed significantly in terms of their demographic composition (age, gender, religion, and major). The Nigerian, Indian and U.S. samples differed in terms of age {$F (2, 271) = 17.68$, $p < .001$} with the Nigerian sample having the highest mean age (27.66 years) and the Indian sample having the lowest mean age (23.82 years). Post hoc tests revealed that differences in age between the US and India students was not statistically significant, but the Nigerian students' average age was significantly higher than the two other groups.

The gender composition was different for all three groups with women representing the smallest proportion in the Indian sample {$F (2, 270) = 19.368$, $p < .001$}. Post hoc analyses revealed that the Nigerian and the U.S. samples had relatively similar percentages of women students, but that female students were significantly underrepresented in the Indian sample.

The three respondent groups differed significantly in terms of their religion {$F (2, 270) = 51.752$, $p < .001$} and majors {$F (1, 170) = 8.557$, $p < .01$}. Post hoc tests revealed that the Indian students differed significantly from their Nigerian and U.S. counterpart in terms of religion. The Indian students predominantly represented one religion (Hinduism) whereas the Nigerian and U.S. students represented a variety of religions. Post hoc analyses were not possible for students' majors as at least one of the countries had less than 2 cases in one of the sub-groups.

Given the recommendations of previous research in combination with our ANOVA and correlation analysis, we statistically controlled for the effects of age, gender, religion and major in the subsequent analysis. Thus we used statistical methods to align our sample as a precaution against mismatched samples leading to spurious results (Hofstede, 2001).

The results on the cultural dimensions indicate that the countries differed significantly in terms of both power distance {$F (2, 271) = 2.84E+31$, $p < .000$} and uncertainty avoidance {$F (2, 271) = 4.56E+31$, $p < .000$}. Among the conflict management preferences, our data indicated differences between the three groups on two modes – avoiding {$F (2, 271) = 3.015$, $p < .05$} and compromise {$F (2, 271) = 10.746$, $p < .001$}.

Post hoc analyses following the ANOVA on the two significantly different conflict management modes revealed that of the three countries, Nigerian respondents had the lowest mean score for compromising. The difference between the mean scores for India and the U.S. was not significant. In case of avoidance, the Indian respondents' mean scores bridged the Nigerian and U.S. respondents. The only statistically significant difference was between Nigeria and the U.S.

**Table 2: Results of Anova Comparing Differences in Study Variables Between the US, Nigeria and India**

| | | | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|---|
| **Control Variables** | Age | Between Groups | 728.247 | 2 | 364.124 | 17.678 | ***.000*** |
| | | Within Groups | 5540.635 | 269 | 20.597 | | |
| | | Total | 6268.882 | 271 | | | |
| | Gender | Between Groups | 7.414 | 2 | 3.707 | 19.368 | *.000* |
| | | Within Groups | 51.295 | 268 | .191 | | |
| | | Total | 58.708 | 270 | | | |
| | Religion | Between Groups | 710.129 | 2 | 355.065 | 51.752 | ***.000*** |
| | | Within Groups | 1838.705 | 268 | 6.861 | | |
| | | Total | 2548.834 | 270 | | | |
| | Major | Between Groups | 101.232 | 1 | 101.232 | 8.557 | ***.004*** |
| | | Within Groups | 1999.271 | 169 | 11.830 | | |
| | | Total | 2100.503 | 170 | | | |
| **Cultural Dimensions** | Powdist | Between Groups | 48001.557 | 2 | 24000.78 | 2.84e+31 | ***.000*** |
| | | Within Groups | .000 | 269 | .000 | | |
| | | Total | 48001.557 | 271 | | | |
| | UAI | Between Groups | 66150.125 | 2 | 33075.06 | 4.56e+31 | ***.000*** |
| | | Within Groups | .000 | 269 | .000 | | |
| | | Total | 66150.125 | 271 | | | |
| **Conflict Preferences** | Avoid | Between Groups | 28.997 | 2 | 14.499 | 3.015 | .051 |
| | | Within Groups | 1293.532 | 269 | 4.809 | | |
| | | Total | 1322.529 | 271 | | | |
| | Accom | Between Groups | 17.415 | 2 | 8.708 | 1.681 | .188 |
| | | Within Groups | 1393.787 | 269 | 5.181 | | |
| | | Total | 1411.202 | 271 | | | |
| | Compro | Between Groups | 96.031 | 2 | 48.015 | 10.746 | ***.000*** |
| | | Within Groups | 1201.910 | 269 | 4.468 | | |
| | | Total | 1297.941 | 271 | | | |
| | Compete | Between Groups | 24.595 | 2 | 12.297 | 1.559 | .212 |
| | | Within Groups | 2121.607 | 269 | 7.887 | | |
| | | Total | 2146.202 | 271 | | | |
| | Collab | Between Groups | 1.128 | 2 | .564 | .135 | .874 |
| | | Within Groups | 1124.931 | 269 | 4.182 | | |
| | | Total | 1126.059 | 271 | | | |

The results of the GLM for power distance and uncertainty avoidance and the tests for between-subjects effects are presented in Table 3. The overall model shows significant power distance and uncertainty avoidance differences in conflict management modes used by Nigerian, Indian and the U.S. students ($\underline{F} = 3.034$, $p < .01$). Therefore, following Howell's (1992) and Tabachnick and Fidell's (1989) recommendations we examined differences between each country on individual conflict management modes using tests for between-subjects effects (controlling for the students' age, gender, majors and religion). Table 3 indicates that power distance and uncertainty avoidance values are significantly related to the respondents' preference for compromising ($F= 6.905$, $p< .01$) and avoiding ($F= 3.915$, $p< .01$) conflict management modes.

**TABLE 3: RESULTS OF GLM ANALYSIS: EFFECTS OF DIFFERENCES IN PDI (POWER DISTANCE) AND UAI (UNCERTAINTY AVOIDANCE) ON CONFLICT MANAGEMENT STYLES**

| Multivariate analysis (GLM) | | | | | |
|---|---|---|---|---|---|
| Test | Statistic Value | F-Value | | | |
| Pillai's Trace | .087 | 3.034** | | | |
| Wilks' λ | .913 | 3.034** | | | |
| (b) Tests of Between-Subjects Effects | | | | | |
| | Dependent Variables | | | | |
| Variables | AVOID | ACCOMM. | COMPRO. | COMPETE | COLLABORATE |
| Control variables | | | | | |
| Age | 3.090* | .000 | 4.335* | 4.807* | 8.430** |
| *Adj. $R^2$ = 0.007* | | | | | |
| Gender | 0.018 | .078 | 1.683 | 4.200* | 1.343 |
| *Adj. $R^2$ = -.019* | | | | | |
| Religion | 0.191 | .022 | 2.735 | .341 | .560 |
| *Adj. $R^2$ = 0.111* | | | | | |
| Major | .070 | .063 | .279 | .660 | .984 |
| *Adj. $R^2$ = 0.040* | | | | | |
| CULTURE (PDI & UAI) | **3.915*** | 2.972 | **6.905**** | 2.496 | .026 |
| *Adj. $R^2$ = 0.058* | | | | | |
| † p<.10, * p<.05, **p<.01, ***p<.001 | | | | | |

## DISCUSSION

Our research addresses the impact of cultural values on conflict management mode preferences for respondents from Nigeria, India and the U.S., thus examining the relationships between ideational and behavioral aspects of culture. Major strengths of our research are combining the ideational and behavioral views of culture; exploring under-researched geographical areas of the world like Nigeria and India; and using Hofstede's (2001) formula to directly calculate cultural value indices rather than using country as a surrogate for values.

We found differences in power distance and uncertainty avoidance among the three countries at the ideational level (norms, beliefs and values), thus supporting Hofstede's (1997) view that though individuals may appear similar, the similarities are not at the foundational values system level, but rather at the behavioral level. At the behavioral level, our multivariate analysis found that the Nigerian, Indian, and U. S. respondents differed significantly in their reported preference for the compromising and avoiding conflict management modes. Thus we suggest that our findings support both the convergence view of culture (at the ideational level) and the divergence view of culture (at the behavioral level) (Child, 1981; Huo, Huang & Napier, 2002; Ralston, Holt, Terpstra & Kai-Chang, 1997).

Isolating the root of the differences in the preference for conflict management modes from our results, our post hoc analyses revealed that the Nigerian students reported the lowest preference for compromising. Their scores were significantly lower than both the Indian and the U.S. respondents' scores. An explanation for this finding is suggested by Hofstede (2001: 96) who states that students from countries with high power distance scores are likely to view the "….world as an unjust place," and have negative associations with power and wealth. He further elaborated that individuals from countries with high power distance scores were comfortable with authoritarian values and that "power is a basic fact of society that antedates good or evil: its legitimacy is irrelevant" (Hofstede, 2001: 98). Our Nigerian respondents' orientation in any conflict situation is more likely to be a win-lose one rather than a win-win orientation. Further, if individuals believe that the legitimacy of means is irrelevant, they are less likely to compromise as implicit in the compromising mode is the belief that there is equality and legitimacy in the roles of all parties involved in the conflict.

The Nigerian respondents' preference for not compromising is also in consonance with their high uncertainty avoidance scores. According to Hofstede (2001: 161), the societal norms of high uncertainty avoidance include beliefs that "the uncertainty inherent in life is felt as a continuous threat that must be fought," and "only known risks are taken." Further he states that these societies would need clarity and structure and feel powerless towards external forces. In such a social milieu, compromising may be seen as risky behavior, and a way of abdicating power to others. Therefore the Nigerian respondents may prefer to avoid compromising to decrease the feeling of risk and of giving up control to others.

Post hoc analyses of the national differences in the preference for avoiding revealed that Nigeria differed significantly only from the U.S. in terms of avoiding. This is consistent with the Nigerian high scores on the power distance and uncertainty avoidance indices. High power distance scores suggest a tendency to see authority figures as having unquestioned power within the system, thus in conflict situations, a propensity to withdraw or avoid (because the authority person's opinions will hold sway by virtue of their position) is logical. Similarly, high uncertainty avoidance scores indicate a need for more rules and regulations to deal with life's uncertainties. Avoiding or withdrawing from a situation may be a logical response for individuals from high uncertainty avoidance societies as they may be protected from the feeling of powerlessness in dealing with external pressures.

The Indian respondents' scores on the two conflict management modes (compromising and avoiding) did not differ significantly from their U.S. counterparts. With reference to compromising, the Indian respondents' scores were very close to that of the U.S. respondents' scores. Their scores bridged the Nigerian and U.S. respondents' scores with reference to avoiding. That is, the Indian respondents' avoiding scores fell between the Nigerian and U.S. respondents' scores, but were not significantly different from either Nigeria or the U.S. This finding was intuitive as the Indian respondents reported the lowest power distance scores of the three countries. Given that the Indian respondents did not share their Nigerian counterparts' power distance values, they probably did not experience the same motivation to refrain from compromising or resorting to avoidance in conflict situations. In the same vein, they did not have the same need for uncertainty avoidance that the Nigerian respondents had, and its consequent impact on their preference for certain conflict management modes.

Our findings of no differences in competing, collaborating or accommodating conflict management mode preferences support the notion of a degree of convergence in culture at the behavioral level. These findings may in large part be attributed to the unique characteristics of our business student sample. Wright and Ricks (1994) state that with the increasing dissemination of the "Business (B)-school culture" management theories from the U.S. are being globally inculcated. Thus there may be a tendency for students all over the world to increasingly resemble U.S. students at least at the behavioral level of culture.

It is possible that the Nigerian and Indian students have imbibed this "B-school" culture regarding some conflict management modes. Business schools' curricula may be promoting a high cooperation and/or high assertion paradigm among its students. Therefore, it is likely that students in Nigeria and India may be exposed to theories and practices based on highly cooperative and/or assertive frameworks (competing, collaborating and accommodating are examples). Few schools probably discuss strategies dealing with low assertion or cooperation. Consequently, it is likely that in countries with societal values differing from the U.S., dissemination of the B-school culture originating in the U.S. may modify behaviors included in the curriculum but not behaviors excluded from the curriculum. More specifically, in our study, we found no significant differences in conflict

management modes in terms of highly assertive and/or highly cooperative modes (competing, collaborating and accommodating). However, we did see significant differences in modes that dealt with low assertive and/or cooperative strategies (compromising and avoiding). Therefore, it is possible that students have imbibed behaviors and recommendations from the B-school curricula, but revert back to their societal norms and behaviors where the B-school education did not focus.

Our study has several implications for management education and development. Our results buttress the integration of social issues with the technically grounded business disciplines because we found that values were different among our business student sample (Porter & McKibbin, 1988). We hope that our study bolsters those who strive to make management education transformational and discovery-oriented, perhaps constructing learning agendas that let students discover for themselves the limits of the convergence/divergence debate (Dehler, Welsh & Lewis, 2001).

This study has some important findings; however, they should be viewed with caution. A potential limitation of the study is the use of self-report scores, which could heighten the occurrence of response bias. Future studies would benefit from multiple methodologies including interviews and other qualitative methodologies in studying conflict management modes across culture. Although, the study used business students, additional work should extend the participant base, to include multi-samples from different student populations and longitudinal research following students throughout the higher educational process and into the work world would be beneficial. Due to these limitations, our findings cannot be generalized and represent a call for a continuation of cross national research. Further research should examine conflict management modes beyond the dichotomy of "concern for self" and "concern for other" and further explore the cultural context of the compromising management style to attempt to better understand this style and its relationship to culture. Finally, the issue of behavior homogenization coupled with value differentiation needs further conceptual and empirical exploration.

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# CROSS BORDER STOCK MARKET EFFICIENCY: STOCKHOLM VERSUS U.S. STOCK PRICES

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## ABSTRACT

*In this paper we examine the relative efficiency of the U.S. and Swedish Stock Exchanges. Numerous stocks are cross-listed on United States Exchanges and the Swedish Stock Exchange. We compare the prices of these firms at near-simultaneous trading times. We find evidence of a lack of efficiency in these relative markets. Specifically, we find statistically significant pricing differences for six of the nine firms examined in the study indicating an inefficient market. We find that the pricing differences are reduced after 2003. We conduct a Granger Causality test to determine the existence and direction of causality in the series. We find that there is a feedback relationship between the U.S. price and the Stockholm price for eight of the nine series examined.*

## INTRODUCTION

Casual observation suggests that pricing differences exist on identical securities between the Stockholm Stock Exchange and United States Stock Exchanges. In this paper we examine these perceived price disparities as a test of market efficiency and to determine if an arbitrage opportunity exists. If pricing differences between the two markets exist, there is an opportunity to earn an arbitrage profit by selling short in one market and buying to offset the short position in another market.

## PRIOR RESEARCH

Numerous studies have considered different aspects of market efficiency and the relationships between cross-listed shares. Efficiency questions are typically investigated using one of two methods, autocorrelation and trading rules. Identification of serial autocorrelation was originally proposed and implemented as a method of examining market efficiency by Fisher (1966). In this framework, the existence of persistent serial correlation indicates predictive power of historical prices or returns. This, in turn, is interpreted by some as a violation of weak-form efficiency. This approach has been used in a plethora of studies since that time, many of which have found significant autocorrelations and cross-autocorrelations. Boudoukh, Richardson, and Whitelaw

(1994) provide a summary of some of this work and categorize three opposing views which attribute these correlations to either 1) market frictions, 2) time-varying economic risk premiums, or 3) market inefficiencies caused by under- and over-reactions to new information. Boudoukh, et. al. consider the autocorrelations of futures returns and returns on the underlying spot index of small-firm-weighted portfolios. They conclude that nonsynchronous trading and market frictions are the primary cause of the observed autocorrelations. They argue that the importance of frictions caused by nonsynchronous trading were previously not given enough credit for causing such autocorrelation.

Jensen (1978) proposed the measurement of profits from trading rules as an alternative method for measuring market efficiency. This approach compares the returns from a particular trading rule which is based upon historical, publicly available information, with the returns on a static or buy-and-hold strategy. A few studies which report excess profits from various trading rules are Jegadeesh (1990), Lehmann (1990), Lo and MacKinlay (1990), and Jegadeesh and Titman (1996).

Most efficiency studies have not focused on cross-listed shares. However there are many studies of how ADRs are priced. It is important to point out that not all of these studies are in agreement with respect to the factors which have the greatest impact on ADR prices. The following papers are described in effort to present the most widely tested and confirmed ideas within this area. It also points out some of the key points of contention. Werner and Kleidon (1996) investigate the intraday level of integration between U.K. shares and corresponding ADRs traded in New York. Surprisingly, they find order-flow between the markets to be segmented. However, they do find some evidence that private information in New York is incorporated into prices in both markets during the two-hour period of overlapping trading. Sundaram and Logue (1996) consider the pricing and segmentation of markets for cross-listed shares. They find that cross-listing in the U.S. enhances valuations for cross-listed shares by reducing segmentation between international equity markets.

Xu and Fung (2002) consider Chinese stocks which are dual-listed in Hong Kong and New York. They find a significant mutual feedback of pricing information and volatility between these two markets. They also conclude that the domestic market has a greater impact on pricing behavior while foreign markets have a larger impact on volatility spillover. Xu and Fung point out that numerous studies have analyzed and confirmed these relationships.[1]

The issue of causality between prices of cross-listed shares was considered by Eun and Jang (1997) who consider shares which are cross-listed in New York, London, and Tokyo. They find that pricing innovations in the 'home' market, have a significant causal impact on 'foreign' market prices. Interestingly, price innovations in New York have a significant causal impact on 'home' market prices as well. Similar results have been presented by many others, including Kato, Linn, and Schallheim (1991), Webb, Officer, and Boyd, (1995) and more recently by Bin, Morris, and Chen (2003). Bin, et. al. expand on previous work by showing that foreign exchange movements and money market interest rates also have a significant impact on ADR prices.

Kim, Szakmary, and Mathur (2000), investigate the relationship between stock prices of U.S. traded depository receipts and their underlying securities. They find that the price of the underlying security has the greatest impact on ADR prices, however, exchange rates and the U.S. market also have a significant impact on prices. Interestingly, their results indicate that ADR prices do not fully react to these three variables within a single trading day. Rather, ADRs initially overreact to price changes in the U.S. market and initially under react to price changes in the 'home' market and exchange rate changes.

Fang and Loo (2002) as well as many others have considered the diversification benefits of ADRs. Their findings indicate that ADR prices are affected most strongly by 'home' market price performance, indicating segmentation between these markets as opposed to integration. This leads ADRs to behave similar to a foreign stock. Therefore they provide a benefit of global risk reduction when added to a domestic stock portfolio.

In this paper we conduct another test of market efficiency. Specifically, we examine pricing errors on stocks that are traded on both the Stockholm and U.S. stock exchanges. As such, this paper provides additional insight into the pricing of cross-listed securities.

## DATA

The data for this study are those firms that are traded on both a U.S. stock exchange and the Stockholm Stock Exchange. Seventeen stocks are dual-listed on a U.S. stock exchange and on the Stockholm Stock Exchange. Complete data was available for nine of these stocks. The remainder were eliminated from the analysis due to insufficient availability of data. Data on stock prices at the Stockholm stock exchange was collected from the exchange website at: (www.stockholmsborsen.se). Data on stock prices on U.S. exchanges was obtained from Yahoo! Financial (http://chart.yahoo.com/d). Data was retrieved dating as far back as January 1998 and extending through February 5, 2004. The data were adjusted to reflect differences in share magnitude, for example, in the case of both the Ericsson Company and Swedish Match, one ADR is equivalent to ten shares on the Stockholm exchange. Data was available for the nine included stocks included in the study but not for the eight stocks which were excluded.

In order to determine the extent to which pricing differences exist, daily exchange rate information was needed. The exchange rate between the U.S. dollar and Swedish Krona was collected from the Pacific Exchange Rate Service at: (http://fx.sauder.ubc.ca/data.html). The US dollar was set as the base currency.

In order to complete the analysis, the stock price data on each of the exchanges as well as the exchange rate data had to be synchronized by time. This synchronization was a two step process. The first step in the process was to match the trading dates of the data. Because of differences in Trading Holidays, on some dates data is not available on both exchanges. In instances where either the Stockholm Exchange, or the U.S. exchanges were closed, the date was eliminated

from consideration. In addition, there were several dates where data were not available for unexplained reasons. This lack of data is likely because of a lack of trading. Specifically, nine observations were eliminated for SW Match and three observations were eliminated for Tele 2.

Second, it was necessary to synchronize the data by time-of-day. There are six hours time difference between New York and Stockholm. As such, collecting closing data from each of the exchanges would leave significant time differences in the data. Complicating this factor is that the U.S. stock exchanges and the Stockholm Exchange do not share common trading hours. The Stockholm stock exchange closes at 5:30 p.m. each day local time while the NYSE closes at 4:00 p.m. each day. Thus, there are eight and one half hours difference between the close of trading on the Stockholm Exchange and the NYSE. The NYSE opens for trading each day at 9:30 AM local time. To address these synchronization issues, opening price data were collected for the U.S. stock exchanges while closing data were obtained from the Stockholm Exchange. By completing the analysis in this fashion, the time difference between the data is minimized. Using this technique, the time difference between the data collection points will be no more than two hours. To the extent that the closing price collected on the Stockholm exchange is for a trade that was completed prior to the close, or the extent that the opening price obtained from the NYSE is for a trade that occurred after the exchange opened, the time difference would be less than two hours.

While intraday data could improve the synchronization of the data, intraday data was not available to the authors. While this is clearly a limitation of the study, it does not render the results invalid. First, other notable efficiency studies have been conducted using non synchronous data including Rendleman and Carabini (1979). Second, the timing difference will not introduce a bias into the study as long as there is not a systematic bias in stock prices throughout the trading day. It should be expected that any pricing differences related to timing errors would be random. That is, it would be equally likely that the price would be higher or lower on one exchange or the other as a result of any timing differences.

## TEST RESULTS:

Table 1 contains summary statistics regarding the firms in the sample. Column 2 is the ticker symbol for the firm, followed by the beginning date of the data and the ending date of the data. The number of data points for the firms ranges from 949 through 1,447. We also report average daily trading volume for each firm on the U.S. exchange as obtained on June 1, 2004 from Yahoo.com., and from the Stockholm exchange as reported by the exchange. Finally, the U.S. exchange where the shares are traded is noted.

In Table 2 we begin reporting price data. To compare the prices of stocks in the U.S. and Stockholm, we begin by converting the price reported on the Stockholm exchange to an equivalent U.S. dollar price. This is done for each day in the sample by dividing the daily price on the

Stockholm exchange by the matched exchange rate for the same day. Next, the daily difference in price between the Stockholm exchange and the U.S. exchange is computed as follows:

**Table 1: Sample Firms**

| Company | Ticker | Data Start | Data End | Observations | Avg. Daily Trade Volume in U.S. | Avg. Daily Trade Volume in Stockholm | U.S. Exchange |
|---|---|---|---|---|---|---|---|
| Astrazeneca | AZN | 4-6-1999 | 2-6-2004 | 1,149 | 1,097,183 | 692,930 | NYSE |
| Autoliv | ALV | 1-2-1998 | 2-6-2004 | 1,447 | 372,772 | 597,055 | NYSE |
| Biacore | BCOR | 1-31-2000 | 2-6-2004 | 949 | 1,181 | 18,273 | NASDAQ |
| Electrolux | ELUX | 1-2-1998 | 2-6-2004 | 1,437 | 14,545 | 2,177,050 | NASDAQ |
| Ericsson | ERICY | 1-2-1998 | 2-6-2004 | 1,446 | 3,634,863 | 212,281,065 | NASDAQ |
| Maxim | MAXM | 1-2-1998 | 2-6-2004 | 1,446 | 492,123 | 276,221 | NASDAQ |
| Oxigene | OXGN | 1-2-1998 | 2-6-2004 | 1,440 | 260,136 | 62,693 | NASDAQ |
| Tele2 | TLTOA | 1-2-2000 | 2-6-2004 | 967 | 49 | 709,232 | NASDAQ |
| SW Match | SWMAY | 1-2-2000 | 2-6-2004 | 963 | 1,000 | 2,134,424 | NASDAQ |

$$Diff = \frac{SEKprice}{ExchangeRate} - USEXprice$$

Where:

SEKprice = the price on the Stockholm Exchange for a given day
Exchange Rate = the exchange rate for the matching day
USEXprice = the price on the U.S. exchange

Next, the number of days where the price on the Stockholm exchange is higher than that on the U.S. exchange and vice versa are computed. The results are recorded in columns 3 and 4 of Table 2. The column labeled > 0 indicates those instances where the price is higher in Stockholm that in the U.S. The column labeled < 0 indicates those instances where the price is higher in the U.S. than in Stockholm. For Astrazenca, there were 557 observations where the price was higher in Stockholm than in the U.S. There were 592 observations where the price was higher in the U.S. than in Stockholm. We continue by examining the magnitude of the pricing errors. Columns 5 and 6 indicate those observations where the pricing difference exceeded $0.50 per share. For Astrazeneca, there were 166 observations where the price in Stockholm were more than $0.50 per share higher than in the U.S. There were 210 observations where the price was more than $0.50 per share higher in the U.S. than in Stockholm. Next we examine situations where the price difference

is more than $1.00 per share. There were 26 observations where the price in Stockholm were more than $1.00 per share higher than in the U.S. There were 53 observations where the price was more than $1.00 per share higher in the U.S. than in Stockholm.

**Table 2: Pricing Error Summary**

| Company | Observations | >0 | <0 | >0.5 | <-0.5 | >1 | <-1 |
|---|---|---|---|---|---|---|---|
| Astrazeneca | 1,149 | 557 | 592 | 166 | 210 | 26 | 53 |
| Autoliv | 1,447 | 903 | 544 | 322 | 34 | 72 | 4 |
| Biacore | 949 | 519 | 444 | 267 | 235 | 105 | 87 |
| Electrolux | 1,437 | 730 | 717 | 178 | 189 | 37 | 46 |
| Ericsson | 1,446 | 743 | 703 | 106 | 93 | 25 | 33 |
| Maxim | 1,446 | 519 | 444 | 267 | 235 | 105 | 87 |
| Oxigene | 1,440 | 732 | 708 | 50 | 58 | 11 | 11 |
| Tele 2 | 967 | 544 | 423 | 251 | 201 | 114 | 96 |
| SW Match | 963 | 519 | 444 | 267 | 235 | 105 | 87 |

While the existence of short term pricing errors is not uncommon, the existence of persistent pricing errors is much less common. In Table 3, we repeat the analysis of Table 2, only data subsequent to January 1, 2003 is included in the analysis. By including only data subsequent to January 1, 2003, the extent to which pricing errors persist in the market is examined. The evidence suggests that after January 1, 2003, large pricing errors were less common. There were only a small number of instances where the pricing error exceeded $1 per share subsequent to January 1, 2003. This finding is consistent with a market that is moving toward increasing efficiency.

**Table 3: Pricing Error Summary Post 2002**

| Company | Observations | >0 | <0 | >0.5 | <-0.5 | >1 | <-1 |
|---|---|---|---|---|---|---|---|
| Astrazeneca | 262 | 112 | 150 | 13 | 20 | 2 | 4 |
| Autoliv | 262 | 119 | 143 | 7 | 9 | 0 | 0 |
| Biacore | 262 | 130 | 131 | 28 | 37 | 3 | 7 |
| Electrolux | 262 | 120 | 142 | 16 | 20 | 2 | 1 |
| Ericsson | 262 | 127 | 135 | 5 | 3 | 0 | 0 |
| Maxim | 262 | 124 | 138 | 1 | 1 | 0 | 0 |
| Oxigene | 262 | 117 | 145 | 7 | 8 | 4 | 0 |
| Tele 2 | 262 | 157 | 105 | 48 | 36 | 11 | 9 |
| SW Match | 262 | 133 | 129 | 72 | 77 | 25 | 34 |

Finally, in Table 4, we test to determine if the pricing errors noted thus far are significant. The test is conducted in two ways. The first test is based on the difference in price between the U.S. and Stockholm on any given day. A t-test for difference in means is used to determine if the differences are significantly different from zero. If there is not a systematic pricing error, one would expect that on average these pricing error differences would be equal to zero. To the extent that these differences are significantly different from zero, there is evidence of miss pricing. The t-test for differences in means rejects the null hypothesis of a zero pricing error for six of the nine firms in the sample. This indicates a systematic pricing error difference. For Astrazeneca, the mean difference is -0.035. That is, the mean pricing error is $0.035 per share with the price in the U.S. being higher than in Stockholm.

Next, we examine the absolute value of the differences. Examining the absolute value of the differences allows us to further examine the magnitude of the errors. The results are reported in Columns 5 and 6 of Table 4. The mean absolute difference for Astrazeneca is $0.4238, indicating a clear pricing disparity. That is: while the difference may be positive or negative, on average there is a $0.4238 difference in price between the U.S. and Stockholm markets on any given day.

Given the pricing differences identified thus far, it is useful to explore these pricing differences further. Specifically, the Granger Causality as developed by Granger, 1969. If price changes in Stockholm cause changes in the U.S., then it is expected that price changes in Stockholm will precede price changes in New York. If price changes in the U.S. cause changes in Stockholm, then it is expected that price changes in the U.S. will precede price changes in Stockholm. Granger causality provides a test of the direction of causality. The Granger Causality test is specified by two equations as follows:

$$NY_t = \alpha_0 + \alpha_1 NY_{t-1} + \alpha_2 NY_{t-2} \ldots + \lambda_1 SH_{t-1} + \lambda_2 SH_{t-2} \ldots + \varepsilon_t \quad (1)$$

$$SH_t = \alpha_0 + \alpha_1 SH_{t-1} + \alpha_2 SH_{t-2} \ldots + \lambda_1 NY_{t-1} + \lambda_2 NY_{t-2} \ldots + \varepsilon_t \quad (2)$$

Where:

$SH_t$ = the stock price in Stockholm
$NY_t$= the stock price in the United states
t = a time indicator
$\epsilon_t$= a random error term

**Table 4: Tests for Significant Pricing Differences**

| Company | Observations | Mean Diff | t-test Differences | Mean Abs Diff | T test ABS Differences |
|---|---|---|---|---|---|
| Astrazeneca | 1,149 | -0.035<br>0.0163 | -2.17 0.0304** | 0.4238<br>0.0105 | 40.26<br>0.0001*** |
| Autoliv | 1,447 | 0.2858<br>0.0084 | 33.91<br>0.0001*** | 0.3000<br>0.0081 | 37.41<br>0.0001*** |
| Biacore | 949 | 0.0384<br>0.026 | 1.48<br>0.1397 | 0.5672<br>0.0184 | 30.84<br>0.0001*** |
| Electrolux | 1,437 | -0.315<br>0.1159 | -2.72<br>0.0066** | 0.6926<br>0.1147 | 6.04<br>0.0001*** |
| Ericsson | 1,446 | 0.0607<br>0.0236 | 0.62<br>0.5377 | 0.2835<br>0.0224 | 12.68<br>0.0001*** |
| Maxim | 1,446 | -0.081<br>0.016 | -5.06<br>0.0001*** | 0.3278<br>0.0136 | 24.05<br>0.0001*** |
| Oxigene | 1,440 | -0.03<br>0.008 | -0.33<br>0.7438 | 0.2007<br>0.006 | 33.46<br>0.0001*** |
| Tele 2 | 967 | 0.1032<br>0.053 | 1.95<br>0.0516* | 0.7453<br>0.0473 | 15.74<br>0.0001*** |
| SW Match | 963 | 0.1617<br>0.068 | 2.38<br>0.0177** | 0.7519<br>0.0638 | 11.79<br>0.0001*** |

*** indicates significance at the 1 percent level,
** indicates significance at the 5 percent level and * indicates significance at the 10 percent level. In the Mean Cell: The First figure is the mean difference and the second figure is the standard error. In the t-test cell, the first figure is the t-statistic and the second figure is the p-value.

The Granger Causality Technique requires stationary series. An Augmented Dickey-Fuller test is conducted to determine if the series meet this requirement (Dickey and Fuller 1979 and 1981). For eight of the nine series, the test fails to reject the existence of a unit root. For the Biacore series, the Dickey fuller test rejected the existence of a unit root, indicating that the series is stationary in its level form. A number of techniques can be employed to control for the problems caused by non-stationary data series. We control non-stationarity, by transforming the variables into their first difference form. That is the measurement unit is the daily change in the level of the variable. For consistency, the difference form is used for all nine data series, including the Biacore series. An augmented Dickey-Fuller test is conducted on the first differences to determine the stationarity of the transformed series. For each of the transformed data series, the existence of a unit root is rejected, indicating that the series are stationary.

**Table 5: Granger Causality Test Results**

| Series | Dependent Variable | Lags NY | Lags SH | F-Statistic | $R^2$ |
|---|---|---|---|---|---|
| Astrazeneca | SH | 5 | 5 | 18.81*** | 0.1548 |
| Astrazeneca | NY | 5 | 5 | 9.59*** | 0.0853 |
| Autoliv | SH | 3 | 2 | 4.39*** | 0.0151 |
| Autoliv | NY | 3 | 2 | 149.12*** | 0.3416 |
| Biacore | SH | 9 | 4 | 3.04*** | 0.0409 |
| Biacore | NY | 9 | 4 | 27.51*** | 0.2788 |
| Electrolux | SH | 3 | 2 | 1.71 | 0.0059 |
| Electrolux | NY | 3 | 2 | 2.31** | 0.0080 |
| Ericsson | SH | 4 | 7 | 13.22*** | 0.0925 |
| Ericsson | NY | 4 | 7 | 5.32*** | 0.0394 |
| Maxim | SH | 9 | 10 | 7.39*** | 0.0903 |
| Maxim | NY | 9 | 10 | 41.01*** | 0.3551 |
| Oxigene | SH | 9 | 9 | 2.71*** | 0.0334 |
| Oxigene | NY | 9 | 9 | 33.77*** | 0.3011 |
| Tele 2 | SH | 5 | 6 | 5.85*** | 0.0636 |
| Tele 2 | NY | 5 | 6 | 31.29*** | 0.2666 |
| SW Match | SH | 6 | 10 | 2.70*** | 0.0442 |
| SW Match | NY | 6 | 10 | 18.00*** | 0.2360 |

SH indicates the first difference of daily prices in Stockholm and NY indicates the first difference of daily prices in New York. Lags NY indicates the number of lags on NY that were included in the Granger Causality equations and Lags SH is the number of lags on SH what were included in the Granger Causality equations.
*** indicates significance at the 1 percent level,
** indicates significance at the 5 percent level and
* indicates significance at the 10 percent level.

The optimal number of lag variables to include in the Granger Causality model is determined by including the number of lags that minimize the Akaike Information Criterion (Akaike, 1974) from the regressions.

$$NY_t = \alpha_0 + \alpha_1 NY_{t-1} + \alpha_2 NY_{t-2} \ldots + \varepsilon_t \quad (3)$$

$$SH_t = \alpha_0 + \alpha_1 SH_{t-1} + \alpha_2 SH_{t-2} \ldots + \varepsilon_t \quad (4)$$

The number of lags that minimized the Akaike Information Criteria are included in the following Granger Causality regressions.

The results of the Granger Causality Tests are reported in Table 5. For eight of the nine series both of the regressions are significant indicating a feedback type of relationship where the price in Stockholm has an influence on the price in the U.S. and the price in the U.S. has a influence on the price in Stockholm. For the Electrolux series, the F-statistic for the regressions on the Stockholm price are not significant, while the F-statistic for the regressions on the U.S. price are significant. This combination of results indicates that the price in the U.S. Granger Causes the price in Stockholm.

## CONCLUSIONS

In this paper we analyze the efficiency of the Stockholm versus U.S. stock exchanges. We examine nine firms that are dual-listed both on the Stockholm exchange and one of the U.S. exchanges from 1998 through 2004. Opening data for the U.S. exchanges was compared to closing data for the Stockholm exchange daily. In doing so, the data was synchronized to a maximum of a two hour time difference. We find significant pricing differences between the two markets. We reject that the average difference in prices is zero for six of the nine firms in the sample. These results provide evidence of a potential arbitrage opportunity and a violation of weak form market efficiency. The evidence suggests that the price differences were substantially reduced after January 1, 2003. We find that in all but one series, a feedback relationship between the two series exists. In the case of Electrolux, the price in the U.S. is found to Granger Cause the price in Stockholm. Like some prior market efficiency studies, the analysis here is limited by less than perfectly synchronized data. While intraday data could potentially provide more closely synchronized analysis, such data was not available to the authors.

## ENDNOTES

[1] See Eun and Shim (1989), Kwan, Sim, and Cotsomitis (1995), and Ghosh, Saidi, and Johnson (1999) for more on pricing relationship. Liu, Pan, and Fung (1996), Bekaert and Harvey (1997), and Ng (2000) each find significant volatility spillover from the U.S. to various Pacific Basin markets.

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# DOES THE PRESENCE OR LACK OF INTELLECTUAL PROPERTY RIGHT PROTECTION AFFECT INTERNATIONAL TRADE FLOWS IN EMERGING MARKET ECONOMIES? AN EXPLORATORY STUDY

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## ABSTRACT

*This study provides new evidence regarding the effects of patent protection on international trade in developing countries also known as "emerging market economies". It employs a gravity model of bilateral trade flows and estimates the effects of increased protection on a cross-section of 69x68 countries. It improves on previous studies in two respects. First, we estimate the gravity model for two different kinds of aggregates: total non-fuel trade and high technology trade. Second, it addresses the problem of zero trade flows between countries by adopting a bivariate distributed probit regression model. Third, to measure the strength of Intellectual Property Rights (IPRs) regimes, we make use of a fine tuned index on national IPRs systems developed by Park and Ginarte (1996). Our results confirm previous findings suggesting a positive link between IPRs protection and trade flows for the non-fuel trade aggregate. However, IPRs are not found to be significant for high technology trade flows.*


## INTRODUCTION

Intellectual property rights (IPRs) affect international trade flows when knowledge intensive goods move across national boundaries. The importance of IPRs for trade has gained more significance as the share of knowledge-intensive or high technology products in world trade has doubled between 1990 and 2003 from 12% to 24% (UN Comtrade Data Base). At the international level, IPRs have traditionally been governed by several conventions – most prominently the Paris Convention for patents and trademarks and the Berne Convention for copyright –, which are administered by the World Intellectual Property Organization (WIPO). In the 1980s, mounting disputes over IPRs lead to the inclusion of trade-related IPRs on the agenda of the GATT/WTO Uruguay round and the resulting "Trade Related Intellectual Property Rights Agreement, including Trade in Counterfeit Goods" (TRIPs) of 1994 represents the most far-reaching multilateral agreement towards global harmonization of IPRs.

Several studies have attempted to estimate the extent to which IPRs are trade-related. Maskus and Penubarti (1995) use an augmented version of the Helpman-Krugman model of monopolistic competition to estimate the effects of patent protection on international trade flows. Their results indicate that higher levels of protection have a positive impact on bilateral manufacturing imports into both small and large developing economies. These results are confirmed by Primo Braga and Fink (1997) where we estimated a similar model and found the same positive link between patent protection and trade flows.

The purpose of this study is to provides additional evidence regarding the effects of patent protection on the international trade patterns of developing economies. It employs a gravity model of bilateral trade flows and estimates the effects of increased protection on a cross-section of 69x68 countries. The next section presents the methodology. Section III describes the empirical results obtained while Section IV concludes the paper.

## METHODOLOGY

To empirically estimate the effects of increased patent protection on bilateral trade flows we use a conventional gravity model. Gravity model has been applied successfully to explain different types of international flows, such as migration, commuting, recreational traffic, and trade. Typically, they specify that a flow from country *i* to country *j* can be explained by supply conditions in country *i*, by demand conditions in country *j*, and by forces either assisting or resisting the flow's movement. Gravity models were developed based on intuitive reasoning rather than economic modeling. Due to their empirical success, there have been numerous attempts to shed some light on the economic underpinnings of the gravity equation. Linneman (1966) showed how standard gravity equation can be derived from a quasi-Walrasian general equilibrium model of export supply and import demand. Bergstrand (1989) used a general equilibrium world trade model assuming utility-and profit-maximizing agent behavior and showed that the gravity model "fits in the Heckscher-Ohlin model of inter-industry trade and the Helpman-Krugman-Markusen of intra-industry trade.

Our dependent variables are bilateral trade flows for 69x68 countries which were extracted from the United Nations Comtrade database. The data refer to 2003 total non-fuel and high technology trade. The rationale for using high technology trade flows besides total non-fuel trade is based on the a priori expectation that the effects of IPRs protection are stronger for knowledge-intensive trade.

Following earlier specifications of gravity models, our explanatory variables are GDP and population of both countries *i* and *j*, geographical distance between the two countries, a dummy variable which is one of the two countries share a common border and zero otherwise, and a dummy variable which is one of the two countries share the same language and zero otherwise. See, for

example, Tinbergen (1962), Linneman (1966), Aitken (1973), Pelzman (1977), and Primo Braga, Safadi and Yeats (1994). The coefficients on GDP are expected to be positive and around unity (Anderson 1979); the coefficients on population are expected to be small and negative, representing economies of scales (Linneman 1966). Positive geographic and cultural distance are expected to have a negative influence on bilateral trade flows, that is the coefficient on geographical distance is expected to be negative, the coefficients on common border and language are expected to be positive.

Finally to capture the effect of intellectual property rights on bilateral trade flows we use the IPRs index developed by Park and Ginarte (1996). This index grades national IPRs regimes of 110 countries on a scale from zero to five. To compute a country's ranking, Park and Ginarte (1996) create five different categories – extent of coverage, membership in international patent agreements, provisions for loss of protection, enforcement mechanisms and duration of protection. For each category, they use several benchmark criteria (e.g. patentability of pharmaceuticals for extent of coverage) and compute the share of "fulfilled" criteria. A country's score is the unweighted sum of these shares over all categories. The United States receives the highest score, 4.52; several nations without patent laws (e.g., Angola, Burma, Ethiopia, Papua New Guinea) receive a score of 0.

A common problem regarding the estimation of bilateral trade flows are reported as zero because countries do not trade with each other. For example, in our data set on average about 26% of the total non-fuel trade flows and 53% high technology trade flows are zero. A standard log-linear model with a log-normally distributed error term can not , by definition, explain these zero trade flows. Simple exclusion of zero trade flows would lead to potential sample selection bias. There are several ways how to address this problem. We follow Bikker and de Vos (1992), who propose a bivariate normally distributed probit regression. The model consists of an equation for the probability of zero observations and an equation for the magnitude of a positive action:

$$I_{ij} = \begin{cases} 0 & if\, z_{ij} y + v_{ij} \le 0 \\ y_{ij} & if\, z_{ij} y + v_{ij} \ge 0 \end{cases} \qquad (1)$$

$$\gamma_{ij} = x_{ij} \beta + u_{ij} \qquad (2)$$

$I_{ij}$ is the observed phenomenon which is 0 if the bilateral trade flow between country *i* and *j* zero and $y_{ij}$ - the log of bilateral trade – if the trade flow is positive; $z_{ij}$ is the log of the variables explaining the probability of a positive observation (the gravity variables without the preferential trading dummies and the Park and Ginarte index), and γ the corresponding vector of coefficients for these variables. $v_{ij}$ is a normally distributed error term with mean zero; the variance of $v_{ij}$ is

normalized to one as all parameters γ are determined apart from a constant. $x_{ij}$ is the logarithm of the explanatory variables for positive trade flows (the gravity variables and the Park and Ginarte index), $\beta$ the corresponding vector of coefficients to be estimated, and $u_{ij}$ a normally distributed error term with mean zero and variance $\sigma^2$. The error terms $v_{ij}$ and $u_{ij}$ are correlated with each other and drawn from a bivariate normal distribution with a correlation coefficient equal to $\rho$. Equations (1) and (2) are estimated by maximum likelihood technique.

Besides addressing the problem of sample selectivity, the bivariate probit regression model is attractive because it also estimates the effects of explanatory variables (such as IPRs) on the probability that two countries trade with each other. To evaluate the robustness of the results, we estimate these two model specifications for both exports – bilateral trade flows from country *i* to country *j* as reported by country *i* – and imports – bilateral trade flows from country *j* to country *i* as reported by country *i*. Since we are primarily interested in the role of IPRs in attracting trade flows and not in creating trade flows, we only use the Park and Ginarte index of the destination country of the trade flow as explanatory variable (that is country *j* in the case of exports and the country *i* in the case of imports).

## EMPIRICAL RESULTS

Our estimation results are presented in Tables 1 through 3. The overall performance of the model is quite good. Most gravity variables have the expected signs and are statistically significant. Exceptions are for total non-fuel trade (Tables 1 and 2) the coefficient on the border dummy are, however, not significant. For the high technology aggregate (Table 3), the exceptions are similar: the coefficients on the border dummy is not statistically significant. Likelihood ratio tests indicate that for all alternative specifications estimated the explanatory variables are jointly significantly different from zero.

The estimated correlation coefficients between the probit and gravity equations $\rho$ are always close to zero and not statistically based on a likelihood ratio test for both total non-fuel and high technology trade. For both total non-fuel imports and exports, the Park and Ginarte index has only a small effect on the probability of positive trade flows between countries, although the effect is positive and statistically significant at the 5% level for total non-fuel exports. Turning to the gravity equation, IPRs have significantly positive impact on bilateral trade flows for both total non-fuel imports and exports. Comparisons of models (I) and (II) in Tables 1 and 2 suggests that inclusion of IPRs leads to relatively small changes in the coefficients of most gravity variables. The biggest changes occur in the coefficients on GDP and population of the destination country of the trade flow. These changes can be explained by the strong correlation strength of IPRs protection and the level of economic development as measured by per capita GDP. To what extent we pick up development related effects related to bilateral trade with the Park and Ginarte index remains open to discussion.

| Table1: Maximum Likelihood Estimates for Total Non-Fuel Imports[a] | | | | |
|---|---|---|---|---|
| Model | (I) | | (II) | |
| Equation | Probit | Gravity | Probit | Gravity |
| *Intercept* | -7.000 (-27.40) | -10.228 (-29.02) | -6.960 (26.28) | -10.956 (-30.58) |
| $GDP_i$ | 0.541 (31.47) | 1.109 (51.73) | 0.545 (29.90) | .949 (34.98) |
| $GDP_j$ | 0.567 (32.36) | 1.341 (61.89) | 0.566 (32.33) | 1.339 (62.12) |
| $Population_i$ | -.0194 (-9.80) | -0.233 (-8.53) | -0.198 (-9.17) | -0.082 (-2.64) |
| $Population_j$ | -0.058 (-3.03) | -0.333 (-12.76) | -0.058 (-3.03) | -0.336 (-12.97) |
| *Distance* | -0.435 (-12.17) | -1.109 (-23.87) | -0.437 (-12.15) | -1.060 (-23.20) |
| *Border* | -0.376 (-2.32) | 0.179 (0.91) | -0.378 (-2.33) | 0.239 (1.27) |
| *Language* | 0.592 (8.67) | 0.861 (9.50) | 0.591 (8.66) | 0.867 (9.62) |
| *IPRs*[b] | | | -0.014 (-0.53) | 0.369 (9.59) |
| $\rho$ | | 2.100 | | 2.083 |
| *Obs.* | 7304 | 5492 | 7304 | 5492 |
| $\rho$ | -0.034 | | -0.043 | |
| $-2ln\lambda\ (\rho = 0)$[c] | 0.853 | | 1.346 | |
| $-2ln\lambda\ (\{\gamma,\beta\}= 0)$[c] | 8874.433 | | 8965.677 | |

[a]t-statistics in parentheses

[b] Park and Ginarte index of the destination country of the trade flow, that is country *j* in the case of exports and country *i* in the case of imports.

For high technology trade in Table 3 the evolving pattern is different. For both exports and imports, the Park and Ginarte index has a significantly negative impact on the probability that countries trade with each other. The impact of IPRs on positive trade flows, in turn is slightly negative but not statistically significant. This result is somewhat surprising. If IPRs influence trade flows, we would expect this influence to be most visible for trade in knowledge-intensive goods. Several explanations can be brought forward. First, strong market power effects in the case of high technology goods may offset positive market expansion effects caused by stronger IPRs regimes. Second, stronger IPRs regimes may cause high technology firms to serve foreign markets by FDI, in-part substituting for trade flows. Third, it may be that the Park and Ginarte index does not correctly capture the IPRs effect or that development related effects interplay with stronger IPRs protection.

| Table 2: Maximum Likelihood Estimates for Total Non-Fuel Exports[a] | | | | |
|---|---|---|---|---|
| Model | (I) | | (II) | |
| Equation | Probit | Gravity | Probit | Gravity |
| *Intercept* | -6.631 (-27.77) | -10.791 (-29.31) | -6.766 (-27.10) | -11.170 (-29.55) |
| $GDP_i$ | 0.556 (33.86) | 1.374 (60.26) | 0.556 (33.85) | 1.374 (60.38) |
| $GDP_j$ | 0.458 (29.84) | 1.017 (46.85) | 0.443 (25.93) | 0.945 (35.11) |
| $Population_i$ | -0.052 (-2.84) | -0.320 (-12.18) | -0.052 (-2.83) | -0.3320 (-12.20) |
| $Population_j$ | -0.153 (-8.15) | -0.137 (-4.90) | -0.137 (-6.57) | -0.070 (-2.17) |
| *Distance* | -0.473 (-13.55) | -1.114 (-23.69) | -0.467 (-13.34) | -1.100 (-23.41) |
| *Border* | -0.393` (-2.54) | 0.301 (1.52) | -0.381 (-2.47) | 0.328 (1.65) |
| *Language* | 0.588 (8.96) | 0.826 (8.95) | 0.588 (8.97) | 0.826 (8.98) |
| *IPRs*[b] | | | 0.047 (1.92) | 0.176 (4.46) |
| *r* | | 2.113 | | 2.109 |
| *obs.* | 7309 | 5294 | 7309 | 5294 |
| *r*<br>*-2lnl (r = 0)* [c]<br>*-2lnl ({g,b}= 0)* [c] | *0.005*<br>*0.016*<br>*8520.968* | | *0.002*<br>*0.003*<br>*8544.524* | |

[a] *t-statistics in parentheses*
[b] *Park and Ginarte index of the destination country of the trade flow: country j for exports and country i for imports.*

| Table 3: Maximum Likelihood Estimates for High Technology Imports[a] | | | | |
|---|---|---|---|---|
| Model | (I) | | (II) | |
| Equation | Probit | Gravity | Probit | Gravity |
| Intercept | -5.494 (-27.17) | -14.487 (-26.21) | -4.794 (-22.87) | -14.313 (-26.95) |
| $GDP_i$ | 0.568 (40.12) | 0.911 (22.68) | 0.717 (39.04) | 0.960 (16.69) |
| $GDP_j$ | 0.495 (36.36) | 1.898 (52.12) | 0.512 (36.45) | 1.897 (52.38) |
| $Population_i$ | -.0324 (-18.71) | -0.086 (-2.06) | -0.474 (-22.59) | -0.132 (-2.38) |
| $Population_j$ | -0.170 (-10.31) | -0.733 (-20.70) | -0.175 (-10.43) | -0.731 (-20.70) |
| Distance | -0.421 (-13.56) | -1.115 (-19.11) | -0.466 (-14.62) | -1.124 (-19.00) |
| Border | 0.011 (0.08) | 0.157 (0.64) | -0.110 (-0.78) | 0.141 (0.61) |
| Language | 0.480 (8.54) | 1.154 (9.53) | 0.488 (8.43) | 1.146 (9.49) |
| IPRs[b] | | | -0.340 (-14.09) | -0.093 (-1.50) |
| r | | 2.229 | | 2.228 |
| Obs. | 7304 | 3548 | 7304 | 3548 |
| *r*<br>*-2lnl (r = 0)* [c]<br>*-2lnl ({g,b}= 0)* [c] | *0.066*<br>*1.354*<br>*7606.860* | | *0.064*<br>*1.309*<br>*7812.274* | |

[a] *t-statistics in parentheses*
[b] *Park and Ginarte index of the destination country of the trade flow: country j for exports and country i for imports.*

## SUMMARY AND CONCLUSION

With an increasing share of knowledge-intensive products in international trade and the inclusion of trade-related IPRs on the agenda of the GATT/WTO, IPRs have become an important trade issue.

Economic analysis suggests that the effects of IPRs protection on bilateral trade flows are theoretically ambiguous. Because of the complex static and dynamic considerations related to a policy of tighter protection, it is difficult to generate normative recommendations. When estimating the effects of IPRs protection in a gravity model of bilateral trade flows, our empirical results suggest that, on average, higher levels of protection have significantly positive impact on non-fuel trade. However, this result is not confirmed when confining the estimation to high technology goods where we found IPRs to have no statistically significant impact.

More empirical research is needed to gain more insight regarding the IPRs-trade link, especially at industry and firm level. The challenge of such research will be to find 'natural experiments' to overcome the colineraty and endogeneity problems of the cross-country type of analyses like the present study. One alternative, for instance, would be to consider a country which at some point in the past significantly changed its system of IPRs and to test for structural change. A further important field of research is to examine the impact of tighter IPRs on FDI and their interplay with trade flows.

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# DYNAMICS OF EXTERNAL DEBTS AMONG HEAVILY INDEBTED POOR COUNTRIES (HIPCs): A PANEL DATA APPROACH

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## ABSTRACT

*This study uses panel data for 29 Heavily Indebted Poor Countries (HIPCs) from 1984 to 2000 to examine the dynamic relationships between growth of external debts with other determinant variables (exchange rate, interest payment on debt, and non-interest current account balance) and control variables such as governance indicators. The fixed- and random-effect models were used to investigate these relationships. First, the results show that high interest payments have adverse effects on the growth of external debts. Second, real exchange rates have positive influence on growth of external debts. Third, corruption is found to distort economic growth and reduces the efficiency of the public sector. Finally, stability index contributes negatively to the growth of external debts. Therefore, given these dynamic relationships; this study suggests that there are strong correlation between growth of external debts and exchange rate policy, interest payments and some governance indicators. This evidence may partially explain the explosive external debt position of the HIPCs.*

## INTRODUCTION

The world witnessed unprecedented explosion in public debt throughout the 1980s and the 1990s in developing countries, especially those of the Heavily Indebted Poor Countries (HIPCs). Most of the public debt holdings of developing countries are external debts. In most of these countries the share of debt in gross domestic product grew over time (see Figures 1 and 2). In fact, most of these countries face external debt that is more than two times the size of their gross domestic product. Due to scarce foreign exchange in most of these countries, efforts to service the debt consumed large shares of their government revenues. As the debt burden increases, these countries must allocate a greater portion of their revenues to service external debts, resulting in higher taxes, more borrowing, and eventually debt default.

The severe difficulties that most HIPCs faced in servicing their external debts resulted in the persistent accumulation of arrears, which are unpaid debt service obligations. Despite several repeated attempts at rescheduling, many HIPCs have not been able to meet their debt service obligations fully and on time for several years.

The worldwide economic growth slowdown has resulted in an increase in the level of debt burden, especially in the 1980s and 1990s (Easterly, 2001). This is partly because these countries have low incomes and their economies tend to grow slower than those of the higher income countries. Slower economic growth poses problems in expanding exports and delays progress in debt restructuring. This, in turn, impedes flows of capital to HIPCs. The massive external debts of these countries have reduced the inflows of foreign direct investment, employment, and growth of their economies and therefore have become a stumbling block to sustainable development.

In light of the above, this paper attempts to address the primary questions including: What are the factors behind the growth of external debts of the HIPCs? What are the consequences of massive external debts for these countries? What are the correlating effects within the factors themselves, so as to determine future patterns?

## LITERATURE REVIEW

Over the years, the issue of public debt has occupied primary importance in both local and international arenas. Claessen, et al (1997) argued that HIPCs are characterized not only by high debt relative to income, but also by relatively poor economic performance. The reason is the combination effect of the large inflows of concessional finance despite the emerging debt burden and low growth rates of output and exports. In addition, the poor economic performance in these countries could be attributed to adverse terms of trade development, civil and political unrest, weak macroeconomic management, and inefficient allocation of resources.

The most recent article by Easterly (2001) confirmed that the slowing down of economic growth in the past decades since 1975 can be attributed to the increases in the burden of public debts in most middle income countries and HIPCs. In the case of HIPCs, Easterly (2001) found that the public debt burden was worse than other lower income countries due to their slow economic growth after 1975 compared to their counterparts as a result of their weak policies. Elbadawi, Ndulu, and Ndungu (1997) found that while current debt inflows enhanced economic growth, past debt accumulation, which was viewed as a proxy for debt overhang had a negative impact on economic growth. They argued that if the accumulation of past external debts reached a certain critical level, it would actually discourage investment and retard economic growth. The authors also confirmed that the liquidity constraints caused by rising external debt servicing payments reduced exports and thus hampered economic growth. Ajayi (1997) analyzed the correlation between external debt and capital flight in the HIPCs and found that the building up of excessive external debts would

encourage capital flight. Capital flight, he argued, resulted in increased demand for external debts to fill the domestic investment needs. In addition, capital flight reduces growth, erodes the tax base, worsens income distribution, and reduces debt-servicing capacity by diverting domestic savings from investment.

de Larosiere (1984) found that the growth of external debt in most developing countries are attributable to their fiscal imbalances. In order to finance the deficit, these countries needed to increase taxes while at the same time reduce the non-interest expenditures. The two policies, however, are uncommon for these countries both because they are politically difficult to implement.

## MODEL AND METHODOLOGY

In order to determine the factors that cause the growth of external debts, consider the following expression:

$$GEDBT = \alpha + \beta_1 NICA + \beta_2 IPED + \beta_3 RER + \mu \quad (1)$$

where,

*GEDBT* = *growth of external debt to GDP*
*NICA* = *non-interest current accounts*
*IPED* = *interest payments on external debts*
*RER* = *real exchange rates*
$\mu$ = *the error term*

In equation (1) the growth of external debts is regressed on non-interest current accounts, interest payments on external debts, exchange rates. The expected signs of the explanatory variables in relation to their effects on growth of external debts are presented in Table 1.

**Table 1: Expected Signs of the Explanatory Variables**

| | BQI | COR | RER | GSI | ICI | IPED | NICA |
|---|---|---|---|---|---|---|---|
| Equation (1) | | | + | | | - | - |
| Equation (2) | | + | + | | | - | - |
| Equation (2a) | - | + | + | - | + | - | - |

BQI = Bureaucracy quality index, COR = Corruption index, GEDBT = Growth of external debts/GDP, RER = Real exchange rates, GSI = Government stability index, ICI = Internal conflict index, IP = Interest payments on external debts/GDP, and NICA = Non-interest current account balance.

**Control Variables**

In addition to corruption index, this study uses governance indicators such as, internal conflict index, government instability index, and bureaucracy quality index as control variables. These control variables are included in this study because they are likely to affect the growth of external debts. For example, corruption has implications for the composition of government expenditures. Corrupt government officials try to channel public funds to finance their personal ventures. Such diversion of resources public funds to personal use negates economic growth. The coefficients of corruption index and bureaucracy quality is expected to be positive, while the coefficients of internal conflict and government stability are predicted to be negative. Equation (1) can be rewritten to include the governance indicators as follows:

$$GEDBT = \alpha + \beta_1 NICA + \beta_2 IPED + \beta_3 RER + \beta_4 COR + \mu \quad (2)$$

$$GEDBT = \alpha + \beta_1 NICA + \beta_2 IPED + \beta_3 RER + \beta_4 COR + \beta_5 GI + \mu \quad (2a)$$

where,

*GI = Governance indicators*
*COR = Corruption index*

In equation (2) the growth of external debts is regressed on non-interest current accounts, interest payments on external debts, exchange rates and corruption index. In equation (2a) growth in external debts is regressed on non-interest current accounts, interest payments on external debts, real exchange rate, corruption index, and governance indicators. The expected effects of these variables on the growth of external debts are as follows:

Equations (1) through (2a) are estimated via the fixed- and random-effect. Fixed-effects model is used in order to allow the countries to have different intercepts that may be correlated with the regressors. The models are based on the following equation:

$$Y_{it} = \chi'_{it}\gamma_{it} + \mu it \quad (3)$$

where Y represents the dependent variable (Growth of External Debt), $\chi'$ is a vector of explanatory variables, i stands for the countries in the sample ( i= 1, 2, 3, 4, ….,29), t is the period under investigation (t = 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991,……2000) and $\mu_{it}$ is the error term. From equation (3) we derive the fixed effects model in terms of the notations used in the study as follows:

$$GEDBT_{it} = \beta_1 NICAS_{it} + \beta_2 IPED_{it} + \beta_3 RER_{it} + \beta_4 GI_{it} + \alpha_i + \delta_i + \mu_{it} \quad (4)$$

where GEDBT represents growth of external debt, NICA stands for non-interest current account balance, IPED, RER, and GI as explained, while μ is the error term. In equation (4), $\alpha_i$ captures unobserved country-specific effects assumed fixed over time. The year-effects represented by $\delta_i$ are included to account for shocks that are common to all countries in the sample, such as rapid population, slow economic growth, and imperfect capital markets.

From equation (3), we again generate the random effects model as follows:

$$GEDBT_{it} = \beta_1 NICA_{it}\gamma_i + \beta_2 IPED_{it}\gamma_i + \beta_3 RER_{it}\gamma_i + \beta_4 GI_{it}\gamma_i + \delta + \mu_{it}\ , \quad \gamma_i = \bar{\gamma} + \hbar_i \quad (5)$$

where μ is the error term, $\hbar_i$ stands for random country effect while $\bar{\gamma}$ represents the mean of the coefficient vector. Under the random effects model, the slope coefficients are allowed to vary randomly across countries

Most of the previous country-studies applied the standard OLS procedure to examine the determinant of the growth of external public debts. These studies assumed that the omitted variables are independent of the explanatory variables and are independently, identically distributed. This assumption however leads to biased inferences especially when country-specific features such as policy changes. Hsiao (1986) points out that the OLS procedure yields biased and inconsistent estimates when the omitted country-specific variables are correlated with the explanatory variables.

The panel data approach provides avenues through which the country-specific characteristics (whether observed or unobserved) can be incorporated into cross-country studies to avoid biases resulting from the omission of relevant variables. The fixed-effect procedure yields unbiased and consistent estimates when the omitted country-specific variables are correlated with the explanatory variables. One of the shortcomings of the fixed-effects framework is that it assumes that differences across countries represent shift in the regression equation. This assumption implies that the fixed-effects model is appropriate when the entire population rather than the sample is investigated. However the random-effects model is applied when a sample rather the population is considered. The random-effects model is not without flaws. It yields biased regression estimates if the omitted country-specific variables are correlated with the explanatory variables. This study considers both the fixed-effect and random-effect procedures given the weaknesses associated with each of the models. Furthermore, our sample (25 countries) is large enough to warrant the application of both approaches.

## DATA AND EMPIRICAL RESULTS

The data on external debts, non-interest current account, and interest payments on external debts were taken from the *Global Development Finance* published by the World Bank. The governance indicators were obtained from the *International Country Risk Guide*. The exchange rate data were obtained from the *International Financial Statistics* 2003 CD Rom version published by International Monetary Fund (IMF). The list of HIPCs consists of 29 countries including Angola, Burkina Faso, Cameroon, Congo, Democratic Republic, Congo Republic, Cote D Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Guyana, Honduras, Kenya, Liberia, Madagascar, Malawi, Mali, Mozambique, Nicaragua, Niger, Senegal, Sierra Leone, Sudan, Tanzania, Togo, Uganda, Vietnam, and Zambia. The range of the study is from 1984 to 2000.

Table 2 displays the summary statistics for bureaucracy quality index (BQI), corruption index (COR), growth of external debt (GEDBT), real exchange rate (RER), government stability index GSI), internal conflict index (ICI), interest payment ratio of GDP (IPED), and current account deficits (NICA). The mean values for BQI, COR, GEDBT, RER, GSI, ICI, IPED, and NICA are 1.16, 2.58, 144.73, 1201.13, 6.22, 6.68, 0.10, and -0.32, respectively. The maximum and minimum values show cross-country variability among the variables used in the study. The standard deviations indicate that exchange rates fluctuated the most for the period under investigation.

**Table 2: Summary Statistics**

| | BQI | COR | GEDBT | RER | GSI | ICI | IPED | NICA |
|---|---|---|---|---|---|---|---|---|
| Mean | 1.16 | 2.58 | 144.73 | 1201.13 | 6.22 | 6.68 | 0.10 | -0.32 |
| Median | 1.00 | 3.00 | 113.00 | 364.84 | 6.00 | 7.00 | 0.05 | -0.23 |
| Maximum | 3.00 | 5.00 | 1064.00 | 22332.50 | 11.00 | 12.00 | 0.79 | 3.27 |
| Minimum | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | -2.59 |
| Std. Dev. | 0.89 | 1.13 | 115.48 | 3244.07 | 2.44 | 2.57 | 0.13 | 0.40 |
| Skewness | 0.50 | -0.38 | 3.26 | 4.30 | 0.31 | -0.22 | 2.70 | -0.11 |
| Kurtosis | 2.59 | 2.87 | 19.23 | 21.62 | 2.41 | 2.59 | 11.91 | 20.28 |
| Jarque-Bera | 23.54 | 11.98 | 6285.07 | 8638.11 | 15.08 | 7.46 | 2229.43 | 6137.60 |
| Probability | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 |
| Observations | 493.00 | 493.00 | 493.00 | 493.00 | 49300 | 493.00 | 493.00 | 493.00 |

BQI = Bureaucracy quality index, COR = Corruption index, GEDBT = Growth of external debts/GDP, RER = Real exchange rates, GSI = Government stability index, ICI = Internal conflict index, IP = Interest payments on external debts/GDP, and NICA = Non-interest current account balance

Table 3 presents the bivariate correlations between growth of external debts, exchange rates, interest payments on external debts, non-interest current account, and governance indicators. From Table 3, it can be seen that growth of external debts are negatively correlated with non-interest current account, interest payments, corruption index, internal conflict index, government stability index, and bureaucracy quality index. However, growth of external debts and real exchange are positively correlated. Furthermore, the results show that non-interest current account, interest payments, corruption index, internal conflict index, government stability index, and bureaucracy index are positively correlated with each other.

**Table 3: Correlation Matrix**

| | BQI | COR | GEDBT | RER | GSI | ICI | IPED | NICA |
|---|---|---|---|---|---|---|---|---|
| BQI | 1.00 | | | | | | | |
| COR | 0.33 | 1.00 | | | | | | |
| GED BT | -0.07 | 0.13 | 1.00 | | | | | |
| RER | 0.08 | 0.15 | 0.05 | 1.00 | | | | |
| GSI | 0.15 | 0.09 | -0.12 | 0.20 | 1.00 | | | |
| ICI | 0.27 | 0.20 | -0.10 | 0.25 | 0.37 | 1.00 | | |
| IPED | 0.38 | 0.06 | -0.08 | 0.06 | 0.07 | 0.27 | 1.00 | |
| NICA | -0.01 | -0.03 | -0.07 | -0.17 | -0.03 | 0.06 | -0.09 | 1.00 |

BQI = Bureaucracy quality index, COR = Corruption index, GEDBT = Growth of external debts/GDP, RER = Real exchange rates, GSI = Government stability index, ICI = Internal conflict index, IP = Interest payments on external debts/GDP, and NICA = Non-interest current account balance

Table 4 displays the results from the fixed and random effect models in conjunction with the associated test statistics. The explanatory variables are exchange rates, non-interest current accounts, interest payments on external debts, several governance indicators, and corruption index. All the t-statistics are given in parenthesis. The results from the fixed and random effect models for without governance indicators and corruption index are presented in column A of Table 4. The results from both the fixed and random effect models reveal that interest payments have significantly negative effect on the growth of external debts. Exchange rates are found to have significant influence on growth of external debts. Column B of Table 4 presents the results from both the fixed and random effect models with corruption index included as an additional explanatory variable. Again, the results reveal that interest payments have negative influence on growth of external debts. Exchange rates are found to affect growth of external debts positively. Interestingly, the results reveal that corruption engenders growth of external debts for the sample countries for the time period under

investigation. The regression coefficient on corruption index is statistically significant at the 10 percent level. The regression coefficients on exchange rates and interest payments on external debts in Columns A and B are statistically significant at the 1 and 5 percent levels, respectively. The exchange rates and interest payments on external debts have the expected signs. The magnitudes of all significant variables are reasonable. The finding that interest payments have negative influence on growth of external debts suggests that high interest payments discourage foreign loans. However, it is important to point out that contrary to the conventional wisdom, some of the HIPCs have been able to increase their external debts through debt rescheduling and restructuring, irrespective of the level of interest payments.

**Table 4: Dependent Variable: Growth of External Debts**

| | Without Governance Indicators | | With Corruption only | | With All Governance Indicators | |
|---|---|---|---|---|---|---|
| Independent Variables | Fixed Effects | Random Effects | Fixed Effects | Random Effects | Fixed Effects | Random Effects |
| Constant | 149.85*** | 148.81*** | 128.00*** | 126.57*** | 171.37*** | 168.99*** |
| | (19.66) | (7.67) | (9.09) | (5.61) | (9.02) | (6.51) |
| Interest Payments on External Debts | -139.17** | -127.56** | -132.60** | -122.30** | -146.53** | -130.93** |
| | (2.29) | (2.25) | (2.18) | (2.16) | (2.18) | (2.10) |
| Exchange Rates | 0.01*** | 0.01*** | 0.01*** | 0.01*** | 0.01*** | 0.01*** |
| | (4.30) | (4.16) | (4.30) | (4.15) | (5.02) | (4.87) |
| Non-Interest Current Account Balance | -3.07 | -3.96 | -2.83 | -3.66 | -3.37 | -4.16 |
| | (0.31) | (0.40) | (0.29) | (0.38) | (0.34) | (0.43) |
| Internal Conflict Index | - | - | - | - | -2.51 | -2.52 |
| | | | | | (1.29) | (1.32) |
| Corruption Index | - | - | 8.24* | 8.48* | 5.22* | 5.82* |
| | | | (1.84) | (1.94) | (1.90) | (1.98) |
| Government Stability Index | - | - | - | - | -4.02** | -4.00** |
| | | | (2.61) | (2.62) | | |
| Bureaucracy Quality Index | - | - | - | - | 4.98 | 4.08 |
| | | | | | (0.88) | (0.73) |
| Adjusted R-Square | 0.043 | 0.043 | 0.050 | 0.050 | 0.08 | 0.08 |
| Number of Observations | 493 | 493 | 493 | 493 | 493 | 493 |

Note: Absolute value of robust t -statistics are in parentheses; * significant at 10%; ** significant at 5%; and *** significant at 1%

The results from the fixed- and random-effect models with all governance indicators are presented in Column C of Table 4. The results from both procedures indicate that interest payments have significant adverse effects on the growth of external debts at the 5 percent significance level. However, non-interest current account deficits have no significant effects on growth of external debt for 29 HIPCs from 1984 to 2000. Interest payments, exchange rates and government stability index have significant effects on growth of external debts. Government stability index contributed negatively to the growth of external debt and is statistically significant at the 10 percent level. This result indicates that instability is associated with external debt problems. In other words, the less stable a country is, the more it encounters debt problems.

What is striking about these results is that when only corruption index was included in the model, it turned out the corruption played a positive role in determining the growth of external debts. It is important to point out that our prediction relative to effect of corruption on the growth of external debts was confirmed since the regression coefficient on corruption index has the expected sign. It is logical to say that corruption distorts economic growth and reduces the efficiency of government. Inefficiency in the public sector spurred by corruption leads to increase in demand for foreign loans at higher interest rates. In this particular study, we can conclude that as a country experiences less and less corruption, fewer funds are needed to supplement the loss of money as result of corruptions. On the contrary, one can also argue that activities associated with corruption can result in lack of trust in the eyes of international community. Lack of trust will reduce the inflow of foreign capital. Therefore, the less corrupt a country is, the easier it is for it to obtain external funds. The acquisition of additional foreign loans will increase the country's external debts to GDP ratio. Both arguments are quite valid depending on the credibility of the particular country under study.

It is interesting to note that the contributions of interest payment and exchange rate variables and signs remained relatively the same for with and without governance indicators as can be seen in Columns A through C of Table 4. Only non-interest current accounts balance really did not contribute to the growth of external debts. The regression sign on non-interest current accounts did not change in all three estimations and it is statistically insignificant in all of the cases. We have to be mindful of the fact that there has been an upward trend in the current account deficits for the HIPCs as a result of fluctuations in commodity prices. Fluctuations in commodity prices adversely affect the extent to which the HIPCs depend on foreign capital. However, given that the regression coefficient on non-interest current accounts is statistical insignificant in all cases, its contribution to the growth of external debts can be described at best, as marginal.

The regression coefficients on exchange rates and interest payments on external debts turned out as expected and statistically significant in all of the cases. This relationship is quite robust and obvious since most of the HIPCs followed aggressive exchange rate policies, which led to increases in devaluation of local currencies in terms of purchasing power parity. Inefficient exchange rate

policies pursued by most of the HIPCs caused the ratio of debt to GDP to increase as a result of capital loss.

The results from the fixed- and random-effect models with all governance indicators are presented in Column C of Table 4. The results reveal that most of the governance indicators have insignificant effects on growth of external debts. In short, only government stability index significantly contributed to the growth of external debts. As expected, the regression coefficient on government stability index is negative. This result implies that the more stable a country is, the less it relies on foreign loans. Interestingly, all of the regression coefficients on the governance indicators exhibited the expected signs. Internal conflict and bureaucracy quality indexes appear not to have implications for growth of external debts, as they are statistically insignificant at the conventional levels. However, it is important to point out that most of the countries in this classification (HIPCs) are plagued with internal conflicts. Most of these countries divert substantial resources and political attention from economic, financial, and social programs to internal conflicts. The reallocation of resources in favor of internal conflicts has a negative effect on economic development, as important parts of the productive infrastructure are either neglected or destroyed due to internal strife.

## CONCLUSIONS AND POLICY RECOMMENDATIONS

High external debts can erode confidence in economic reforms and thus diminish the sustainability of what might be an otherwise sound economic reform strategy. Massive external debts can have indirect negative consequences on governments in terms of public support insofar as debts are perceived to contribute to poor growth and poor policies. This paper attempted to ascertain the determinants of the growth of external debts. The study uses panel data for 29 HIPCs from 1984 to 2000. The fixed- and random-effect models were used to investigate the relationships between growth of external debts, exchange rate, interest payments on external debts, and non-interest current account balance. The governance indicators including internal conflict index, government instability index, and bureaucracy quality index were used as control variables. The main results of the paper are interesting and intuitive.

Interest payments on debts and real exchange rates have significant effects on growth of external debts. Exchange rates exhibited the lowest regression coefficient but has the highest significant level amongst all explanatory variables. Surprisingly, non-interest current account balance, which was expected to be significant along with interest payments and exchange rates, proved otherwise. In terms of control variables, only one (i.e. government stability index) out of the four governance indicators has implications for growth of external debts.

In all, the results suggest that there are strong correlation between growth of external debts to GDP ratio, exchange rates, interest payments on external debts and some of the governance indicators namely - corruption and government stability indexes. The results have important implications for the HIPCs, especially as they struggle to map out strategies to curtail their reliance

on foreign capital and to avoid further debt-overhangs. The HIPCs should formulate strategies that will enable them to curtail their external debt burdens. The results of this study show that the increases in foreign debt burdens can be attributed to high debt service costs. The inability of the HIPCs to curb their external debt burdens can be blamed on exchange rate misalignments, rather than, the size of their current account deficits. The aggressive exchange rate policies pursued by the HIPCs actually weakened their currencies in terms of purchasing power parity. The implied capital loss due to worsening purchasing power parity exacerbates the external debt burdens of these countries. The HIPCs should confront the issue pertaining to corruption in their economies. They should develop policies designed to curtail wide spread corruptions in these countries. Above all, stable institutions and governance measures should be strongly encouraged, as these will enable the HIPCs to alleviate their external debt burdens.

It should be noted, however, that the economic and political situations of these countries make them a non-typical sub-sample. Further research is therefore necessary to provide a more definitive assessment of the relationship between growth of external debts and some of the variables used in this study.

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# A PREDICTIVE MODEL OF MUNIFICENCE FOR US MANUFACTURERS USING FDI AS AN INDICATOR OF GLOBALIZATION

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## ABSTRACT

*Industry's ability to produce consistent positive economic performance in the region it operates is critical for a successful economy. Globalization introduces competition to regional industries that now compete worldwide for capital, which is used to produce economic output and jobs. US based jobs and wealth are being lost to offshore manufacturers through the globalization process, which in turn has a significant economic and political impact. Therefore globalization needs to be researched empirically to support better economic and financial decisions which are influenced by this force.*

*Foreign direct investment (FDI) is an excellent measurement or proxy for many aspects of globalization. Munificence is a well-researched industry task environment dimension. This project presents a model demonstrating that foreign direct investment (FDI) as a measure of globalization is a significant predictor of munificence for manufacturers in the USA. The featured model is useful to economists and development planners because it begins to build empirical data for FDI as a predictive indicator of economic activity for manufacturers. To date most of the literature studying FDI evaluates it as a dependent variable and typically analyzes what factors attract FDI. While this is important it is not the only useful way to study FDI.*

## INTRODUCTION

Globalization is a significant economic force that must be better understood by contemporary stakeholders of business. Economic policy makers and investors must effectively anticipate the impact of globalization to their areas of responsibility or expose these interests to great risk. Offshoring of white collar jobs and the loss of manufacturing jobs to countries able to produce at a lower cost are real life examples of this risk.

Foreign Direct Investment (FDI) is an excellent quantitative indicator of activity related to globalization and economic development. FDI is a variable that measures an important aspect of globalization processes, i.e. the economic integration of activities performed in different regions of

the world. (World Bank, 2005) FDI has been used in a wide variety of economic development research studies. Empirical FDI research has been shown to have a casual relationship to transaction costs in Dunning's Eclectic Model (Dunning,1976), to value chains (Melitz, Helpman, Yeaple, 2003), and to product cycles (Vernon, 1966).

However little research exists demonstrating the effect of FDI on the so-called business task environment in mature economies. Recently Jiang and Beamish build the case for more research in this area. "Research on determinants of FDI and outcomes of internationalization has greatly enhanced our understanding of MNEs. In comparison, the question of how firms actually expand and profit in foreign markets receives limited attention. One reason might be that strategic management research has placed more emphasis on content-based rather than process based strategic features. Another reason might be the lack of longitudinal data that are needed for studying the foreign expansion process." (Jiang and Baemish, 2004)

The purposed model begins to fill the research void of foreign ownership research. We do this from an industry sector perspective using the so-called business task environment. A second important objective of this model is to extend the academic literature on FDI as an empirical measure of globalization and it's impact on the economy.

Dess and Beard narrowed the scope of the literature on the business task environment and establish environmental dynamism, munificence, and complexity as the key dimensions recognized by researchers for capturing operating environment and risk for business (Dess, Beard, 1984). Recently, these dimensions have been recognized in the literature as factors affecting a firms ability to innovate. (Modarres, Beheshtian, Ispahani, 2003).

Munificence is closely associated with sustained sales growth in an industry or business sector. A less researched but often stated description of munificence is the word slack, used in terms of ability to withstand or be resilient during temporary negative economic periods. This paper demonstrates the influence and predictive value FDI has on munificence. More specifically we formulate and empirically test the predictive value of FDI on munificence for US manufacturing sectors.

If FDI can be repeatedly shown to be a strong predictor of munificence than it is likely that it could be used by economists, economic planners to refine predictions on the future availability of manufacturing jobs and tax revenues from manufacturing in the medium time horizon. Alternatively the model can be used by industry executives to better evaluate investment risk.

The body of literature contributing to this model falls into two categories. The categories are economic research on FDI and strategic management research on the task environment of business. This review will be organized into to two primary sections discussing the respective bodies of theoretical and empirical literature. These sections will be followed by a brief discussion on how bridging the relationship of these research bodies adds to the literature.

Almost all research models studying FDI acknowledge the pursuit of competitive advantage as the valuable asset the investing entity seeks to secure. This competitive advantage can come in

the form of efficiencies as proposed in Dunning's eclectic model (Dunning, 1976) and it's extensions. It can be in the form of pure knowledge acquisition via technology transfers. (Love, 2003) Alternatively it can come from the exploitation of the product life cycle. (Vernon, 1966)

Most recently an eclectic approach has gained favor in the literature. Though the theories of FDI are gradually converging, it is important to point out that the nature of FDI is such that different research problems studied may require completely different approaches to analyze FDI behavior. For this reason our research model is not based on any specific FDI theory rather the concept that there are consistent and generalizable factors driving FDI activity which in turn effect the competitiveness of firms.

Within a country the factors effecting FDI will tend to move in the same general direction to yield a significant predictive value from FDI upon the business environment of a selected sector within a selected country. This is not likely to be true between like sectors in different countries due to known FDI influencing factors such as tax rate, intellectual property right protection, currency fluctuations, regulations, country risk and relative fluidity of capital entry and exit.

The Dunning Eclectic Model for FDI is probably the most quoted FDI theory. It has evolved over the past 30 years and still is a significant contributor to modern FDI theory. This theory is also commonly referred to as the eclectic OLI paradigm or model. As Dunning states the OLI acronym represents "ownership, location and internalisation (OLI) as a tripod explaining the scope and geography of value added activities by multinational enterprises (MNEs). (Dunning, 2001)

Following several decades of metamorphosis Dunning's Model has been refined to reflect changing business conditions influencing the use of FDI. "A series of events over the last two decades has led several scholars to suggest that the world is moving to embrace a new trajectory of market capitalism. This has been variously described as alliance, relational, collective, associate and the 'new' capitalism". (Dunning, 1995). This new capitalism is characterized by a variety of collaborative arrangements between companies. Some include direct investment while others involve contracts, licenses and inter firm partnerships. While the forms are different depending on the financial objectives, FDI is still influenced either positively or negatively by them. Therefore FDI continues to be supported in terms of its casual relationship to strategic MNE activity in the context of this model.

Much of the discussion of ownership advantage is contemplated in terms of technology and/or management expertise, therefore a strong a priori assumption exists that FDI will be an important method by which technology is transferred internationally from home to host countries. "However, recent theoretical work has given renewed impetus to something long recognized in the literature, that a possible motive for FDI is not to exploit proprietary technology, but to access it: thus technology sourcing may be the motive for FDI." (Love, 2003)

Based on established interrelationships between innovation and FDI vis-à-vis technology transfer motives (Love, 2003) and product cycle motives (Vernon 1966), and the implied connection

of access to better technology in the Dunning Eclectic models (1976, 1995, 2001) it is easy to make a theoretical case for a casual relationship between FDI level and innovation.

With the theoretical legitimacy of FDI well-established as an economic factor we then look to organizational behavior literature for valid business environment dimensions as dependent variables. The seminal work on the task environment of firms is Dess and Beard (1984), which narrowed environmental dimensions to the following three; environmental dynamism, munificence, and complexity. This work was extended by (Keats & Hitt, 1988), by (Sharfmann & Dean, 1991) and others.

Keats and Hitt studied US manufacturers and developed "an interactive model of relationships among environmental dimensions, diversification strategy, firm size, structural divisionalization, and economic performance." (Keats, Hitt, 1998) "On the basis of a comprehensive review of the literature Aldrich (1979) developed a scheme of six environmental dimensions on which there is an "emerging consensus of researchers" (Dess & Beard, 1984). Dess and Beard used a factor analysis to collapse five of the six dimensions into a more parsimonious set of three: munificence, dynamism, and complexity.

Sharfmann and Dean offer a well-organized overview of the major research literature categorizations of the environmental dimensions of business up to 1991 in Table 1.

**Table 1: Conceptualization of the Environment**

| Major Works Environments | Complexity | Dynamism and Stability | Resource Availability |
|---|---|---|---|
| March and Simon (1958) | | | Munificence |
| Emery and Trist (1965) | Complexity Routineity | Instability | |
| Thompson (1967) | Heterogeniety | Dynamism | |
| Child (1972) | Complexity | Stability | |
| Minzberg (1979) | Complexity Diversity | Stability | Illiberality |
| Aldrich (1979) | Concentration Heterogeniety | Turbulence | Capacity Consensus |
| Tung (1979) | Complexity Routineity | Instability | |
| Dess and Beard (1984) | Complexity | Dynamism | Munificence |

This table makes it visually clear there was an active body of research over a 30 year period which appeared to come to a critical juncture with the Dess and Beard factor analysis in 1984. The research did not end there, rather it converged to a point where these dimensions could be extended

and viewed in context with other observations researchers were making in regard to the task environment of business. The extensions of this body of research includes but is not limited to Castrogiovanni (1991) Anderson and Tushman (2001), Mingfang and Simerly (2002), and Rasheed (2005).

By bridging the theory developed in the research community studying FDI and the management theory addressing the business task environment we hope to add to the literature. Using the premise that FDI is a strong economic indicator of globalization we develop a model to predict the performance of the task environment of business using FDI as the dependent variable. Although this concept may seem intuitive, it warrants pedantic research to establish quantitative support. This concept is demonstrated using a hierarchical regression demonstrating a correlation between FDI and munificence for US based manufacturers.

## RESEARCH QUESTION AND HYPOTHESIS

1. *Does FDI predict the degree of munificence at the industry level for manufacturing firms in the USA? If so, in what direction?*

The hypotheses for this research project is that globalization can effect international capital flows and FDI is an economic indicator of globalization that can be shown to influence the operating environment of business. Industry and business sector as defined herein are the set of companies making up a NAICS code. This hypothesis will be tested in the proposed regression model.

## METHODS

The Merriam-Webster's Dictionary main entry for globalization is globalize. "In the transitive verb form the word takes the forms globalized or globalizing **:** to make global; *especially* **:** to make worldwide in scope or application." (Webster, 2005) We use the noun form of globalization in this research.

The BEA definition of a "U.S. affiliate" is a key measure of FDI used by this agency for government research. BEA definition of a "U.S. affiliate is materially similar to The OECD definition of (FDI) as both require an ownership of at least 10% and imply that the direct investor is able to influence or participate in the management of an enterprise; but does not require absolute control by the foreign investor." We will use the BEA definition of a "U.S. affiliate" is this project because the data for analysis is readily available at the BEA website.

Variable 1 is FDI data selected for the year 1999 with the intention of selecting a FDI position two years prior to 2001 to demonstrate the predictive power of FDI our independent variable to our dependent variable munificence.

Variable 2 munificence is operationalized for this analysis using the Sharfman and Dean method of calculating munificence or more specifically value of shipments munificence (VSM) by

dividing the regression slope of the value of shipments over the period by the mean of the value of the shipments over the same period. All sales data was obtained from the US Department of Commerce International Trade Administration (ITA) website for the years 1997-2001 (ITA, 2005). All the data was adjusted to 1999 dollars.

The sample is a population of 51 manufacturing sectors by NAICS code grouped at the four-digit level. All codes were in the range of 31-33 which is the NAICS definition of manufacturer. This group represented all the data available to the public from the years 1997 to 2001 that also had corresponding BEA historical FDI data reported at the four digit NAICS code sector level for the same years. The years 1997-2001 were selected because these were the first years following the BEA conversion from SIC to NAICS sector reporting conventions. The model controls for average sales per employee to account for the influence of so-called gazelle companies (companies with annual sales revenue growth 20 percent or more for four straight years) as a share of total employment (PPI, 2005). Companies in this category are highly munificent by definition.

Our theoretical concept and the hypothesis following this logic contemplates that the level of munificence will be correlated to the amount of FDI in prior periods. To test this hypothesis the level of munificence was calculated for the years in question for each NAICS code using the Sharfman & Dean method. In order to do this the standard error and mean were calculated for each NAICS group.

Outliers were identified by removed using a residual analysis method for appropriateness of fit into the model. Standardized dfbeta's were calculated for each case and cases with an absolute vale of greater than 2/Sqrt(n) were considered outliers. In this test |.28| was the standardized dfbeta outlier identification criteria and such cases were identified. Industry cases in the following four NAICS codes (3251,3341, 3342 and 3361) were deselected based on this process. At this point the munificence calculation was entered into the regression input file.

**Descriptive Statistics**

| | Mean | Std Deviation | N |
|---|---|---|---|
| munificence | ***** | .070014873 | 47 |
| avgsaleperemp | 299.1011 | 212.1795 | 47 |
| FDI | 3976.94 | 6902.399 | 47 |

To test our hypothesis empirically we employed a hierarchical regression method, which is a common approach in management literature. The first level of the hierarchy was a regression controlling for industries with significant deviations in annual sales per employee as stated previously. The descriptive statistics are presented below and the regression results are on the following pages.

**Coefficient[a]**

| Model | | Unstandardized | | Standardized | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std Error | Beta | | |
| 1 | (Constant) | .017 | .006 | -.351 | 2.695 | .010 |
| | avgsaleperemp | .000 | .000 | -2.516 | .015 | |
| 2 | (Constant) | .013 | .006 | | 2.024 | .049 |
| | avgsaleperemp | .000 | .000 | -.367 | -2.772 | .008 |
| | FDI | .000 | .000 | .329 | 2.486 | .017 |

[a] Dependent variable: munificence

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std Error of the Estimate |
|---|---|---|---|---|
| 1 | .351[a] | .123 | .104 | .0255608226 |
| 2 | .481[b] | .231 | .196 | .0242056734 |

[a] Predictors in the Model: (Constant), avgsaleperemp
[b] Predictors: (Constant), avgsaleperemp, FDI

**ANOVA[c]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | .004 | 1 | .004 | 6.331 | .015[a] |
| | Residual | .029 | 45 | .001 | | |
| | Total | .034 | 46 | | | |
| 2 | Regression | .008 | 2 | .004 | 6.620 | .003[b] |
| | Residual | .026 | 44 | .001 | | |
| | Total | .034 | 46 | | | |

[a] Predictors: (Constant), avgsalesperemp
[b] Predictors: (Constant), avgsalesperemp, FDI
[c]. Dependent Variable: munificence

| Excluded Variables[b] | | | | | |
|---|---|---|---|---|---|
| Model | Beta Intolerance | t | Sig. | Partial Correlation | Collinearity Statistics |
| 1 FDI | .329[a] | 2.486 | .017 | .351 | .992 |

[a] Predictors in the Model: (Constant), avg sale per emp
[b] Dependent Variable: munificence

## REGRESSION RESULTS

The model summary provides a coefficient of determination offering a favorable variance in our selected dependent variable. The ANOVA significance level of .017 lends additional support to our model with a confidence level below .05. The model shows a .329 correlation coefficient for FDI. The adjusted R square of .196 in the model summary demonstrates the relative predictive strength of FDI on environmental dynamism for the tested population.

## SUMMARY

The implication of this model is that FDI has a greater than 14% correlation to the dimension of munificence for manufacturers in the USA. FDI can therefore be considered for use as a predictive indicator of munificence. This warrants further investigation on the relationship of FDI to munificence both with additional controls and against expanded data sets where available. It also sets the stage for similar research measuring the casual relationship between FDI and other dimensions of the business task environment such as environmental dynamism.

A second stated purpose of this research was to provide additional support for FDI as an empirical indicator of globalization and it's impact on the economy. By demonstrating the correlation between FDI and the business task environment we demonstrate quantitatively a way globalization relates to the business environment from a new perspective.

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# RECENT CHANGES IN MAJOR EUROPEAN STOCK MARKET LINKAGES

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## ABSTRACT

*The gradual lifting of restrictions on capital movements and the relaxation of exchange controls in recent years have led to a substantial increase in international stock market activities. Due to several recent developments, many experts suggest that stock markets have moved toward a far greater degree of global integration, which has led to a renewed interest in the efficiency of international financial markets. This paper examines the extent to which the linkages of the twelve largest European stock markets have changed over the last decade. The findings suggest the presence of distinct systematic relationships among these stock markets. Such relationships, typical of the existence of overall market efficiency, make it more difficult for investors to generate abnormal rates of return in these markets.*

## INTRODUCTION

Recent developments in financial market deregulation, the gradual lifting of restrictions on capital movements, the relaxation of exchange controls, major progress in computer technology and telecommunications, as well as a significant increase in the cross-listings of multinational company stocks have led to a substantial increase in international stock market activities. Also, more recent improvements in communication and computer technology not only have made the flow of international information cheaper and more reliable, but also have lowered the cost of international financial transactions. In addition, greater coordination in trade and capital flows policies among the industrialized nations may have contributed to more similar economic conditions and developments in these countries, which would be reflected in their respective stock markets. Largely as a result of these developments, many experts suggest that, especially in recent years, stock markets have moved toward a far greater degree of global integration which has led to a renewed interest in the efficiency of foreign financial markets. Since market efficiency requires stock prices to react quickly not only to information pertaining to the domestic economy, but also to international conditions as well, systematic relationships among stock markets in different countries should exist as long as financial markets respond efficiently to external forces.

Most research on global market efficiency has dealt with the systematic movements of stock prices, the lead-lag relationship among market indices, and the benefits of diversification (for examples, see Chan et al, 1997; Yang et al.,.2003; Agmon, 1972; Grubel and Fadner, 1968; Haney and Lloyd, 1978; Maldonado and Saunders, 1981; Panton et al., 1976; Stehle, 1977; and Watson, 1978). Several studies (e.g., Bessler and Yang, 2003, Sakar and Li, 2002; Hilliard, 1970; Panton et al. 1976; Ripley, 1973; and Robichek et al., 1972) examined the degree of association among global exchanges. Panton et al. (1976) conclude that there is some stability and structure in international markets, with some markets displaying a high degree of stability. Ripley (1973) on the other hand, reports that more than 50 percent of the movements in typical developed countries' indices is unique to the specific country. Also, Robichek *et al.* (1972) found a lack of a significant correlation between the stock returns of some countries.

Examining inter-country correlation coefficients over one-year, two-year, and four-year subperiods, Watson (1980) observed that, in general, inter-country correlation coefficients do not change significantly from one period to the other. The results of the above mentioned studies suggest that, for many countries, stock price movements have some correlation, but that most of the movements appear to be unique to a country.

Attempts by Agmon (1972) and Branch (1974) to detect lead-lag relationships among stock markets around the world led to the general conclusion that there is little or no interrelationship between different stock exchanges. Also, Schollhammer and Sand (1985) report that for the four largest stock markets in Europe (i.e., the United Kingdom, Germany, Switzerland, and France), no discernible patterns exist in aggregate stock price changes. For Italy and the Netherlands, however, stock price movements were found to deviate from a random walk process. Schollhammer and Sand suggest that the relative small size of these stock markets and the infrequent trading of many stocks constituting their respective national stock index may be possible reasons for those market inefficiencies. Nevertheless, these and other researchers do acknowledge the existence of some relationship between certain exchanges.

The informational efficiency of the United Kingdom, the United States, Canadian, and Japanese equity markets was examined by Kamarotou and O'Hanlon (1989). Although the results for three of these markets showed some resemblance, the United Kingdom pattern was opposite that of the other three.

Investigating the intercorrelation between Japanese and U.S. stock markets, Becker *et al.* (1990), observed that the S&P 500 returns during the previous day explain from 7 to 25 percent of the fluctuations in the Nikkei Index returns the next day. These results suggest that the U.S. market has a pronounced impact on the Japanese market, while, according to Eun and Resnick (1984), the opposite does not appear to be the case. However, any abnormal returns in Japan disappeared once transaction costs and transfer taxes were considered.

The possible benefits of international diversification were investigated in several studies (Adler and Dumas, 1975; Grubel, 1971; Lessard, 1976; Levy and Sarnat, 1970; Solnik, 1974; and

Stehle, 1977). The findings generally suggest that international diversification can reduce risk. For example, Solnik (1974) reports that the advantages of international diversification are reduced due to the possible imposition of exchange controls but that the risk of a portfolio protected against exchange risk is lower than that of an unhedged portfolio. He also concluded that multinational portfolios that outperformed any portfolio which relied solely on securities from one country could be constructed.

Other studies examining international stock market relationships in the 1980s include those by Eun and Shim (1989), Fisher and Palasvirta (1990), Hamao *et al.* (1990), and King and Wadhwani (1990). These studies identified consistent short-run relationships in stock prices among countries, with the U.S. leading other major stock markets.

While the results of the previous studies are useful for the conditions that prevailed during the time periods examined, none of the above studies provides a comprehensive and current examination of all the major European stock markets. With the evolution of the European Union and the significant growth and development in some of Europe's financial markets, a study of the linkages among the European stock markets is timely and relevant. To address this issue, this research investigates the co-movements over the last 25 years of the European stock indexes for which reliable information is available on a consistent basis. As such, this paper contributes to the existing literature by providing new evidence on the benefits of international diversification and the consistency of relationships between and among major European equity markets.

According to finance theory, a portfolio that is internationally diversified potentially contains less risk as compared to a purely domestic portfolio. However, the degree to which risk is reduced through diversification depends on the level of correlation of the securities in the portfolio. Clearly, the less international markets are correlated with each other, the greater the benefits of international diversification in the form of risk reduction.

Specifically, the purpose of this paper is to examine the possible relationships between and among the national stock indices representing the twelve European countries of Austria, Belgium, Denmark, France, Germany, Italy, the Netherlands, Norway, Spain, Sweden, Switzerland, and the United Kingdom. Also, these indices are compared with the "MSCI World Index" (representing over 93 percent of the world's stock markets) as compiled by *Morgan Stanley Capital International Perspective* (MSCI) of Geneva, Switzerland. Weekly data, starting with the first week of January 1980, and extending through the last week of June 2004, are used to test for any possible co-movements among these indices. Also, charts are used to compare the performance of the indices over the time spans examined. The information generated in this paper provides evidence on the changing relationship among the European stock markets. In the paper, some of the implications for financial market efficiency and international diversification are also discussed. The findings clearly reveal that while the trend toward greater integration of international financial markets continues, enough diversity still exists for investors to reap potentially significant benefits in the form of portfolio risk reduction.

## DATA AND METHODOLOGY

The sample used in this research consists of the weekly national stock indices of the twelve European countries of Austria, Belgium, Denmark, France, Germany, Italy, the Netherlands, Norway, Spain, Sweden, Switzerland, and the United Kingdom. Wednesdays' closing prices are used to determine the weekly returns. For comparison purposes, the MSCI World Index, measuring the market-weighted performance of securities listed on the stock exchanges of Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hong Kong, Ireland, Italy, Japan, the Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, the United Kingdom, and the United States, is also included. These indices represent stock markets worldwide for which data was available on a consistent and reliable basis. The combined market capitalization of the companies that comprise the indices represents approximately 60 percent of the aggregate market value of the various national stock exchanges. Since these national indices are constructed on the basis of the same design principles and are adjusted by the same formulas, they are fully comparable with one another.

The above mentioned indices, representing market-weighted price averages without dividends reinvested, were retrieved from *Morgan Stanley Capital International Perspective* of Geneva, Switzerland. The Morgan Stanley Capital International indices are considered performance measurement benchmarks for global stock markets and are accepted benchmarks used by global portfolio managers. Each one of the country indices is composed of stocks that broadly represent the stock compositions in the different countries. The overall period examined in this study extends from the first week of January 1980 through the last week of June 2004. After examining the indices' annual correlations for noticeable changes over time, two subperiods were identified. The first subperiod extends from the first week of January 1980 through the last week of December 1994, and the second subperiod is from January 1995 through the last week of June 2004.

While the movements of the various national indices in terms of their local currency may have some informational value, clearly, the indices must be measured in terms of a common currency in order to be directly comparable. A comparison of U.S. stock prices in dollars with British stock prices in pound sterling is similar to a comparison of the movements of the price of oranges in dollars and pound sterling (for details, see Dwyer and Hafer, 1988). In addition, Becker *et al.* (1990) also report that the correlation for common currency returns are lower than the correlation for local currency returns between the U.S. and Japanese stock markets. Thus, as mentioned earlier, the risk of a portfolio protected against exchange rate fluctuations is lower than that of an unhedged portfolio. Hence, the conversion of international indices to a common currency is the standard procedure used in the literature for measuring global integration.

Initially, descriptive statistics for each of the twelve European stock markets as well as the MSCI World Index are generated. Specifically, the weekly percentage returns, based on each stock market's conversion into U.S. dollars, are determined. The data generated in this fashion are then

used to calculate the respective mean weekly percentage returns, their standard deviations, and the skewness and kurtosis for each market and period. Charts are prepared to show each stock market's weekly return and standard deviation graphically by overall period and subperiods.

Second, in order to reveal any possible relationships among the changes in the stock indices over time, this study determines their respective simple correlations. To accomplish this task, initially, the weekly returns for each country index are calculated. These weekly returns are used to determine the correlation between different countries' stock returns by year and subperiod.

## EMPIRICAL RESULTS

Table 1 reports the descriptive statistics of the weekly returns by stock market and period. For the overall period (January 1980 – June 2004), each country's stock market produced positive returns with widely varying values. Specifically, the mean weekly returns range from a high of 0.3317 percent for Sweden to a low of 0.1622 percent for Norway, while the standard deviation varied from a low of 2.5065 for Switzerland to a high of 3.5062 for Sweden. It is of interest to note that, consistent with risk/reward logic, Sweden experienced the largest standard deviation, and the highest rate of return. On the other hand, Norway had one of the highest standard deviations with the lowest rate of return, while Denmark had one of the lowest standard deviations with one of the highest rates of return. The standard deviation for the MSCI World Index is significantly smaller compared to the standard deviations of the individual indices. This outcome is due to the fact that this index is essentially a portfolio consisting of the individual country indices. Thus, many of the return fluctuations occurring in the individual countries offset each other.

As could be expected, the stock markets' weekly returns and their respective standard deviations varied considerably over the two subperiods examined. One notable observation revealed in Table 1 is that, with the exception of two markets, Subperiod #1 generated higher returns as compared to the more recent period. The two exceptions are Spain, which generated a 0.288 percent weekly return during the January 1995 – June 2004 period as compared to 0.1585 percent during Subperiod #1, and Switzerland, where the weekly returns during the two subperiods were nearly identical (i.e., 0.2169 versus 0.2190 percent). Furthermore, reflecting the performance of all global developed stock markets, the returns on the MSCI World Index were significantly higher during the first subperiod as compared to the more recent time.

An examination of the distributional characteristics of the weekly returns reveals that the vast majority of stock market returns are skewed to the left (see negative skewness values). This observation is quite consistent across all subperiods. Finally, checking on the degree of peakedness of the distributions reveals that for the overall period examined, the frequency of weekly return observations close to the respective stock market mean return is low and the frequency of observations farther from the mean is high.

**Table 1: Descriptive Statistics of the Weekly Returns of Major European Stock Markets January 1980 - June 2004, and Subperiods**

| | Overall Period: | | | | Subperiod #1: | | | | Subperiod #2: | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Jan. 1980 - June 2004 | | | | Jan. 1980 – Dec. 1994 | | | | Jan. 1995 – June 2004 | | | |
| **Country Index:** | Mean Weekly Return: | s: | Skew. : | Kurt.: | Mean Weekly Return: | s: | Skew.: | Kurt:. | Mean Weekly Return: | s: | Skew.: | Kurt.: |
| Austria | 0.1698 | 2.872 | 0.236 | 3.338 | 0.2030 | 3.082 | 0.475 | 3.610 | 0.1174 | 2.508 | -0.510 | 1.288 |
| Belgium | 0.1837 | 2.740 | -0.045 | 3.210 | 0.2054 | 2.570 | 0.109 | 1.296 | 0.1494 | 2.990 | -0.190 | 4.631 |
| Denmark | 0.2434 | 2.647 | -0.125 | 1.379 | 0.2531 | 2.711 | 0.022 | 0.771 | 0.2282 | 2.545 | -0.410 | 2.589 |
| France | 0.2123 | 2.992 | -0.374 | 2.756 | 0.2203 | 2.982 | -0.568 | 2.759 | 0.1997 | 3.010 | -0.076 | 2.799 |
| Germany | 0.1984 | 2.990 | -0.256 | 2.084 | 0.2162 | 2.778 | -0.242 | 1.264 | 0.1704 | 3.300 | -0.257 | 2.497 |
| Italy | 0.2388 | 3.456 | -0.118 | 1.220 | 0.2672 | 3.635 | -0.104 | 1.175 | 0.1939 | 3.156 | -0.163 | 1.097 |
| Netherld. | 0.2145 | 2.669 | -0.215 | 3.930 | 0.2566 | 2.415 | 0.082 | 2.333 | 0.1481 | 3.028 | -0.422 | 4.394 |
| Norway | 0.1622 | 3.268 | -0.226 | 2.445 | 0.1785 | 3.458 | -0.131 | 1.893 | 0.1365 | 2.948 | -0.475 | 3.667 |
| Spain | 0.2088 | 3.123 | -0.173 | 1.369 | 0.1585 | 3.103 | 0.001 | 1.545 | 0.2880 | 3.157 | -0.435 | 1.178 |
| Sweden | 0.3317 | 3.506 | -0.221 | 2.273 | 0.3529 | 3.137 | -0.157 | 1.229 | 0.2982 | 4.023 | -0.251 | 2.407 |
| Switzrld. | 0.2177 | 2.507 | -0.286 | 2.269 | 0.2169 | 2.429 | -0.342 | 2.192 | 0.2190 | 2.267 | -0.216 | 2.323 |
| U. K. | 0.1952 | 2.589 | -0.117 | 2.524 | 0.2330 | 2.758 | -0.214 | 2.284 | 0.1355 | 2.298 | 0.115 | 2.758 |
| MSCI World | 0.1848 | 1.981 | -0.348 | 3.077 | 0.2171 | 1.887 | -0.602 | 4.385 | 0.1339 | 2.123 | -0.049 | 1.698 |

NOTE: Weekly returns are in U.S. dollars.

The correlations of the weekly returns on the country stock price indices for the overall period and the two subperiods are reported in Table 2. For the period from 1980 – 6/2004, the findings suggest that the correlation for some European countries is much higher compared to others. For example, Austria consistently showed the lowest correlation with other European markets (typically ranging between 0.2 and 0.3). Other countries with relatively low correlations include Norway, Denmark, Italy, and Spain. In contrast, the linkages for some of the largest European markets is much higher. For example, France, Germany, Switzerland, the Netherlands, and the U. K. show relatively high correlations with other European markets.

An examination of the weekly rates of return by individual years suggests that the correlations among countries remained relatively steady from 1980 through 1994. However, thereafter, it increased somewhat. The increased linkages among markets becomes apparent when the two time frames are compared. Without a single exception, the correlations during the 1995 – 6/2004 period were higher as compared to the earlier period 1980 – 1994. For most countries, the increase in correlation amounted to more than 50 percent.

**Table 2: Changes in Correlations in Weekly Stock Market Returns Among Major European Markets January 1980 - June 2004, and Subperiods**

**Spearman Correlation Coefficients:**

| **Index:** | Austria | Belgium | Denmk. | France | Germany | Italy | Netherl. | Norway | Spain | Sweden | Switz. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Belgium | | | | | | | | | | | |
| 1980-6/04 | .337 | | | | | | | | | | |
| 1980-94 | .306 | | | | | | | | | | |
| 1995-6/04 | .493 | | | | | | | | | | |
| Denmark | | | | | | | | | | | |
| 1980-6/04 | .271 | .482 | | | | | | | | | |
| 1980-94 | .240 | .439 | | | | | | | | | |
| 1995-6/04 | .401 | .551 | | | | | | | | | |
| France | | | | | | | | | | | |
| 1980-6/04 | .324 | .619 | .478 | | | | | | | | |
| 1980-94 | .320 | .551 | .421 | | | | | | | | |
| 1995-6/04 | .387 | .715 | .574 | | | | | | | | |
| Germany | | | | | | | | | | | |
| 1980-6/04 | .364 | .609 | .508 | .666 | | | | | | | |
| 1980-94 | .378 | .518 | .454 | .554 | | | | | | | |
| 1995-6/04 | .416 | .713 | .593 | .819 | | | | | | | |
| Italy | | | | | | | | | | | |
| 1980-6/04 | .243 | .415 | .374 | .493 | .494 | | | | | | |
| 1980-94 | .216 | .321 | .318 | .360 | .373 | | | | | | |
| 1995-6/04 | .358 | .572 | .481 | .735 | .692 | | | | | | |
| Netherl. | | | | | | | | | | | |
| 1980-6/04 | .282 | .647 | .498 | .661 | .700 | .465 | | | | | |
| 1980-94 | .261 | .522 | .449 | .530 | .599 | .344 | | | | | |
| 1995-6/04 | .405 | .782 | .577 | .833 | .807 | .659 | | | | | |
| Norway | | | | | | | | | | | |
| 1980-6/04 | .268 | .426 | .385 | .457 | .459 | .318 | .533 | | | | |
| 1980-94 | .232 | .425 | .331 | .430 | .433 | .250 | .532 | | | | |
| 1995-6/04 | .418 | .442 | .493 | .511 | .514 | .464 | .558 | | | | |
| Spain | | | | | | | | | | | |
| 1980-6/04 | .282 | .516 | .440 | .579 | .580 | .480 | .532 | .411 | | | |
| 1980-94 | .245 | .430 | .364 | .466 | .446 | .366 | .382 | .343 | | | |
| 1995-6/04 | .438 | .634 | .566 | .755 | .760 | .690 | .725 | .542 | | | |
| Sweden | | | | | | | | | | | |
| 1980-6/04 | .230 | .434 | .405 | .527 | .583 | .410 | .523 | .449 | .495 | | |
| 1980-94 | .216 | .347 | .319 | .357 | .443 | .293 | .369 | .417 | .350 | | |
| 1995-6/04 | .326 | .526 | .528 | .741 | .729 | .594 | .675 | .518 | .679 | | |
| Switzerl. | | | | | | | | | | | |
| 1980-6/04 | .355 | .623 | .501 | .631 | .719 | .445 | .688 | .474 | .544 | .524 | |
| 1980-94 | .351 | .539 | .494 | .562 | .708 | .363 | .628 | .477 | .467 | .462 | |
| 1995-6/04 | .436 | .729 | .515 | .730 | .734 | .588 | .762 | .478 | .655 | .598 | |
| U. K. | | | | | | | | | | | |
| 1980-6/04 | .239 | .541 | .445 | .575 | .534 | .451 | .676 | .462 | .490 | .466 | .572 |
| 1980-94 | .222 | .474 | .406 | .480 | .443 | .374 | .633 | .453 | .407 | .355 | .521 |
| 1995-6/04 | .318 | .670 | .527 | .759 | .699 | .620 | .776 | .481 | .653 | .656 | .674 |

An increase in the correlation coefficients among the different countries suggests that national stock indexes have become more linked. The development of the European Union and the economic standards imposed on EU members may have contributed to this increase in the linkages among European stock markets in the more recent time period. However, these results still imply the possibility of some risk reduction and profit potential from international diversification, since the average correlations are far from perfectly positive. These findings are also consistent with the results of previous studies (e.g., Levy and Sarnat, 1970; and Solnik, 1974). Furthermore, Cho *et al.* (1986) tested Solnik's International Asset Pricing Model and concluded that some mild market segmentation exists. Thus, even though European stock markets have become more integrated overall, the evidence here shows that enough cross-country heterogeneity still exists for investors to benefit from diversification beyond country boundaries.

## SUMMARY AND CONCLUSION

This paper's primary contribution to the existing literature consists of the updated evidence generated on the benefits of international portfolio diversification and the consistency of the relationships among international equity markets over time. Specifically, this research examined the extent to which the linkages among the major European stock markets have changed in recent years. Based on the evidence from the last 25 years, the following conclusions can be drawn.

The stock markets in the twelve European countries examined in this study exhibited movements mostly in the same direction, although the magnitude of the movements tended to vary by index, especially after 1994. This paper also documents that overall relationships between and among various European indices do remain relatively stable over time, although the magnitude of the swings did change. These findings are consistent with those of previous studies.

The correlations between and among the major European indices were mixed. On average, the larger markets were highly correlated with others, while the smaller European indices showed much less linkage to the others. Since, on average, the correlation coefficients were far from perfectly positive, these findings imply the opportunity for potential benefits through international diversification, as was also suggested in previous studies.

In conclusion, the evidence generated in this paper supports the claim that a reasonable degree of linkage exists among the major European stock market indices. In fact, these linkages have noticeably increased in recent years, probably due in part to developments such as the European Union. Such characteristics, typical of the existence of overall market efficiency, make it more difficult for investors to earn more than a normal rate of return in these markets. Nevertheless, since European financial markets are not fully integrated, but do exhibit forms of mild segmentation, international diversification is still quite feasible and desirable for investors wishing to reduce portfolio risk.

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# INTERNATIONAL MARKET SELECTION PROCESS: AN INVESTIGATION OF THE RELEVANCE OF BUSINESS OPERATING ENVIRONMENT

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## ABSTRACT

*Different researchers have recommended different decision frameworks for international market selection. As parts of those decision frameworks, most researchers have recommended for the evaluation of macro-environmental and business operating environmental variables. However, few attempts have been made so far to empirically test those frameworks. This study provides a partial test of those frameworks. Specifically, it looks at the host country's business operating environmental variables recommended by different researchers. Using both exploratory and confirmatory factor analysis techniques it identifies the operating environmental factors considered by the successful Australian international businesses in their international market selection process. Three constructs and their measurement variables identified through literature review has been tested. The constructs are: target country's cost indicators; structutral compatibility indicators and policy indicators.*


## INTRODUCTION

International marketing researchers (Kumar et al, 1993; Douglas and Craig, 1989 and 1992) have stressed the importance and the need for systematically evaluating and selecting potential foreign markets. A number of researchers have either developed decision frameworks (frequently referred as models in the literature) and methodologies for international market selection or applied existing ones (Moyer, 1968; Walvoord, 1980; Cavusgil, 1985; Vargas-Carcamo, 1986; Root, 1987; Walsh, 1993; Kumar et al 1993; Hoffman, 1997; Daniels and Radebaugh, 1998). These decision frameworks present the international market selection process as gradual and necessarily sequential. There is general agreement in the literature that: a screening process is desirable; and market size and level of economic development should be considered early on in the decision process for identifying potential opportunities (Goodnow and Hansz, 1972; Litvak and Banting, 1973; Cundiff and Hilger, 1984; Cavusgil, 1985; Connolly, 1987; Young et al., 1989; Ball and McCulloch, 1993; Papadoupoulos and Jansen, 1994; Daniels and Radebaugh, 1998; Rahman 2001).

Sources of macro-level criteria to be used in screening potential international markets as recommended by the above decision frameworks are primarily the macro-environment and the operating environment of the international market. The primary element of the macro-environment recommended for screening international markets are economic in nature. Most of the other evaluation criteria recommended are related to the market's operating environment, ie. existing infrastructure, accessibility, taxes and duties, and costs of entry.

However, limited empirical testing of these frameworks has been undertaken (Aulakh and Kotabe, 1992; Rahman 2001), with not much reported research having been carried out in Australia. As a part of the overall pursuit of developing a decision framework for international market selection process, this article attempts to identify the international market's operating environment constructs that are part of the overall framework. Specifically, the present study aims to address the following research questions: What, if any, international market's operating environment constructs are considered by the successful Australian international businesses in their international market selection process? What are the measurement scales of those constructs? Answers to these questions will be useful to corporate policymakers, and facilitate theory advancement in the field, particularly in developing an integrated overall decision framework for international market selection.

## CONCEPTUAL FRAMEWORK

As Russow and Okoroafo (1996) states, " While descriptions of screening techniques exist, there is a good deal of disagreement about which criteria to use." (pp.47-64). The operating environmental constructs generally recommended by the researchers (Cavusgil, 1985; Walvoord, 1980; Root, 1994; Rahman 2001) can be grouped into three categories: (1) target country's cost indicators, (2) target country's structural compatibility indicators, and (3) target country's policy indicators.

All countries control exports and imports to some degree, providing both barriers to trade and support for certain domestically as well as foreign-produced goods and services. Barriers to trade include tariffs, non-tariff barriers and trade embargoes or sanctions. Tariffs have traditionally been used as barriers to international trade. International trade liberalisation during the last decade of this century has led to a significant reduction of tariff barriers. Therefore, governments have been increasingly using non-tariff barriers to protect some of their countries' industries, which they have identified as being unable to withstand free international competition. Both tariff and non-tariff barriers are designed to increase cost of marketing by an overseas marketer. In addition to the tariff and non-tariff barriers, there are other marketing costs that needs to be assessed including distribution and sales costs.

The international trade policy of a country's government provides a framework for exports, imports and foreign investment and therefore needs to be closely analysed by the international

marketer. A government may also support or deter international business through its investment policy, ie, through the general rules governing legislation concerning domestic as well as foreign participation in the equity or ownership of firms of the country, pricing of products, and profit repatriation. One major contemporary concern of international marketers is the protection of their intellectual properties. The extent of such protection within the international target market has also been proposed as a consideration for international market selection process (Cavusgil, 1985).

The legal environment of a country, that is, the set of laws and systems to enforce those laws established by a society to govern its members behaviour, must also be assessed by the international marketer as this determines the political and legal viability of potential international market. Generally, important consideration is given to the structure of the existing legal system, relevant agreements and conventions that the country's government has signed, and a country's competition regulations. Overall, the compatibility of the legal system with the firm's home system needs to be closely analysed.

Cavusgil (1985) and Walvoord (1980) have recommended for assessment of political and legal environment and its compatibility to the home market for evaluating international market attractiveness. Most firms are unable to influence the political and legal environment of their markets directly, yet their opportunities for successful business conduct largely depend on the structure and content of that environment. A marketer serving international markets or planning to do so, therefore, has to assess carefully the political and legal environments of the markets served or under consideration to draw the appropriate managerial consequences.

Culture, defined as the standards of beliefs, perceptions, evaluation and behaviour shared by the members of a social group, strongly influences the behaviour of firm's consumers. Business people are also members of a national culture, which strongly influences the basic values they share with others. In addition, they follow norms of behaviour, which are part of the industrial culture to which their firm belongs. Each firm develops an organisational culture, that is, a set of behavioural norms specific to the firm. All those values and norms, potentially combined with a functional culture, influence the behaviour of potential business partners and stakeholders in international marketing. Assessment of business culture compatibility has been recommended for international market selection.

Among other operating environmental variables recommended for international marketing to be possible are compatibility of business system and distribution structure of the target country with the firm's requirements. A certain standard of transportation, communication and commercial infrastructure has to be in place for an international market to be selected as a target.

Overall, table 1 shows the operating environment constructs and their measurement scales for international market selection, as recommended by the current international market selection literature:

| Table 1: Operating Environment Constructs and their Measurement Scales | | | |
|---|---|---|---|
| Constructs | Cost Indicators | Structural Compatibility Indicators | Policy Indicators |
| Measurement Variables | 1. Tariff barriers<br>2. Nontariff barriers<br>3. Marketing costs | Availability of local business partners<br>Potential to develop strategic alliances<br>Business structure compatibility<br>Distribution system compatibility<br>Legal system compatibility<br>Business culture compatibility<br>Level of corruption<br>Level of own government support | International property right laws<br>Level of government control on business<br>Pricing restrictions<br>Profit repatriation restrictions<br>Political stability in the country |

## METHODOLOGY

As recommended by Churchill (1979), a widely used process for developing measurement scales in marketing involve the following steps: (1) defining a theoretical construct; (2) generating a list of items from literature and/or qualitative research that relate to this construct; and (3) purifying these measures using exploratory factor analysis and coefficient alpha.

In this research all the above three steps have been followed. Further, the third step has been supplemented with confirmatory factor analysis using structural equation modelling (SEM) technique. Theoretical constructs have been defined and lists of items that relate to the constructs have been identified from the literature.

In the quantitative research phase both exploratory and confirmatory factor analysis techniques have been used. Exploratory factor analysis has been used to test dimensionality of data with the aim to produce a set of items that reflect a single underlying factor or construct, and confirmatory factor analysis using structural equation modelling (SEM) program EQS to achieve a more rigorous estimation of reliability, and formally test the unidimensionality of the scales.

The use of multi-item scales to measure a construct is considered superior to single item scales as it increases reliability and decreases measurement error (Churchill, 1979). These sets of items are generally reflective in that they all measure the same theoretical construct. Coefficient alpha is used to measure the reliability of the scale. Exploratory factor analysis is considered a test of dimensionality, with the aim to produce a set of items that reflect a single underlying factor or construct (Norusis, 1992). This method is particularly suitable where no prior knowledge on measurement are reported. This traditional approach has since been expanded with the use of confirmatory factor analysis.

### Sample

As the research objective was to determine the operating environmental constructs considered by successful Australian international businesses in selecting their international markets,

the target population was defined as Australian product/service marketing firms, who are active and successful in international markets. International business success has been measured in various ways by researchers, including international sales level (Madsen, 1989), international sales growth (Cooper and Kleinschmidt, 1985), international sales to total sales ratio (Axinn, 1988), and the increase in importance of international business to the total business (Cavusgil and Kirpalani, 1993). These varieties of measures indicate that, there is no uniform definition of success in international marketing research (Cavusgil and Zou, 1994). In this case, the critical issue of success was ascertained through the end result. Accordingly, two sample frames were selected. The first one represented the 145 Australian firms who were finalists and winners of the annual Australian Export Award during the 1990s. The judging criteria for this award includes: international sales level, international sales growth, quality of firm's international marketing strategy and level of internal support to international activity. The second frame comprised of the 500 Australian firms that were listed in the BRW Top 500 Australian exporter list. The judging criterion for this is level of international sales. As there were some firms whose names were in both the lists, the total number of firms to whom questionnaires were sent was 546. Each questionnaire was sent with personally addressed letter to the individual responsible for the international operations of the firm. A total of 195 completed questionnaires were returned.

One critical issue for this research was sample size. Even though individual observations are not needed as with all other multivariate methods, the sample size plays an important role in the estimation and interpretation of (SEM) results. 200 has been proposed as the critical sample size for SEM analysis (Boomsma, 1983; Hair et al, 1992). In a study of empirical research reports in international marketing, Aulakh and Kotabe (1992) found the mean sample size as 197.6 and response rate as 40.5 per cent. In this survey, out of the 546 companies 195 responded, giving a response rate of 35.7 per cent, which is close to the standard and expectations.

**Data Collection**

Deciding who will receive the questionnaire is done in conjunction with setting objectives for its results. In line with the research objectives in this study, the questionnaires were required to be completed by the managing director, international marketing manager, export manager or anybody selected by them as suitable to represent them and who is involved in the decision making process of international target market selection. Accordingly, a personalised letter giving background information on the research, along with a copy of the questionnaire and self addressed prepaid return envelop were sent to each selected firm. A great deal of importance was given and care taken on the construction of the questionnaire and the transmittal letter that accompanied it, as in mail surveys no personal interaction is available to advise respondents or encourage their participation.

After thorough editing of the 195 questionnaires returned, all of them were found satisfactory. Only four questionnaires had missing values (demographic data only). Demographic was included in the questionnaire for classification purposes only. As a result, all responses were acceptable for final analysis

Initially all data collected was codified and entered into a SPSS for WINDOWS release 6.0 spread sheet which was previously constructed and tested. Strict controls were enforced to ensure the integrity of the data. Measures taken included the examination of the value of each data cell independently by two research assistants who proof read the original data against a computer printout (Tabachnick and Fidell, 1996). Exploratory factor analysis was conducted on this data set. Based on the results obtained several variables were eliminated. The remaining data set was screened and entered into EQS (SEM software used) for final analysis.

**Methods of Analysis**

Confirmatory factor analysis using EQS, LISREL or other structural equation modelling (SEM) programs, gives a truer estimation of reliability and formally tests the unidimensionality of a scale (Hoyle, 1995). It is therefore considered a more rigorous scale development procedure. For the data analysis in this research EQS has been used as the preferred software, largely because of its user-friendly features.

The data set (N=195) with a univariate kurtosis value >0.512 was not normal. Several variables yielded values greater than this, indicating some non-normality of the data. Therefore, the ML robust estimation method was used to re-estimate the model, as the robust estimation is more suitable when data is suspected of being non-normal (Bentler, 1995).

## RESEARCH RESULTS

As has been discussed before both exploratory and confirmatory factor analysis techniques have been used in this research. Exploratory factor analysis has been used to test dimensionality of data with the aim to produce a set of items that reflect a single underlying factor or construct, and confirmatory factor analysis using SEM program EQS to achieve a more rigorous estimation of reliability, and formally test the unidimensionality of the scales.

**Results of Exploratory Factor Analysis**

Factor analysis was applied using principal-axis factoring method, with eigenvalues set to 2. In most instances eigenvalues of 1.0 or greater represents the maximum number of factors that can be considered as stable (ie., replicable) (Diekhoff, 1992). However, when a large number of variables are being factor analysed, many unimportant factors will be associated with eigenvalues

as large as 1.0, making it especially important to consider other indicators of the "correct" solution. Determining the correct number of factors is a matter of balancing comprehensiveness against parsimony. In practice, one is usually happy with a factor solution that explains 50-75% of the variance in the original variables (Diekhoff, 1992). In this case, the cut off point of eigenvalues of 2.0 gave factor solution that explained more than 60% of the variance. Another consideration in determining the cut off point was interpretability of factors. Factors are interpreted by examining their correlations, called loading, to the *p* original variables. This interpretation is often facilitated by factor rotation, the second stage of factor analysis, in which original factors are redefined. In this research, a varimax rotation of factor matrix was used.

Table 2 shows the factors extracted with the variables that explain each of the factors. Some variables from the original list of variables (see Table 1) whose factor loading fell below 0.3 were dropped from further analysis at this stage, as this level of loading has been considered insignificant and also because of their significant cross loadings. These variables include: availability of local business partners, potential to develop strategic alliances, and political stability in the country.

The resulting factors and the observed variables that explain those factors have been subjected to further analysis through application of the measurement model of SEM. Exploratory factor analysis is particularly suitable where no prior knowledge on measurements is reported or when underlying structure of measures is not well understood (Gerbing and Anderson, 1985). This traditional approach to scale development has since been expanded with the confirmatory factor analysis (Gerbing and Anderson, 1988). Confirmatory factor analysis gives a truer estimation of reliability and formally tests the unidimensionality of scale (Steenkamp and Van Trijp, 1991).

**Table 2 Factors, Variables and Factor Loadings**

| Variables | Factor 1: Cost Indicators | Factor 2: Structural Compatibility Indicators | Factor 3: Policy Indicators | Coefficient Alpha |
|---|---|---|---|---|
| Tariff Barriers | .8591 | | | |
| Non-tariff Barriers | .8582 | | | .99 |
| Marketing Costs | .8524 | | | |
| Business Structure Compatibility | | .8496 | | |
| Distribution System Compatibility | | .8548 | | |
| Legal System Compatibility | | .8582 | | .88 |
| Business Culture Compatibility | | .8601 | | |
| Level of Corruption | | .3979 | | |
| Level of Own Govt. Support | | .3088 | | |
| International Property Right Laws | | | .8478 | |
| Level of Govt. Control on Business | | | .8436 | .99 |
| Pricing Restrictions | | | .8501 | |
| Profit Repatriation Restrictions | | | .8608 | |

## Measurement Models

Three measurements model, for the three factors identified through exploratory factor analysis, were tested. To determine the adequacy of the models several measures were used. This included the distribution of standardised residuals (Ullman, 1996), number of iterations required to converge (Bentler, 1995), multiple adjunct fit indexes, and t-ratios (Hair et al, 1992; Tanaka, 1993; Hoyle, 1995).

## Target Country's Cost Indicators

Three measured variables, "tariff barriers", "non-tariff barriers" and "marketing costs" estimate this construct. As this construct contained only three items, to address the issue of "statistical identification" (Byrne, 1994) the value of the regression path between "tariff barriers" and the factor was set to one (1). Highly significant t-ratios for the measured variables as shown in Table 3 indicate the validity of this measurement model. The distribution of standardised residuals was symmetric and centred around zero suggesting good specification of the model. The model also converged quickly in four iterations. The Comparative indices showed a perfect fit (1.000). Wald test did not indicate the need to drop any of the parameters. Thus, all variables were retained. Table 3 shows the factor loadings and t-ratios.

**Table 3 Target Country's Cost Indicators - Factor Loadings and t-ratios**

| Target Country's Cost Indicators | Factor Loading | t-ratio (Robust) |
|---|---|---|
| Tariff barriers | Fixed | 24.895 |
| Non-tariff Barriers | 1.576 | 24.002 |
| Marketing costs | 1.535 | |

## Target Country's Structural Compatibility Indicators

The measurement model for the unmeasured factor "target country's structural compatibility indicators" was estimated by six measured variables as shown in Table 4. The distribution of standardised residuals was close to being symmetrical and centred around zero suggesting appropriate specification of the model. The model also converged quickly in four iterations. $c^2$ (27, N = 195) = 96.639, $p < .001$, the Comparative Fit Index (CFI) 0.966, Robust Comparative Fit Index (RCFI) 0.971, Bentler-Bonett Normed Fit Index (BBNFI) 0.954, and Bentler-Bonnett Nonnormed Fit Index (BBNNFI) 0.955, indicated a good fit for the model. Moreover, all the t-ratios, except for “level of government support”, were highly significant. Wald test supported the dropping of "level of corruption" and "level of own government support". Thus, these two variables were dropped. Table 4 shows the factor loadings and t-ratios for this measurement

| Table 4: Target Country's Structural Compatibility Indicators - Factor Loadings and t-ratios | | |
|---|---|---|
| Target Country's Structural Indicators | Factor Loading | t-ratio (Robust) |
| Business structure compatibility | 1.318 | 23.331 |
| Distribution system compatibility | 1.357 | 24.039 |
| Legal system compatibility | 1.350 | 24.412 |
| Business culture compatibility | 1.365 | 22.496 |
| Level of corruption | 0.797 | 7.252 |
| Level of own government support | 0.422 | 3.857 |

### Target Country's Policy Indicators

This unmeasured factor was estimated by four observed variables, "international property right laws", "level of government control on business", "price restrictions" and "profit repatriation restrictions". The distribution of standardised residuals for this model as was symmetric and centred around zero suggesting good specification of the model. The model also converged quickly in five iterations. $c^2$ (5, N = 195) = 24.780, $p < .001$, the Comparative Fit Index (CFI) 0.990, Robust Comparative Fit Index (RCFI) 0.999, Bentler-Bonett Normed Fit Index (BBNFI) 0.988, and Bentler-Bonnett Nonnormed Fit Index (BBNNFI) 0.980, indicated a good fit for the model. Moreover, all the t-ratios were highly significant. Wald test did not indicate the need to drop any of the parameters. Thus, all variables were retained. Table 5 shows the factor loadings and t-ratios for this measurement model.

| Table 5 Target Country's Policy Indicators - Factor Loadings and t-ratios | | |
|---|---|---|
| Target Country's Policy Indicators | Factor Loading | t-ratio (Robust) |
| International property right laws | 1.426 | 27.409 |
| Level of government control on business | 1.401 | 25.215 |
| Pricing restrictions | 1.412 | 26.185 |
| Profit repatriation restrictions | 1.353 | 25.113 |

## DISCUSSION

The literature review has identified key aspects of the operating environment that needs to be considered in selecting international markets. Three constructs and sixteen measurement variables identified through literature review has been shown in table 1. In this section findings relating to the successful Australian international businesses regarding those constructs and variables are discussed. Effective international market evaluation requires an accurate understanding of the cost drivers associated with competing in a specific market. One major and transparent cost factor for international marketers is tariffs. When products are transported across national borders, tariffs have

to be paid unless a special arrangement exists between the countries involved. Tariffs place international marketers at a competitive disadvantage to local import-competing firms. Although tariffs have generally declined over recent years, they still influence the price competitiveness in international markets and, as such, are considered in the international market selection process. Tariffs also have strategic implications for marketers. Firms can adopt strategies such as local assembly to avoid tariffs, because tariffs on components are frequently lower than on finished products. While tariffs are generally declining, the use of nontariff barriers such as quotas is growing. Such nontariff barriers are also considered by the successful Australian international businesses for market selection purposes. The third cost variable considered is the marketing costs involved. Marketing costs may include distribution costs associated with channel length, gross margin, and logistics and transportation costs associated with the shipment of products over long distances.

Successful Australian international businesses also consider some structural aspects of international markets and assess their compatibility with their own objectives, and strategies. Such structural aspects include, host country's business culture and structure, distribution system and the legal system within which business operates.

The impact of host country policy indicators on market selection has been confirmed by this research. Though policy indicators tend to be more subjective than the quantitative indicators of market size, they are equally important in international market selection process. In some countries, government and regulatory agencies control various aspects of business, particularly the prices of products and services. There are cases where a competitor in the target market is a government owned enterprise. There are also restrictions in some countries on profit repatriation. All of these variables are considered by the successful Australian international businesses in selecting their markets. Host governments have a direct influence on the operation of a foreign subsidiary by imposing specific conditions on the firm's business practices and processes. The rules of conducting business may challenge the international firm. Operating conditions for international firms are of particular importance when they affect the freedom to run marketing programs. Host countries may restrict international firms in the area of pricing, advertising, promoting, selling, distributing, and many other elements. Where such operating restrictions apply to all firms, domestic and international, the competitive threat is lessened; however, firms might still find such restrictions a problem when the way they have to operate varies from what they are accustomed to. Where operating restrictions apply to foreign firms only, the result will be a lessening of competitiveness, and firms should seriously consider these constraints before entering a market.

One variable that is considered by the successful Australian international businesses is the international property right laws in the target country and the protection it offers to products, processes and symbols. Pirating products has been a significant problem since the 1980's. As a result, copyright laws and violations are becoming an increasing concern for international marketers and this is evident in its inclusion in the market selection criteria.

Overall, table 6 shows the operating environmental constructs and their measurement variables considered by successful Australian international marketers in their international market selection process.

**Table 6 Operating Environmental Constructs and their Measurement Variables Considered by Successful Australian International Businesses**

| Constructs | Cost Indicators | Structural Compatibility Indicators | Policy Indicators |
|---|---|---|---|
| Measurement Variables | 1. Tariff barriers<br>2. Nontariff Barriers<br>3. Marketing costs | Business structure compatibility<br>Distribution system compatibility<br>Legal system compatibility<br>Business culture compatibility | International property right laws<br>Level of government control on business<br>Pricing restrictions<br>Profit repatriation restrictions |

## MANAGERIAL AND THEORETICAL IMPLICATIONS

International market selection is a major step in the overall process of moving into international markets. Many international marketers play a leading role in the selection process; others take expert help from agencies, such as AUSTRADE, in Australia. Accordingly, the findings of this research will be of interest to international marketers in Australia and overseas. In selecting international markets managers must evaluate market potential not only on the basis of market size and growth but also market's operating environment.

This research has identified and tested specific constructs, and has developed multi-item measurement scales for those constructs. These constructs, and their measurement scales, can now form the basis for further research in the area both in Australia and overseas. Compared to internationalisation process theories, international market selection is not a well-researched area. There has been no reported study in Australia and such research has not been widely reported overseas. This research is study on an important, but overlooked, area of business importance.

## LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

This research has been conducted in Australia only. Australia with less than 2% share of the world GDP and less than 1% share of the annual international trade is relatively a small player internationally. Accordingly, the findings of this research may not be treated as an international phenomenon and needs to be tested with firms in other countries.

This research identifies operating environment constructs or factors that are the part of the international market selection process and the measurement scales of each of those constructs. This research didn't endeavour to identify the relative importance of those constructs and measurement scales or the weight that may be assigned by individual firms to each of those constructs and

measurement scales. While it was not an objective of this research to find out such relative importance, if any, future research may be conducted to establish whether individual firms will need to assign a firm-specific numerical weight to each factor and variable to indicate their relative importance in the international market selection process.

The aim of this research was to establish whether successful Australian international businesses do consider operating environment factors in their international market selection decisions and if they do, what those factors are and what are their measurement scales. Now that the operating environment factors and their measurement scales have been established, further research needs to be carried out to establish the overall decision framework of international market selection process and how these operating environmental factors identified through this research interact with other market related and organisational factors in the overall decision process.

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# EFFECTS OF GENDER AND FAMILY ON PAY DIFFERENTIALS IN WESTERN INDUSTRIAL SOCIETIES: CONVERGENCE AND DIVERGENCE

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## ABSTRACT

*This study takes a comparative approach to examine factors that influence gender-based pay differentials and career paths in western industrial societies, particularly comparing the United States and selected European countries. Results indicate that increased participation of women in the workforce while maintaining their traditional roles at home is a global phenomenon, but patterns of the work-family relationship and the impact of gender and family on pay differentials differ across borders. Factors that influence gender equity in wages and wage growth range from cultural norms to quality of labor, career patterns, and corporate practices. Types of regime pertaining to the role of state in work-family arrangements and wage settings also help explain trends and developments in pay gap adjustment and career patterns between men and women in western industrial societies. Based on recent national and regional statistics and previous research on the effects of gender and family on pay equity, several propositions have developed through a multivariate conceptual framework. Suggestions for future research and implications for the practical field are discussed.*


## INTRODUCTION

This study investigates effects of gender and family on pay differentials and career paths from a cross-cultural perspective, with special attention to western industrial societies. For most men and women today, work and family are central life domains and the work-family relationship has become an increasingly important object for research, and for policy making in the practical field. As well gender equity and work-family interfaces are increasingly recognized as significant organizational issues. This is largely because of increased participation of women, of dual career couples, and of single-parents in the workplace. In the United State, for example, only about 43% of women aged 16 and older participated in the workforce in 1970, but by 2004, the rate had raised to about 60% (USDOL & BLS, 2005). At the same time, working mothers with children under age of 18 rose from 47% in 1975 to 71% in 2004. Along with their rising rate of participation in the workplace, women have also made substantial inroads into better-paying occupations. The proportion of women employed as managers, administrators, or executives nearly have doubled in

the past two decades. However, the median weekly earnings for female full-time wage and salary workers are 76% of the median for their male counterparts, although the earnings gap between women and men has narrowed for most all age groups (UDDOL & BLS, 2001). Among all married-couple families, about 58% are dual earners, but working wives' earnings remain largely a secondary income for the household, averaged about 35% of the total household income (USDOL & BLS, 2005). Meanwhile, economic and business globalization has made gender equity and work-family adjustment pivotal to organizational competitiveness across borders. There has been empirical evidence that family adaptability is an important predictor for expatriate performance among surveyed multinationals headquartered in Europe or the United States (Brewster, 1988; Hamil, 1989; Marx, 1996; Tung, 1981; Yang, 2005). Effective management of the workforce diversity and pay equity, including both visible (e.g., gender and marital status) and invisible variables (e.g., variation in family demand and cultural norms about gender roles), is significantly related to organizational outcomes such as productivity, job satisfaction, workplace morale, and employee well-being (Frone, 2003; Yang 2005). It has been argued that with increased women participation in the domestic workforce and as the international experience becomes increasingly important for career progression, there will be more female expatriate managers in multinationals (Dowling & Welch, 2005). Clearly, multinational firms and global managers need to be aware of gender, family and cultural influences on their operations, human resource management, and organizational justice across borders.

It is under those circumstances that this study takes a comparative approach to investigate potential factors that influence gender-based pay differentials and career paths in western industrial societies, particularly focusing on the United States and selected European countries. Variables analyzed include cultural values, types of regime, education, family status, employment status, occupations, and corporate practices. Suggestions for future research and implications for the practical field will follow.

## GENDER EQUITY AND WORK-FAMILY INTERFACES

Previous research indicates that gender and family structural diversity stand as significant variables that affect career patterns and pay differentials in the workplace (e.g., Blau & Kahn, 1992; Dowling & Welch 2005; den Dulk 2001; Schneer & Reitman, 1993; Zellner, 2003). Recent national and regional statistics show that gender-based differentials in wages and wage growth persist in all industrial societies, but the size of these differentials varies considerably (e.g., EU Foundation, 2001; USDOL, 2001). While women by average are paid significantly lower than their male counterparts, gender-based pay gaps appear smaller for single women as compared to those with family responsibilities (Blau & Kahn, 1992), indicating that marital status is an important influence on the economic well-being of women employees. However, the impact of family responsibility on pay and career patterns should not be limited to a mere gender issue. As an example, a U.S.-based study

found that among married men with MBA degrees, those with house-making wives tend to have more frequent promotions and better pay increases than do their counterparts with working wives (Schneer & Reitman, 1993), indicating that the family structural difference (e.g., single versus married, nuclear versus dual-earner, and single-parent families) is an important predictor for pay differentials and career paths for male employees as well. Furthermore, cross-cultural studies found that gender and family are among top predictors for international assignments and expatriate performance (e.g., Adler, 1984, Brewster, 1988; Hamil, 1989; Marx, 1996; ORC, 2003; GMAC, 2000; Tung, 1981). There are both organizational barriers and cultural concerns for selecting dual-career couples and female expatriates for international assignments (Dowling & Welch, 2005; Yang 2003). Myths about gender and family for international assignments include such assumptions as women are unwilling to travel, women are too soft to represent a competitive firm, foreigners' unwillingness to accept female managers dooms women expatriates to failures, dual-career couples are less committed to the organization than are men with nuclear families, etc. One the one hand, assumptions like those contribute to what has been referred to as "the glass border" that supports "the glass ceiling". On the other hand, recent international surveys indicate that although typical expatriates remain predominantly male (about 82%), today's expatriates are largely with family responsibilities (about 65%) and the proportion of female expatriates has been increasing, from just 3-5% about 20 years ago (Adler, 1984; ORC, 1992) to about 18% in the beginning of the new millennium (GMAC-GRS 2002). Developments in gender equity and career opportunities within and across borders challenge the assumptions about the suitability of male versus female and single versus married employees for the workplace assignments and promotion. Clearly, it is necessary to compare cultural dimensions and corporate practices in the research of gender equity and work-family interfaces for both men and women employees within the context of socioeconomic changes.

## TRENDS AND MAJOR DIFFERENCES IN GENDER-BASED PAY GAPS

Increased participation of women in the workforce while maintaining their traditional roles at home is a global phenomenon, but patterns of the work-family relationship and the impact of gender and family on pay differentials differ across borders. As shown in Table 1, women by average are paid significantly lower than their male counterparts in western industrial societies, but the pay gaps have been considered narrowing in most countries listed (EIRO, 2001; USDOL & BLS, 2001). Smaller women's average earnings as percentage of men's represent larger pay gaps. In addition, gender-based pay gaps appear larger for white-collar workers than for blue-collar workers (as classified in Belgium, France, and Germany). Those labor statistics by nation show seminaries among western industrial countries in gender-based pay differentials and recent developments. However, there are also marked differences in gender equity for wages and wage growth. In comparison, gender-based pay gaps are averaged smaller among European industrial societies, about

78.6%, than that of the United States, about 76%. Among European societies, gender-based pay gaps differ significantly from below 70% (largest in Austria, about 67%) to over 80% (smallest in Luxemburg, about 85%).

**Table 1: Pay Gap Developments in EU and the United States**

| Country | Time Period | Women's Average Pay as Percentage of Men's | Trends* |
|---|---|---|---|
| Austria | 1990-99 | 68% → 67% (monthly gross earnings) | Increasing |
| Belgium | 1991-96 | 75.3% → 79.4% for blue-collar workers<br>64.2% → 70.1% for white-collar workers (gross annual earnings) | Narrowing |
| Denmark | 1995-99 | 83.61% → 82% in private sector | Stable |
| Finland | 1990-99 | 80% → 82% (monthly earnings). | Stable |
| France | 1991-98 | 84.2% → 88.2% for full-time employees (monthly pay)<br>75.1%→ 75.8% for all employees including part-time | No information |
| Germany | 1997-00 | 75.3% → 75.8% for blue-collar workers (West Germany)<br>69.4% → 70.4% for white-collar workers (West Germany). | Narrowing |
| Greece | 1996-98 | 80% (average gross hourly earnings) | Narrowing |
| Ireland | 1987-97 | 80% → 84.5% (hourly earnings) | Narrowing |
| Italy | 1991-98 | 82.3% → 81.7% (annual income). | No info |
| Luxembourg | 1995-00 | 85% (1999 average, no overtime figures given) | Narrowing |
| Netherlands | 1990-98 | 73% → 77% (hourly pay) | Narrowing |
| Portugal | 1997-98 | 77% → 76.5% (monthly pay) | Increasing |
| Spain | 1996-00 | 74.9% → 76.9% (monthly pay) | Narrowing |
| Sweden | 1995-00 | 84% → 82% (monthly pay) | Increasing |
| U.K. | 1990-00 | 76.6% → 80.6% (hourly pay) | Narrowing |
| U.S. | 1983-00 | 66.6% → 76.0% (weekly full-time wage and salary) | Narrowing |

Source: Adapted from national data by EIRO; Eurostat data, May 2001, Theme 3; US DOL Bureau of Labor Statistics, August 2001. * Trends are determined by individual countries.

## CULTURAL VALUES

Various factors may influence divergence and convergence in gender-based pay gaps and career alternatives among western industrial societies. From a cross-cultural perspective, cultural values such as masculinity versus femininity tend to influence work-family interfaces and create different situations for men and women in the workplace (Hofstede, 1980). A masculinity-oriented society expects men to be more aggressive and to take a predominant role as the breadwinner in the family, while women should be tender and be more focused on the role of mother and homemaker.

In contrast, in femininity-oriented societies, gender roles are less distinct and men and women are more likely viewed as equals, and therefore, tend to experience smaller gender-based pay gaps. In line with this argument, one can expect gender-based pay gaps to be larger in masculinity-oriented societies than in femininity-oriented societies.

Incorporating cultural values into the comparison of gender-based wages and wage growth among western industrial societies (Table 2), the degree of gender pay equity tends to be higher in more femininity-oriented societies such as Denmark, Finland, Luxemburg, and Sweden (all above 80%), and lower among more masculinity-oriented societies such as Austria, Germany, and the United States (about 67-76%). There are also exceptions among countries scored relatively high (e.g., Italy) or low (e.g., the Netherlands) on the masculinity-femininity value dimension, indicating that the masculinity-femininity dimension alone is not adequate enough to fully explain gender-based pay gaps and adjustment. Other factors may jointly influence the degree of gender equity and trends in wages and wage growth in different societies.

**Table 2: Cultural Dimension Scores and Gender-based Pay Gaps**

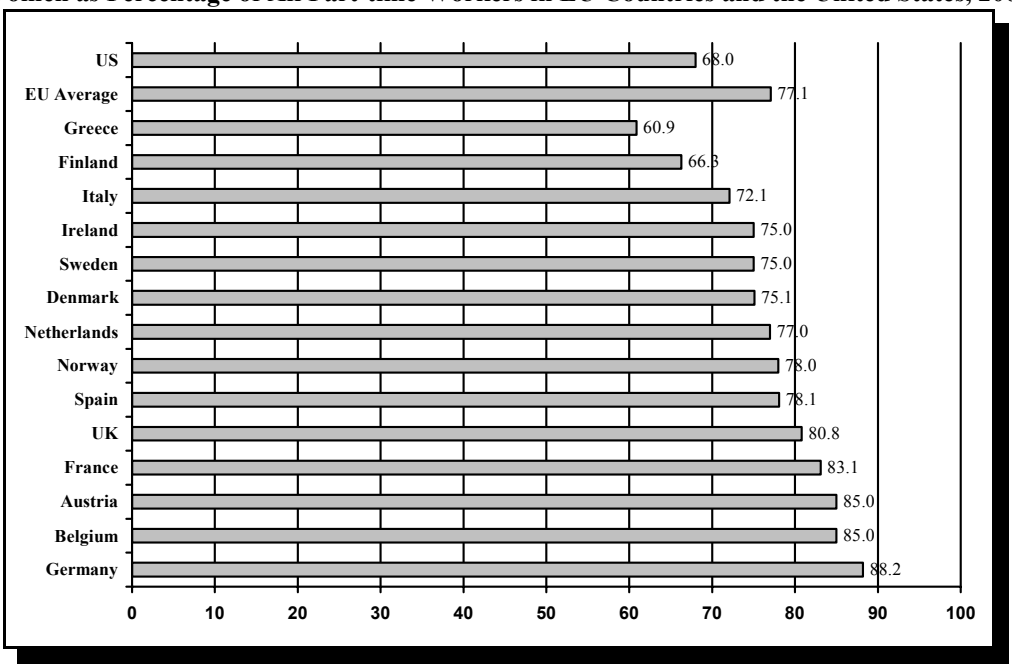
| Country | Masculinity-Femininity Scores | Women's Average Pay as Percentage of Men's |
|---|---|---|
| Austria | 79 | 68% → 67% (monthly gross earnings) |
| Belgium | 54 | 75.3%→ 79.4% for blue-collar workers<br>64.2% → 70.1% for white-collar workers (gross annual earnings) |
| Denmark | 16 | 83.61%→ 82% in private sector |
| Finland | 26 | 80% → 82% (monthly earnings). |
| France | 43 | 84.2% → 88.2% for full-time employees (monthly pay)<br>75.1% → 75.8% for all employees including part-time |
| Germany | 66 | 75.3% → 75.8% for blue-collar workers (West Germany)<br>69.4% → 70.4% for white-collar workers (West Germany). |
| Greece | 57 | 80% (average gross hourly earnings) |
| Ireland | 70 | 80% → 84.5% (hourly earnings) |
| Italy | 76 | 82.3% → 81.7% (annual income). |
| Luxembourg | 50 | 85% (1999 average, no overtime figures given) |
| Netherlands | 14 | 73% → 77% (hourly pay) |
| Portugal | 31 | 77% → 76.5% (monthly pay) |
| Spain | 42 | 74.9% → 76.9% (monthly pay) |
| Sweden | 5 | 84% → 82% (monthly pay) |
| U.K. | 66 | 76.6% → 80.6% (hourly pay) |
| U.S. | 62 | 66.6% → 76.0% (weekly full-time wage and salary) |

Source: Adapted from Hofstede (2001) national data by EIRO; Eurostat data, May 2001 Theme 3; USDOL Bureau of Labor Statistics, August 2001.

## EMPLOYMENT STATUS AND CAREER PATTERNS BY GENDER

Despite women's increasing participation in the workforce and their success in moving into managerial positions, gender-based pay gaps persist in western industrial societies, which can be partially attributed to the considerable difference in employment status (e.g., part-time versus full-time status) and career patterns (e.g., gender-oriented occupations) between men and women. Although there are increased dual-earner or dual-career couples in the workplace (both spouses are working), women continue to carry a predominant share of family responsibility. As a result, women tend to have late careers or more employment breaks due to marriage, childbirth, child care or other family responsibilities. As illustrated in Figure 1, consistent among western industrial societies, part-time employees are predominantly female (EU Foundation, 2001). In the United States, women working part time, defined as less than 35 hours per week, represented 25.7% of all female wage and salary workers in 2004, whereas 10.8% of men fell into the same category (USDOL & BLS, 2005).

**Figure 1**
**Women as Percentage of All Part-time Workers in EU Countries and the United States, 2000**




Source: EU Foundation, 2001; USDOL & BLS, 2005 (calculated by the author of the present study).

In addition to full-time versus part-time employment status between men and women, gender-oriented occupations contribute to the persistent pay gaps. In the United States, for example, although women held half of all management, professional and related occupations (50.3%) in 2004,

their shares of specific occupations within this broad category varied by traditional gender-based orientations (Table 3). Only 13.8% of architects and engineers and 29.4% of physicians and surgeons were female. In contrast, 92.2% of registered nurses and 83.2% librarians were female. Traditionally female-oriented occupations tend to be lower-paid than are the male-oriented occupations.

**Table 3: Gender-Oriented Occupations in the United States (age 16 and over, 2004)**

| Who Does What | % of Positions Held by Women |
|---|---|
| Management, professional and related occupations | 50.3 |
| Physicians and surgeons | 29.4 |
| Dentists | 22.0 |
| Dental assistants | 96.5 |
| Registered nurses | 92.2 |
| Personal care and service occupations | 77.6 |
| Lawyers | 29.4 |
| Paralegals and legal assistants | 86.4 |
| Postsecondary teachers | 46.0 |
| Elementary and middle school Teachers | 81.3 |
| Preschool and kindergarten teachers | 98.1 |
| Librarians | 83.2 |
| Architects and engineers | 13.8 |
| Clergy | 15.0 |
| Construction Trades | 7.7 |
| Firefighters | 5.1 |

Source: Adapted from UDDOL & BLS, 2005.

## STATE LEGISLATION AND CORPORATE PRACTICES

Although there are both cultural norms and occupational traditions influencing gender equity and career paths, socioeconomic changes, state legislations, and corporate policies since the 1950s have made numerous attempts to address equity and diversity issues in the workplace. In the United States, Equal Pay Act (1963), Civil Rights Act (1964), its amendment Title VII (1972), Civil Rights Act (1991) and other equal employment opportunity related regulations prohibit employment discrimination on the bases of race, gender, ethnicity, religion, color, age, disability, pregnancy,

national origin, and citizenship. There are also affirmative action programs that attempt to correct past systematic discrimination against women and minorities. Similar efforts and progress have been made among European industrial societies. Organizations, domestic or multinational, must be aware of state legislations governing EEOA related issues and ensure compliance in managing the workforce diversity and organizational justice.

Western industrial societies have a long-standing interest in balancing paid work and family life, but patterns of work-family arrangements differ across cultures. Previous cross-cultural research found cultural relativity of role priorities a significant factor influencing sources of work versus family related role pressures and patterns of work-family relationship experienced by employees in different societies (Schein, 1984; Yang, 2000, 2005). In comparison, Americans tend to compartmentalize work and family life domains, and when in conflict, they tend to place work ahead of personal or family lives. The Europeans favor the term "work-family reconciliation", and they seldom work extensive overtime. In Finland, a femininity-oriented society, there is an emphasis on gender equity, and men are expected to spend time with their families. They may feel guilty if they neglect the family because of work, leading to similar levels of work-family conflict between employed men and women (Kinnunen & Mauno, 1998).

Based on socioeconomic changes, cultural norms, state legislations, and corporate practices, several work-family arrangements can be distinguished among western industrial societies. Those arrangements represent both convergence and divergence in attempts to achieve gender equity and work-family balance.

**Flexible Work Arrangements**

Flexible work arrangements consist of flexible work hours, part-time options, job sharing, and flexible workplace. As shown in Figure 1, women by higher percentage hold part-time jobs in European industrial societies (77.1%) than in the United States (68%).

**Leave Arrangements**

Leave arrangement consist of maternity leave, paternity leave, parental leave, adoption leave, leave for family and medical reasons, and career break plans. In comparison, many of those arrangements are regulated by state legislations in European industrial societies. In Sweden, for example, parental leaves are shared between mother and father for up to 480 working days per couple for each child at 80% of their salary (Rhoads, 2002). In the United States, Family and Medical Leave Act (1992) allows eligible employees to take unpaid leave for up to 12 weeks per year for childbirth, adoption, or illness.

### Care Arrangements

Care arrangements include childcare and eldercare resource and referral, financial assistance, workplace care facilities, and consolidating work schedules, vacations or holidays with school breaks and summer camps. Europeans by average have 6 weeks' paid vacation annually, while Americans are known as workaholics, with an average of two weeks' paid vacation.

### Supportive Arrangements

Supportive arrangements include both formal policies and informal accommodation for work-family balance, such as employee counseling, management training and support on work-family coordination, and integration of family-friendly practices into the corporate culture. There are empirical evidence in the United States that family-supportive leadership styles (e.g., listening empathy and behavioral accommodation) are positively related to employee performance and personal well-being (Yang 1993). In Sweden, there is no need for employers to provide childcare arrangements because of a substantial public day care system. In the Swedish context, measures encouraging fathers to take the advantage of the parental leave policy may fall under supportive arrangements and help enhance the family-friendly corporate culture.

## BARRIERS TO GENDER EQUITY AND EFFECTS OF THE GLASS CEILING

At the organizational level, differences in gender equity and pay gaps are affected by two major processes. One process includes some gender-specific factors in the treatment of equally qualified men and women for job assignments and career advancement. Another process regards equity in wages and wage growth according to values the labor market and the organization place on various labor skills. Across cultures, centralized wage-setting institutions tend to reduce inter-firm and inter-industrial wage variation and are often associated with conscious policies to raise the relative pay of low-wages regardless of gender (Blau & Kahn, 1992). Such efforts may indirectly reduce the gender pay gap. Comparing with European industrial societies, pay settings in the United Sates are far less centralized, a factor contributing to pay gaps. Despite some dramatic reduction since the 1950s, gender-based pay gaps are averaged higher in the United States (76%) than in the Scandinavian countries (over 80%) and are also higher than the averaged gender pay gap among industrial societies (78%) in the European Union (Blau & Kahn, 1992; EIRO 2001).

Taking the Wal-Mart Stores Inc. as an example, men dominate the higher-paying store management jobs, while women perform more than 90% of the low-paying cashier jobs (Zellner, 2003). Women also earn less than men in the same jobs, despite the fact that women account for 65% of hourly workers in the company, tend to have longer seniority, and are generally ranked higher on performance ratings than their male counterparts. As shown in Table 4, as women move

up into higher managerial positions, gender-based pay gaps rise continuously, from 5% less at the bottom to 33% less at the top. Those data demonstrate systematic inequity between equally qualified men and women throughout the organizational hierarchy, the "glass ceiling" in the workplace.

**Table 4: Wal-Mart's Gender-based Pay Differentials**

| Job Categories | Average Annual Earnings b 2001 | | | | |
|---|---|---|---|---|---|
| | No. of Employees a | % of Women | Male Salaries | Female Salaries | Gender Gap |
| Regional VP | 39 | 10% | $419,400 | $279,800 | .67 |
| District MGR | 508 | 10 | 239,500 | 177,100 | .74 |
| Store MGR | 3,241 | 14 | 105,700 | 89,300 | .84 |
| Assistant MGR | 18,731 | 36 | 39,800 | 37,300 | .94 |
| MGMT Trainee | 1,203 | 41 | 23,200 | 22,400 | .97 |
| Dept Head | 63,747 | 78 | 23,500 | 21,700 | .92 |
| Sales Associate | 100,003 | 68 | 16,500 | 15,100 | .92 |
| Cashier | 50,987 | 93 | 14,500 | 13,800 | .95 |

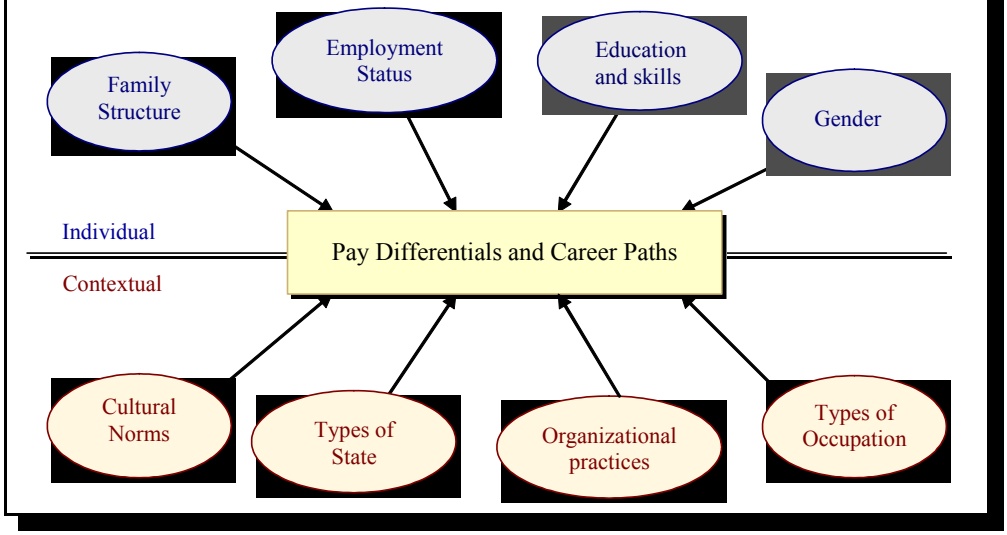
Source: a. full-time, b. including bonuses. Based on Business Week, March 3, 200, pay gaps were calculated by the authors of the present study.

## MULTIVARIATE FACTORS FOR PAY EQUITY AND CAREER PATHS

Integrating the concepts of gender equity and work-family relationship discussed above, a framework containing multivariate factors can be developed to further explore gender-based pay gaps and career patterns across borders. Contextual variables include cultural norms (e.g., masculinity versus femininity, and work versus family role priority), types of regime (e.g., social-democratic welfare states, liberal/market-oriented states, or conservative/traditional states), gender-oriented occupations (e.g., career patterns and values placed by the labor market), and organizational practices (e.g., formal and informal work-family arranges, and EEOA related programs to address gender equity). Individual variables include gender, family structural difference (e.g., single versus married, nuclear versus dual-earners, etc.), education and skills (labor quality and job-related qualifications), and employment status (e.g., full-time versus part-time). Several propositions can be made from the framework.

**Figure 2**

**Socio-cultural Factors for Pay Equity and Career Paths**




*Proposition 1:* *Cultural Norms and Gender Equity in the West*

a. In a femininity-oriented society, gender roles are less distinct and men and women are more likely viewed as equals, and therefore, they tend to experience smaller gender-based pay gaps than in a masculinity-oriented society.

b. In a masculinity-oriented society, gender roles are more distinct, and men are more likely viewed as the primary breadwinner, and therefore, occupations tend to be more differentiated by gender than in a femininity-oriented society.

*Propositions 2:* *Cross-cultural Work-family Relations in the West*

a. Increased women participation in the workforce is a global phenomenon, but patterns of work-family interface vary across the western industrial societies to the extent that employed men and women in liberal/market-oriented societies tend to be exposed to a higher degree of competition in the workplace and are expected to take more personal responsibility for work-family balance than their counterparts in social-democratic or conservative/traditional societies, regardless of gender.

b. Employed men and women in liberal/market-oriented societies tend to be exposed to a higher degree of competition in the workplace to the extent that the market

forces and corporate norms tend to have greater impacts on wages and wage growth than in socio-democratic societies.

*Proposition 3: Trends in Gender Equity and Work-family Arrangements*

a. Government intervention and market forces interact to determine the value and the division of labor by gender to the extent that gender-based pay gaps will be narrowed down more effectively in social-democratic societies than in liberal/market-oriented societies or conservative/traditional societies in western industrial societies.
b. Government intervention and market forces interact to determine the value and the division of labor by gender to the extent that work-family arrangements will be more equalized between employed men and women in social-democratic societies than in liberal/market-oriented societies or conservative/traditional societies in western industrial societies.

*Proposition 4: Constituencies in Work-family Reconciliation*

a. The role of state in work-family issues will be greatest in social-democratic societies as compared to other Western industrial societies.
b. The role of family and community in work-family issues will be greatest in conventional/traditional societies as compared to other Western societies.
c. Work-family issues will reveal as a competitive advantage and thus tend to be left to individual organizations in liberal/market oriented societies.

## CONCLUSION AND DISCUSSION

This study has explored and compared significant cultural dimensions and socioeconomic conditions that mark differences in gender-based pay differentials and career patterns in different societies, with special attention to the United States and selected European industrial countries. Factor conceptualizations based on previous research and highlights from recent national and regional statistics shed light on theory building and hypotheses testing in gender equity and work-family related issues, and thus contribute to a better understanding of cross-cultural differences in gender-based pay gaps, career paths, and work-family related experiences. The study has also generated implications and suggestions for effective organizational adaptation and policymaking within the context of globalization and socioeconomic changes. Emerging issues addressed in the study include cross-cultural value differences regarding gender role and family, types of regime and the role of state in work-family arrangements, impacts of family and gender on organizational justice, equal employment opportunity and quality of life issues, statutory provisions in different

societies, and effective formal versus informal work-family arrangements and policies in address gender equity and career opportunities in the workplace.

Through theory building and factor conceptualization, this study has developed a multivariate framework that helps to explain how cultural values, state legislations, socioeconomic conditions, corporate practices, and individual differences such as gender and family interact to influence pay gaps and career patterns in different societies. This framework of course calls for further refinement and propositions originated from the framework call for future research and empirical testing.

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# GLOBALIZATION AS RADICAL ECONOMIC TRANSFORMATION: CRITICAL IMPLICATIONS

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## ABSTRACT

*Globalization is a highly complex process of enormous significance for business organizations across the world. However, compared to the research attention received by globalization in several other social scientific disciplines, the topic seems to have remained somewhat under-studied within business scholarship itself. This article, accordingly, seeks to make a contribution to business research by way of offering a comprehensive conceptual discussion of different aspects of economic globalization, and what these might imply for business. Toward that end the article discusses the major processes that constitute the phenomenon of economic globalization, their potential effects and consequences, and the implications of globalization for businesses and management. The article suggests that the dynamics of globalization may be seen as leading the way to a radical transformation of the entire economic landscape of the world. Thriving in such a brave new economic world will require an extraordinary degree of creativity and ingenuity, and a willingness to give up established patterns of thought and old mindsets on the part of individual firms.*


## INTRODUCTION

Globalization is widely viewed as a highly complex process of enormous significance for business organizations across the world. However, researchers have also noted that compared to the attention globalization seems to have received in some of the other social scientific disciplines (e.g., economics, political science, sociology, or anthropology) the topic remains surprisingly under-studied within business scholarship itself (Jones, 2003; Parker, 2003). Accordingly, this paper seeks to make a contribution to business research by way of offering a comprehensive conceptual discussion of different aspects of economic globalization, and what these might imply for business. Toward that end the paper discusses: (1) the major processes that constitute the phenomenon of economic globalization, (2) their potential effects and consequences, and (3) the implications of economic globalization for businesses and management.

Globalization is a much discussed topic with an extensive popular as well as scholarly literature, the latter in turn stretching across a range of different disciplines. Not surprisingly, perhaps, there is considerable disagreement among analysts about the overall nature and significance

of the phenomenon. Even the definition of globalization is a matter of some debate, with Parker (2003) pointing out that there already exist some 35 different definitions of the term. In general, however, scholars tend to agree that globalization needs to be viewed as a multi-dimensional phenomenon involving not only economic aspects but also cultural, political, technological, ideological and similar other features (Appadurai, 1996; Held & McGrew, 2003; Singh, 2005; Stiglitz, 2002; Pieterse, 2004). The specific focus of this paper extends only to the economic aspects of globalization.

Economic globalization may be conceptualized as the "growing economic interdependence among countries as reflected in increasing cross-border flows of … goods and services, capital, and know-how" (Govindarajan & Gupta, 2000). Much has been written on the long history of economic globalization, with scholars pointing to the various phases or waves of globalization occurring over the past several centuries (Arrighi, 1999; Held, McGrew, Goldblatt & Perraton, 1999; Robertson, 1992). The focus of this paper is on the contemporary phase of economic globalization, a process seen as beginning during the post-World War II period and gathering substantial momentum since the decades of the 1970s and the 1980s. The accelerating pace of the current phase of economic globalization is attributed to a number of factors, including technological advances in the areas of transportation, telecommunication and information processing, as well as political and ideological developments (Friedman, 2005; Govindarajan & Gupta, 2000; Jones, 2003; Prestowitz, 2005).

The remainder of this article consists of four sections. The first section provides a brief overview of current business research on globalization. Thereafter, the sections that follow the literature review discuss in turn (a) the key constitutive processes that together make up the overall phenomenon of economic globalization, (b) the major effects and consequences of economic globalization, and (c) some critical implications of economic globalization for business organizations.

## LITERATURE REVIEW

It was noted in the introductory section of this article that, compared to several other social scientific disciplines, there appears to be a relative dearth of research on globalization in the field of business. It is certainly not the case that globalization is completely missing from the agenda of business scholarship; nevertheless, current business research on globalization does appear to be somewhat thin. This section of the article offers a brief outline of current business research focusing upon economic globalization. It is worthwhile pointing out here that, mainly for reasons of space, the following literature review is primarily designed to identify certain important tendencies in the existing business scholarship on globalization, rather than to compile an exhaustive inventory of business research on the subject.

It may be useful to begin this literature review by looking at a few of the works that include somewhat broad and generalized considerations on globalization (e.g., Jones, 2003; Ohmae, 1989;

Parker, 1996, 2003). For instance, conceptualizing the entire phenomenon of globalization primarily in economic terms, Jones (2003) examines the broader contours of economic globalization, and overviews such issues among others as the changing nature of the global economy, major drivers of globalization, the role of transnational corporations in globalization, and so on. Somewhat in contrast to Jones (2003), however, the works by Parker (1996, 2003) refuse to see globalization exclusively in economic terms, emphasizing instead its relatively multi-dimensional and somewhat unknown nature, and seek to raise new questions about globalization rather than to provide definitive answers. Ohmae's (1989) highly-cited *Harvard Business Review* article, on the other hand, appears to have been among the early analyses of globalization that sought to examine the consequences of globalization for the weakening of national boundaries, and the implications of this development for management. The debate about the effective 'disappearance' (or otherwise) of national borders under intensifying globalization continues to engage the attention of researchers in business (see, e.g., Mir, Mir & Wong, 2006) and other fields (Held & McGrew, 2003).)

The challenges presented to business firms by globalization serve as another important line of inquiry in business research. Several business researchers view economic globalization as posing a range of serious challenges for management, and seek to offer an understanding of the nature of such challenges, as well as some advice to companies for effectively responding to those challenges. Parker (1996), for instance points out that globalization will have revolutionary consequences touching upon "every sphere of life" (p. 484). According to Parker (1996), globalization raises new challenges for business and management in such areas as organizational strategy, social responsibility, and organizational structure. Similarly, Prahalad (1990) offers an understanding of some of the managerial as well as intellectual challenges posed by globalization. In a parallel fashion, the theme of intellectual and cognitive challenges is taken up by Govindarajan and Gupta (2000) as well, who emphasize the pressing need for business firms and their managements to develop a global mindset. Along somewhat similar lines, Meyer (2006) uses a case study of two different manufacturing firms to analyze the strategic challenges posed by globalization, and offers the notion of 'globalfocusing' (i.e., transforming the firm from a diversified conglomerate to a global specialist focusing upon narrower niche markets) as a strategic response to the competitive challenges emerging as a result of economic globalization. Offshoring and outsourcing have also received the attention of some business researchers (e.g., Doh, 2005; Farrell, 2005; Levy, 1997, 2005). Among other things, these researchers attempt to evaluate the pros and cons of offshoring/outsourcing, and examine whether these activities confer benefits on all sides and to multiple stakeholders, or whether such activities produce differential effects and consequences for different groups.

Some of the current business research on globalization focuses upon two somewhat interrelated questions, namely, (a) what are some of the key issues that a firm needs to keep under consideration in the process of 'going global', and (b) how might the decision to 'go global' impact different firms. With respect to the first of these questions, Hordes, Clancy and Baddaley (1995),

for example, provide a brief primer for global start-ups. Maruca (1994), on the other hand, offers advice about the right way to go global on the basis of an interview with the CEO of a major company, while Kim and Mauborgne (1991) discuss certain implementation issues for global strategies. In a somewhat related vein, the choice of different modes of entry into foreign markets has received the attention of some business researchers. Among other things, this stream of research investigates the effect of different issues such as ownership, location and internationalization factors (Agarwal & Ramaswami, 1992), CEO experience (Herrmann & Dutta, 2006), and so forth on specific strategic decisions made by firms with respect to the choice of different modes of entry. Sebenius (1998, 2002), on the other hand, offers some advice to managers about successful cross-border negotiations and acquisitions. As regards the effects on different firms of their decision to go global, Athanassiou and Nigh (1999), for instance, examine the impact on a firm's top management of the firm's attempts to internationalize. Similarly, Hitt, Hoskisson and Kim (1997) study the impact of a firm's decision to diversify internationally on the firm's performance and innovation. The next section of the article examines some of the key processes that constitute the phenomenon of economic globalization.

## GLOBALIZATION: KEY CONSTITUTIVE PROCESSES

Economic globalization may be understood as consisting of three major sets of somewhat distinct but overlapping processes, namely, (a) globalization of production, (b) globalization of finance, and (c) globalization of trade (Castells, 2000a). Respectively, these three sets of processes encompass significant changes that seem to have taken place, at the global level, in (a) the ways in which production of goods and services is organized, (b) in the nature and structure of the international financial system, and (c) in international trade activities. For instance, during the last several years, globalization of production has been accompanied by a massive jump in the total quantum of foreign direct investment, increased role and significance of transnational corporations in the world economy, and growth of far-flung international production networks. Similarly, globalization of finance has involved a growing trend toward integration of financial markets on a world-wide scale, relatively free movement of capital across national boundaries, and emergence of a host of novel financial instruments. Finally, globalization of trade has resulted in increasing significance of international trade in overall economic activities of the world, changes in geographical patterns of international trade, and emergence of major regional trade groupings such as the EU, NAFTA, ASEAN, and Mercosur. This section of the paper presents a brief discussion of the nature and significance of these processes.

The globalization of production over the last few decades appears to have involved three inter-related dynamics of considerable importance: (a) a huge growth in the total amount of foreign direct investment taking place in the world, (b) rising significance of transnational corporations in global economic activities, and (c) development of wide-spread international production networks

in both manufacturing and services sectors of the economy (Jones, 2003). The term foreign direct investment (FDI) refers to those private flows of capital that take place across national boundaries, and are directly employed for purposes of ownership of productive assets like factories, capital equipments and so forth. To get some idea of the explosive growth of FDI resulting from globalization, it may be useful to note that between the years 1980 and 1995 there was a four-fold increase in the total amount of FDI world wide (Castells, 2000a). In terms of geographical origins and destinations, FDI displays some interesting patterns. For instance, most FDI tends to originate in a relatively small group of industrialized countries (ICs) represented by the United States, Japan, Germany, the United Kingdom, France, the Netherlands, Sweden and Switzerland. Moreover, in terms of geographical destination, a significant proportion of total annual FDI is directed at other ICs rather than at the economies of the Third World. Indeed, in relative terms, the decades since the 1960s have even seen a further geographical concentration of FDI in the ICs: in 1960 the FDI stock in the ICs represented about 66 percent of the total global FDI stock; by the late 1990s, however, that proportion had grown to almost 75 percent of the total (Castells, 2000a). Somewhat similar figures for concentration of FDI stock in the ICs continue to persist to the present day (UNCTAD, 2005).

Notwithstanding the above-noted historical pattern of concentration of FDI in the industrialized economies, there is evidence that some Third World countries are increasingly becoming important FDI destinations, with the result that now the Third World as a whole accounts for about 35-40 percent of total annual global FDI. In 2004, for instance, FDI inflows into the developing economies represented about 36 percent of aggregate global FDI inflows (UNCTAD, 2005). Economic globalization, in other words, is leading to a considerable reorientation of the geographical destination of FDI. Despite such ongoing geographical reorientation of FDI towards Third World destinations, however, the benefits of FDI seem to be mostly restricted to a handful of countries, and fully 80 percent of the annual FDI directed toward the Third World goes to only 20 Third World countries. By far, moreover, China has been the largest Third World recipient of FDI for a number of years. As a matter of fact, with FDI inflows into the country reaching $53.5 billion in 2003, China replaced the United States as the world's leading destination for FDI (UNCTAD, 2004). In 2004, FDI inflows into China totaled $60.6 billion, and represented about 26 percent of the aggregate global inflows of FDI into all the developing countries taken together (UNCTAD, 2005). This pattern of concentration of FDI in a fairly small number of Third World economies may likely have important consequences for overall Third World industrial development and for the shape of the emerging global economy.

Globally, the most important vehicle for FDI is provided by the large transnational corporations (TNCs) headquartered in a relatively small number of ICs. During recent years, however, some of the TNCs located in the larger Third World economies (e.g., China, India, Brazil, etc.) have also started undertaking FDI in other countries. It is estimated that in 2001 there were some 65,000 TNCs with total sales of $18.5 trillion. Today TNCs account for about 20 percent of

world production and over 70 percent of international trade (Held & McGrew, 2003). Interestingly, about half of the international trade of the TNCs takes place between branches of the same firm. With economic globalization gaining greater momentum during recent decades, TNCs have considerably grown in importance and today the revenues of the larger TNCs frequently outstrip the gross domestic products (GDP) of many national economies. The increasing economic power and importance of TNCs holds major implications for their functioning.

One of the more interesting developments linked to economic globalization has been the tendency among TNCs to increasingly organize their production processes around internationally dispersed production networks (Gereffi, 2002; Gereffi & Korzeniewicz, 1994). This development represents an important departure from earlier arrangements under which production processes tended to be organized largely within national boundaries. Variously referred to as international production/supply chains, global commodity chains or vertical production networks, these relatively newer production arrangements have evolved over the last few decades, and primarily comprise market-based networks of global as well as regional scope, that are organized by the large TNCs through relying mostly upon contracting and sub-contracting (rather than ownership) of various labor and production processes across the world. International production chains can be either producer-driven (which is usually the case in capital and technology intensive industries like heavy machinery, automobiles, aircraft, superconductors, etc.) or buyer-driven (which are mostly employed for labor intensive production of consumer goods such as apparel, consumer electronics, toys, footwear, etc.). In producer-driven chains, it is the large manufacturing TNCs that take on the leadership role in organizing and coordinating the chains. In buyer-driven chains, on the other hand, the central coordinating role is assumed by major global retailers and marketers. As a result of such producer- and/or buyer-driven international production chains, however, global production of goods and services increasingly takes place through widely-scattered network arrangements that have created something akin to a global web of productive activities (Reich, 1991). All in all, the globalization of production involving explosive growth of FDI, increasing significance of TNCs, and growth of far-flung international production networks has led to a major transformation of the productive landscape of the world.

As already noted, economic globalization involves not only globalization of production but also globalization of finance. Hence, in tandem with the developments taking place in the sphere of production of goods and services, economic globalization has also been accompanied by noteworthy changes in the nature and structure of the international financial system. The post-World War II international financial architecture established under the Bretton Woods Agreement had instituted a system of fixed exchange rates across different national currencies. However, ever since the breakdown, during the 1970s, of the aforementioned fixed exchange rate system, the international financial system has increasingly become globalized, and shown a growing tendency toward world-wide integration of financial markets, relatively free movement of capital across national boundaries, and creation of a range of new and innovative financial instruments (Govindarajan & Gupta, 2000;

Singh, 1999). As a result of such globalization of finance, today's businesses increasingly operate in a world of globally integrated and inter-dependent capital markets in which developments (e.g., interest rate changes, or stock market movements) in one part of the world quickly transmit their effects world wide. In addition, globalization of finance has resulted in markedly increased levels of international financial transactions, including growing portfolio investments (i.e., ownership of stocks, bonds, and a variety of other financial instruments) across national boundaries. Lastly, financial globalization has led to a staggering explosion of currency trading, which is largely unrelated to international trade or investments. Today international trade represents less than 2 percent of total global currency movements, the latter being the results mostly of search for arbitrage opportunities as well as short-term speculative profits (Singh, 1999, 2005).

In addition to significant developments pertaining to the spheres of production and finance, economic globalization has also implied important changes with respect to international trade. To begin with, as a result of globalization the importance of international trade in overall global economic activities has markedly increased. For instance, while in the late 1960s, the value of international trade represented only 10 percent of total global economic output, by the late 1990s that proportion had grown to 25 percent (Govindarajan & Gupta, 2000). Similarly, while in 1985, international trade accounted for only about 18 percent of the gross domestic product (GDP) of the United States, by the late 1990s that share had increased to 24 percent (Castells, 2000a). In terms of value, trade in manufactured products accounts for about 75 percent of the total international trade, while trade in services and primary commodities respectively represent 20 percent and 5 percent of total international trade.

Given such preponderance of manufactured products in the total value of international trade, it is not surprising that industrialized economies (ICs) dominate international trade. At present, the ICs account for about 71 percent of total global exports, and some 80 percent of total global manufactured exports. As a result of globalization, however, there are also signs of increasing geographical diversification of international trade. Specifically, in relative terms, while exports of ICs to other ICs have declined, exports of Third World countries to other Third World countries have increased. In other words, the forces of globalization are creating important and ongoing changes in the geographical patterns of international trade. Finally, globalization of trade has been accompanied by development of major regional trade blocs such as the European Union (EU), North American Free Trade Agreement (NAFTA), Association of South East Asian Nations (ASEAN), and Mercosur (Maniam, Leavell & Mehrens, 2003). Interestingly, therefore, globalization of trade has witnessed a parallel and important dynamic characterized by growing regionalization. Such regional arrangements are designed to give further impetus to trade among member countries of the respective trading groups. At the global level, the World Trade Organization (WTO) as the successor to GATT (General Agreement on Tariffs and Trade) serves as the forum for conducting trade negotiations and devising multilateral agreements for promoting international trade. The next section of the paper examines some of the important effects and consequences of economic globalization.

## GLOBALIZATION: MAJOR EFFECTS AND CONSEQUENCES

The effects of globalization have been far-reaching, and a radical transformation of the economic landscape of the world seems to be underway. First of all, the very structure of the global economy has been changed (and continues to change) as a result of offshoring/outsourcing and the emerging new international division of labor, flexible manufacturing, and the increased significance of the services sector. Such structural reconfiguration is accompanied also by signs of an ongoing shift in the very center of gravity of the global economy (Hacksworth, 2006; National Intelligence Council, 2004). For instance, by the year 2020 according to some projections (e.g., Wilson & Purushothaman, 2003) the actual output of goods and services in the rapidly growing BRIC countries (Brazil, Russia, India, and China) may collectively be larger than the combined output of the G-6 countries (U.S.A., Japan, Germany, U.K., France, and Italy) who currently dominate the world economy. Globalization is also leading to changes in income and wealth distribution both within and between different countries (Castells, 2000b). Finally, globalization may have important environmental consequences as well (Barnett, 2004). This section of the paper seeks to shed light on some of the more important effects and consequences of economic globalization.

With respect to the ongoing economic reconfiguration of the world, scholars have identified a number of important trends, including post-industrialism, post-Fordism, and the accelerating new international division of labor, that are leading to fundamental changes in the nature and structure of the overall global economy. In brief, the notion of post-industrialism (Bell, 1973) points toward certain key developments currently taking place that suggest that we might be in the process of leaving behind a world mostly shaped by forces coming out of the 18$^{th}$ century industrial revolution, and gradually moving in the direction of a new world characterized by ever-increasing focus on knowledge and information in economic activities, growing relative importance of the services sector (as compared to the manufacturing sector) in the overall economy, and the coming of the so-called information society. In a somewhat similar fashion, the concept of post-Fordism (Aglietta, 1979; Sayer, 1989) helps us understand the changing nature of the global economy by way of identifying and analyzing certain important developments occurring within the manufacturing sector of the economy. Fordism (or Fordist manufacture) is a term commonly used to refer to the system of mass production that emerged as a result of the industrial revolution and Tayloristic scientific management. The Fordist system of mass production is largely characterized by its reliance upon economies of scale, fairly strict division of labor, and large investments in relatively inflexible plant and equipment. In contrast to the Fordist system of manufacturing, post-Fordism is distinguished by its emphasis on flexible manufacturing and flexible work arrangements, and a switch from mass production (economies of scale) to batch production (economies of scope). Post-industrialist and post-Fordist trends represent important features of globalization that are effecting significant changes in the nature and structure of the world economy.

The new international division of labor (NIDL) refers to another trend that is seen as transforming the nature and structure of the global economy (Frobel, Heinrichs & Drey, 1980). NIDL as a concept draws attention toward certain changes in the currently evolving global economy that set the latter apart from the old global economic system characterized by the so-called 'classical' international division of labor (CIDL). Under CIDL, the less-industrialized developing countries (countries of the so-called global 'South') primarily served as providers of raw materials for the industrialized countries (countries of the so-called global 'North'), and global manufacturing was mostly concentrated in the 'North'. Under NIDL, however, several countries of the 'South' are also becoming important sites for manufacturing. In this regard, China has lately emerged as a key Third World manufacturing location for the global economy. Somewhat analogous to China's role in global manufacturing, India is now often seen as an important location for many service-related activities for global economy. To a considerable degree, the emerging NIDL may be seen as a product of the offshoring (of manufacturing) and outsourcing (of services) activities undertaken by businesses operating in the industrialized countries of the 'North'. In addition, however, NIDL also represents an emergent outcome resulting from the autonomous economic development activities initiated by several countries in the 'South'.

Over the last few years, a number of important studies have sought to evaluate the significance of globalization for ongoing shifts in the center of gravity of the global economy (Ahya & Xie, 2004; Ahya, Xie, Roach, Sheth & Yam, 2006; Hacksworth, 2006; National Intelligence Council, 2004; Wilson & Purushothaman, 2003). Generally undertaken on behalf of prominent organizations like the Central Intelligence Agency (CIA), Goldman Sachs, Morgan Stanley, and Price Waterhouse Coopers, these studies shed valuable light on currently ongoing changes in the balance of global economic power. Without getting into the minute details of these studies, there seems to be a broad consensus of opinion among analysts that the global economy's center of gravity shows distinct signs of gradually moving toward the continental mass of Asia. In brief, this development may be seen as a result of a combination of Asian demographics and high rates of annual growth (often in the vicinity of 6-7 percent or higher) being maintained by such economies as those of China, India, and the ASEAN countries.

In addition to the remarkable ongoing economic expansion of many parts of Asia, the global economy is also being reconfigured as a result of the rapid economic growth of certain other countries including Brazil, Russia, and South Africa. Interestingly, BRIC as a term is increasingly being employed in contemporary discussions of global economic issues with a view to underscoring the growing role and significance of the expanding economies of Brazil, Russia, India and China. According to the Goldman Sachs study that popularized this term, the combined GDP of the BRIC economies is projected to exceed the combined GDP of the G-6 economies (i.e., U.S.A., Japan, Germany, U.K., France, and Italy) by 2020 in purchasing power parity (PPP) terms, and by 2039 in nominal U.S. dollar terms (Wilson & Purushothaman, 2003). Similarly, according to the same study, the Chinese economy is projected as overtaking the U.S. economy (and, hence, becoming the

largest economy of the world) by 2020 in terms of purchasing power parity GDP (i.e., actual output of goods and services), and by 2041 in terms of nominal U.S. dollar GDP. To put these projections in some perspective, it may be useful to note that in 2005 the nominal U.S. dollar GDP of China was only $4.5 trillion (as compared to the United States GDP of $12.5 trillion), and that in PPP terms, China's 2005 GDP amounted to only $8.6 trillion (World Bank, 2006). These projected shifts are generally regarded as representing a major rearrangement of global economic power with large-scale consequences for investment flows, creation of new demand, currency realignments, emergence of new reserve currencies, and geopolitical balance of power.

One of the more complex effects of globalization relates to ongoing changes in income and wealth distribution within and between different countries (Castells, 2000b; UNDP, 1999, 2005). The topic has generated intense debate (and a correspondingly large scholarly literature), and no attempt will be made here to offer minute analyses of different aspects of this issue. In general, however, there appears to be considerable agreement among scholars that globalization is a complex phenomenon that produces different effects on the economic well-being of (a) different countries, and (b) of different groups of people within individual countries. More specifically, globalization is generally seen as producing 'winners' and 'losers' across countries and individuals, with the result that (a) certain countries gain from globalization while others do not, and (b) even within each country, specific groups of people gain from globalization while other groups end up as 'losers' or 'victims' of globalization (Gelinas, 2003). In some ways, therefore, one of the net effects of globalization seems to have been growing economic inequality within and between different countries. For instance, the gap between the richest and poorest national economies has shown a widening trend over the last several years (UNDP, 1999, 2005) and, with the exception of a handful of countries, income and wealth inequalities between the richest and poorest sections of society within each country (including within most of the advanced industrialized countries) also seem to be growing (Castells, 2000b; Gelinas, 2003).

Last but not the least, economic globalization holds important consequences for the natural environment (Gelinas, 2003; Parker, 1996; Barnett, 2004). The last few decades have witnessed the growth of environmental consciousness in many parts of the world. This has been accompanied by increasing awareness of the deleterious ecological effects of a number of current economic and industrial practices. These ecological effects include growing problems of consumer and industrial waste, air and water pollution, global warming, depletion of non-renewable resources, threats to natural habitats, and so on. With globalization leading to further acceleration in the expansion of the world economy, there is considerable concern that many of these ecological problems might get further aggravated. Economic globalization, hence, might have important consequences for the quality and sustainability of our natural environment. All in all, therefore, the forces released by globalization and its varied dynamics have the potential of radically transforming our world and the world economy in a number of crucial ways. In the next section, the present paper explores some of the critical implications of economic globalization for business organizations.

## GLOBALIZATION: CRITICAL IMPLICATIONS FOR BUSINESS

For businesses around the world, the complex dynamics of globalization hold important implications, including the need for new approaches to strategy, preparing for significantly intensified levels of international competition, the importance of evolving fresh and innovative outlooks on business-government relations and corporate governance, and the necessity of developing a global mindset within individual firms (Govindarajan & Gupta, 2000; Jones, 2003; Parker, 1996, 2003). This section of the paper, accordingly, presents an analysis of some of the critical implications of economic globalization.

It may be useful to begin our discussion of the implications of globalization by noting that economic globalization tends to give rise to new sets of potential opportunities and threats for business firms. First of all, globalization implies that increasingly business firms have access to a world-wide market, with the result that the prospective customer base of companies has been radically enlarged. This is a product not only of simple demographics, but also of the rapidly growing purchasing power of the expanding middle class in several countries outside the advanced industrial economies. Along similar lines, globalization also implies that firms now have access to world-wide sources of not only raw materials, but also capital, technology, human resources, production facilities/locations and the like. While these developments offer new and profitable opportunities to individual firms, the same developments if better leveraged by rival firms can become sources of major threats. Hence, succeeding in an increasingly globalized world requires that, without exception, business firms must give serious and regular consideration to such questions as the extent of their optimal global market presence, and utilization of global sources of capital, technology, and similar other resources. This implies that, as a matter of routine, the strategy process of business firms must incorporate global thinking and the global element. In other words, globalization leaves business firms with no choice as regards the need to develop and institutionalize organizational processes, structures and mechanisms that facilitate strategic planning at the global level. This kind of strategic planning, moreover, must necessarily be inter-disciplinary in its orientation (Parker, 1996, 2003).

The accelerating pace of economic globalization also implies an ongoing intensification of the level of competition being faced by business firms (Friedman, 2005; Govindarajan & Gupta, 2000). There are several reasons for this development. First of all, with the large-scale commercialization and declining cost of advanced digital technologies, many more companies are now able to reap the benefits of these technologies, and thereby put pressure on the profitability of rival firms. Moreover, partly as a result of these selfsame technological developments, new business innovations are also much more susceptible to quicker competitive imitation. Hence businesses are finding it increasingly difficult to sustain the competitive edge gained through existing product and/or process innovations that differentiate them from their rival firms. Developments such as these have considerably added to the intensification of competition in several industries.

In addition to the above, as a result of increased global opportunities in a number of areas, more and more firms are being drawn into the competitive business arena. In the industrialized countries, such new competition may include completely new startups as well as outcomes of diversification efforts undertaken by existing firms. Besides, following the ongoing rapid industrialization and economic development of several Third World countries, an increasing number of new, efficient and successful companies (who are capable of offering tough competition to companies from the advanced industrialized economies) are emerging in many other parts of the world. Hence, in many industries the number of potential competitors has grown, and may continue to grow, and further intensify existing competition.

For businesses around the world, therefore, economic globalization may be seen as introducing a radically new competitive paradigm. Succeeding in this world of ever-intensifying competition requires developing capabilities for agile management as well as continual innovation through a number of means, including increasing customization to fit the evolving needs of individual customers, growing partnership and information sharing with suppliers, strategic alliances designed to facilitate entry into new market niches, developing core competencies that are not principally dependent on technologies that can be easily commercialized, and leveraging the firm's current knowledge to develop new knowledge-based products and services (Friedman, 2005; Govindarajan & Gupta, 2000). Moreover, such imperative for persistent innovation and management agility implies that business firms need to employ greater decentralization in decision making and hence, adopt relatively flatter and less bureaucratic organizational structures. Additionally, successful decentralization of decision making, as also knowledge-based innovation, requires that business firms pay serious attention to developing top quality human resources.

Globalization, moreover, also seems to hold important implications for changes in business-government relations and corporate governance. There appear to be a number of reasons for the changing nature of business-government relations under globalization. For instance, the increasing pace of financial globalization and emergence of a globally integrated financial market has meant new limits on the freedom traditionally enjoyed by governments of different countries to incur budgetary deficits. As a result, there seem to be fresh constraints on the ability of many governments to provide various types of social services to their populace. Hence, many social services that were conventionally seen as governmental responsibilities (from which the private sector was often barred), are now increasingly being opened up to private initiative in a number of countries. In other words, governments in many countries seem to be growing more dependent on private business to fulfill the formers' social commitments to the people.

On the other hand, it appears that globalization might also imply somewhat increasing dependence of business on governmental actions and support. To take just one example, the ongoing WTO negotiations that have taken place over the past several years and are likely to continue into the foreseeable future, currently provide one of the most important forums for deciding 'the rules of the game' for globalization. Such 'rules of the game' include a wide range of international laws

and regulations relating to tariffs, governmental subsidies, foreign investment, intellectual property, and so forth. By the very nature of things, these WTO negotiations can only take place among national governments, with the result that business in each country is critically dependent on government for protecting the interests of the country's private business during such rule-making negotiations. All in all, therefore, globalization is witnessing a significant redrawing of business-government relations in highly intricate ways. It needs to be noted, moreover, that it might not be appropriate to regard such ongoing redrawing of business-government relations as a process that is either merely increasing the dependence of governments on private business, or simply making the latter more dependent on the former. Rather, the renegotiation of business-government relations that seems to be accompanying economic globalization needs to be viewed as a complex process that is increasing the mutual interdependence of business and government on each other.

The growing interdependence between business and government often seems to give rise to new mutual expectations from one another. For example, over the last few decades, as government and society have become increasingly sensitized to the environmental consequences of economic and industrial activities, there are growing expectations for business to operate in environment-friendly ways. Similarly, in various parts of the world, there seem to be increasing expectations about the responsibility of business to attend to some of the negative societal effects of the pursuit of economic profit. For instance, in a number of forums, there are increasing appeals to business to be mindful of the societal consequences of the uneven nature of globalization (Parker, 2003; Singh, 2005). As noted earlier, economic globalization is a relatively uneven process that often impacts different countries and groups of people in different ways. Scholars have pointed out that, even within a single country, the effects of globalization might differ from region to region, province to province, city to city, and so on (Castells, 2000a, 2000b; Singh, 2005). Such unevenness of globalization often results in significant economic disparities even within those countries where the macro economic indicators suggest overall gains from globalization. This creates not only difficult economic problems, but sometimes may also lead to major social and/or political tensions within such countries. As a result, government and society in some countries are increasingly turning to the view that the benefits of globalization need to be distributed more evenly across different regions and groups of people, and that private business needs to actively cooperate in addressing this issue. Developments such as these imply that with accelerating economic globalization there may likely be a continuing need for fashioning new and innovative approaches to managing business-government relations. Such developments, moreover, also seem to raise important questions about whether wide-ranging changes in business-government relations might necessitate new forms of corporate governance that are more broadly stakeholder oriented.

Finally, economic globalization also implies the urgent necessity of developing a global mindset within individual firms (Govindarajan & Gupta, 2000). In brief, developing a global mindset means inculcating a sophisticated awareness of the deep interconnections and interdependencies that bind the world. Such awareness, it is important to emphasize, needs to extend

beyond merely economic matters, and also extend into social, cultural, political, and other spheres. Developing a global mindset also means cultivating sincere respect for different cultures, and a consciousness of the long and complex histories of the various peoples who inhabit our earth. Moreover, developing a global mindset signifies the forming of a sound understanding of the rapid changes taking place across the world in economic, cultural, political, geopolitical and similar other domains. In the absence of the kind of broad-based and multi-faceted understanding of the world proposed here, individual business firms might find it extremely hard to strategize in genuinely global terms. In conclusion, economic globalization is a complex and ongoing process of truly massive proportions that is radically altering the very nature of the world we inhabit. Surviving and prospering in this emerging brave new world will require an extraordinary degree of creativity and ingenuity, continual innovation, and a willingness to give up established patterns of thoughts and old mindsets on the part of individual firms and managers.

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# PLAYING AND PAYING ON THE INTERNET: ADOPTION DETERMINANTS FOR SPANISH GAMERS

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## ABSTRACT

*The online game industry has been one of the fastest growing businesses over the last few years. It is estimated that in 2008 online gaming will be the leader in Europe in terms of content spending. The purpose of this paper is to explore the drivers behind online game adoption among Internet users, focusing on the gamer's profile and Internet behavior based on data from an online survey. Our results show that purchasing decisions are irrelevant in terms of the users' personal characteristics and are more focused on the user's prior gaming profile. The introduction of new technology does not change the users' behavior, but it does allow current users to access that content more easily.*

## INTRODUCTION

Online gaming has been one of the fastest growing businesses over the last few years on the Internet. In Europe, online gaming ranks number two in consumer spending, only behind adult content and well ahead of the third ranked category (Jupiter Research, 2004a). The appearance of multiplayer games like Counterstrike or Everquest, the increasing presence of broadband connections, and the development of new mobile systems that allow for faster downloads of such games have allowed the category to maintain its success as a content aggregator in terms of usage and revenue.

Projections are also bright for the business. Jupiter Research (2004b) estimates that in 2008 online gaming will be the leader in Europe in terms of content spending, representing 28% of a market expected to be worth €2.3 billion, surpassing adult content and music downloads. Much of the attention on the literature in this area has focused on issues related to piracy and copyright protection (see, for example, Zhu, 2001; Zhang, 2002; Ting and Wildman, 2002; Domona and Yamazaki, 2004; Oberholzer and Strumpf, 2004) while little to no attention has been paid to consumer behavior.

The online game business can be divided up mainly into three areas: multiplayer online games (80% of the market), game downloads for different platforms (9%) and games on demand

that, although currently only representing a scarce 2.6% of the market, is growing strongly as new technologies and broadband access expand. A new area is also developing with the utilization of the web to pay for and download content for mobile terminals and game consoles. Regardless, all of these are influenced by strong network externalities. As gamers increase in number, a larger user base allows users to have more "fun" while representing for the industry an increased competitive advantage on complementary products suitable for marketing and transactions on the web (Liang and Huang, 1998).

As Majumdar and Venkataraman (1998) point out, network effects literature focuses on technology adoption decisions, technology compatibility decisions and decisions among competing incompatible technologies. In this paper we will focus on the first point, the decisions taken within the games market, as no previous studies have been conducted on why Internet users choose to start paying for content online.

The purpose of this paper is to explore the drivers behind online game adoption among Internet users, moving away from most of the studies on the issue that have focused on security, both in payments or privacy concerns as a driver behind the online purchase decision (Miyazaki and Fernandez, 2001; Furnell and Karweni, 1999; Baker, 1999; Liang and Huang, 1998) or research on the profile and Internet behavior of the game adopter on the Internet by using data that is rarely available to researchers.

Understanding the factors that drive that adoption and the consumer characteristics is important. As Internet, and specially broadband, penetration grows, companies like Sony, EA or Valve should focus their efforts on the users most likely to pay to play on line, promoting a more efficient usage of their marketing budgets.

The paper proceeds as follows. Section 2 describes the online game industry as a network process. Section 3 describes the data and summary statistics. Section 4 presents the methodology and discusses the results and its implications, and Section 5 draws some conclusions and avenues for future research.

## BACKGROUND AND RELATED STUDIES

In the game industry, development costs (R&D) are extremely high (a typical game for Playstation or Gamecube costs over $5 million to develop) and most of the platforms outsource new game development and marketing (Dhebar, 1994; Brandemburger, 1995). The success of their games depends, obviously, on the number of users, the companies' competitive advantage, the latter depending on their ability to enhance their reputation (Porter, 1998) and, specially, their ability to foment the consumers' loyalty by means of the reputation of their games (Klein and Leffler, 1981). Additionally, creating a network of users is a strategic asset for the company in order to gain this competitive advantage, bringing full benefits to the organization.

The network size of a company depends on its fixed user base; those who have already downloaded the game and are currently using it, creating a virtual community as described by Balasubramanian and Mahajan (2000), sharing a common bond as the computer game allows the users to exchange tips, experiences and knowledge, building ties among its members, and making the community more attractive to new users, who will be willing to pay a premium on those products that already have a large network of users (Brynjolfsson and Kemerer, 1996). Companies need to create and build those networks because their own existence depends on it (Kawasaki, 1999; Rosen, 2000), making the product successful independently of its quality (David, 1999). Loyalty among the games' users is especially relevant on assets with a short life span and large marketing expenditures (Klein and Leffler, 1981; Wernerfelt, 1984).

To develop those networks, the companies have to overcome the first obstacle: the adoption of their games as a new technology by an ever-more individualistic consumer, informed and independent, with less time to spare (Lewis and Bridger, 2001). Developing this network is central for companies to spread the word about its new product within the segment that is crucial for their games' diffusion. The adoption of product role models and the product's continuous usage represent a step towards the success of the diffusion, as individuals may reject the innovation after the first use, truncating the possibility of any further development of the network (Robertson, 1971; Rogers, 1995). Therefore, the efforts of the company must be directed at attracting innovators that will allow for the deepening of their product's use.

During the adoption process, prospective users become aware of the innovative technology, its advantages and benefits and its drawbacks, making the decision to continue using it in an environment where, unlike with other information system applications, they have different choices, becoming not just users, but consumers (Kauffman and Walden, 2001). The faster individuals acquire knowledge about the product and experience it first hand, the faster the adoption occurs, the continuous use of the technology being the key step behind the process. How to define it varies across products and users because it is heavily dependent on the characteristics of the product.

As Rogers (1995) points out, the innovations consist of several attributes: i) the advantage with respect to previous methods; ii) its compatibility and complementariness with previous technologies; iii) the complexity in learning to use the new technology, iv) the possibility of testing the new product; and v) being able to observe the acquired benefits, allowing the first adopter to transmit his/her experience to other prospective users, thus expanding the network and increasing as the ability to observe and appreciate the game's benefits (Chakravarty and Dubinsky, 2005). This psychological process is obviously determined by cultural factors that depend on country, group, etc, making it difficult to translate results from one region to another, in the same way that Internet adoption differs widely within regions or even cities (Choi and Geistfeld, 2004). In this sense the first hypothesis we are going to test is whether *Demographic and geographical characteristics are relevant on whether to pay or not for products on line.* Similarly, we expect that the data will show

a digital divide between regions with a greater Internet penetration and users more propitious to innovations.

Companies interested in succeeding in this market need to understand what kind of user they need to market to in order to build a network that will ensure its success (Lewis and Bridger, 2001), to analyze the profile of the user we will check our second hypothesis, if *Strong usage of computers and the Internet is a key driver behind online game spending.* Lee, Eastwood and Lee (2004) quote this issue as key for the adoption or the likelihood of the adoption of Computer Banking, as it supposes that users with greater computer usage will be more keen on trying new, related products.

Finally, we expect that game adoption will depend on the previous usage of games and the gamers' greater likelihood to adopt online gaming as a new channel. For example, when adopting a financial innovation, Hayashi and Klee (2003) and Gowrisankaran and Stavins (2004) demonstrate that it is a key aspect. In this case we will test if *heavy game users are more likely to use Internet as an additional channel to acquire games.*

## DATA

The data for this study was obtained via an online survey carried out by Yahoo! Spain in April 2004. The questionnaire was made available to its users via a banner campaign with a frequency set at one, that is, the users were only offered the survey once, installing a cookie in the user's computer once the survey banner was viewed and so avoiding users filling out the survey more than once.

Out of the total 425.000 banners shown, 394 users answered the questionnaire. The sample was roughly equally distributed between male and female respondents. The larger group was made up by users between the ages of 25-34, the cumulative representing between 34 and 54.6% of the total number of users. A little over 40% (40.6%) lived in either one of the regions with the greatest Internet penetration in Spain (Catalonia and Madrid). Also interesting to note is that 55.2% of the users connected at least once a day to Internet and mostly from home (83.6%).

Out of the total, 104 were missing one or several of the 24 questions asked (of which only 11 were relevant for this study). We discarded those incomplete questionnaires, reducing the sample to 290 users. Similar questions were asked to explore the decision factors behind buying games online for their use on the web itself, for mobile telephones and game consoles. By including the three platforms, we can cover the main game interfaces, taking into account that the profile may provide significantly different results as the profile of users differs. Jupiter Research (2004c) points out that spending on any of these platforms is one of the key drivers for the growth of e-commerce in Spain, thereby making it relevant to investigate all of them.

For our analysis, the variables used were: i) Internet characteristics - to distinguish heavy from average Internet users (the first being those that connect at least several times a week). We also distinguished between those users that connect from home (that own a PC and a connection); ii)

Game related issues - here we distinguished two issues, first intense users of games (those who spend more than 30 minutes per game session or less) and second, those users that are already offline purchasers of games for any of the three platforms analyzed; iii) Personal characteristics - we asked the user his/her age, gender and geographical localization. In terms of age, we separated between younger (34 or below) and older players. In terms of geographical location, we distinguished between Catalonia and Madrid and the rest of the country, as the first two areas show the largest ICT penetration.

**Table 1: Main statistics for the sample**

| Purchasing decision | | | | |
|---|---|---|---|---|
| Variable | Scale | Observations | Mean | Std. Dev. |
| Internet | 0:No - 1:Yes | 290 | 0.244828 | 0.430728 |
| Mobile | 0:No - 1:Yes | 290 | 0.313793 | 0.464836 |
| Console | 0:No - 1:Yes | 290 | 0.110345 | 0.313861 |
| Internet Characteristics | | | | |
| Variable | Scale | Observations | Mean | Std. Dev. |
| Heavy User (*user*) | 0:No - 1:Yes | 290 | 0.855172 | 0.352535 |
| Home User (*connection*) | 0:No - 1:Yes | 290 | 0.834483 | 0.372289 |
| Game Characteristics | | | | |
| Variable | Scale | Observations | Mean | Std. Dev. |
| Intense User (*intense*) | 0:No - 1:Yes | 290 | 0.710345 | 0.454386 |
| Offline Purchaser (*offline*) | 0:No - 1:Yes | 290 | 0.5 | 0.500864 |
| Personal Characteristics | | | | |
| Variable | Scale | Observations | Mean | Std. Dev. |
| Age 18-34 (*young*) | 0:No - 1:Yes | 290 | 0.482759 | 0.500566 |
| Female (*sex*) | 0:No - 1:Yes | 290 | 0.537931 | 0.499421 |
| Madrid-Catalonia (*geo*) | 0:No - 1:Yes | 290 | 0.403448 | 0.491437 |
| Source: Yahoo! Spain Survey, Spring 2004. | | | | |

## ANALYSIS AND DISCUSSION

In order to test our hypotheses, we used both logit and probit models, but as Greene (2000) suggests, the results in both cases show little difference. For the sake of simplicity, we will just show the logit results. The function we estimated is as follows:

$$\Pr\left(PURCHASE_i = 1/X\right) = INTERNET + GAMES + DEMO \quad \{1\}$$

That is, the probability of purchasing a game depends on the users' Internet and game usage and some demographic and geographical variables. The results of the estimations are shown in Tables 2, 3 and 4.

In the category "Internet behavior characteristics", we can see that if a user connects from home, it reduces the possibility of purchasing a game for any of the platforms. Its coefficient presents a negative and statistically relevant value. So it seems that people spending time at home on Internet are reluctant to pay for games. Also, contrary to our second hypothesis, being an intensive Internet user is not relevant when deciding whether to buy games for PCs or mobile devices, being only relevant for Console users. In this case, a negative relationship can be seen between an intensive Internet user and paying for console games, implying that substitution is taking place.

In "Game characteristics", and as expected by the third hypothesis, those users that already buy games off-line are more likely to do so on-line for any of the platforms. So, Internet becomes an additional channel to satisfy the preferences of the consumers.

**Table 2: Regression results for Internet users**

| | Coefficient | z-stat |
|---|---|---|
| *User* | -0.43 | -1.25 |
| *Connection* | -0.88* | -2.73 |
| *Intense* | 0.49 | -1.58 |
| *Offline* | 1.26* | 4.3 |
| *Young* | -30 | -1.09 |
| *Sex* | -0.38 | -1.37 |
| *Geo* | 0.041 | 0.16 |
| Log likelihood | -152.31 | |
| Pseudo R2 | 0.423 | |
| Nº Obs | 290 | |

* Significant at 99% level

Finally, when testing geographical issues, we rejected its relevance. We find that none of the demographic variables, except age in the case of mobile phones, are relevant for buying games. The exception is young people and mobile phones according to Jupiter Research (2004c), which

concludes that only younger users take advantage of mobile phones not only as communications devices but also as game platforms.

| Table 3: Regression results for mobile users | | |
|---|---|---|
| | Coefficient | z-stat |
| *User* | -0.73 | -2.2 |
| *Connection* | -1.14 | -3.61 |
| *Intense* | 0.11 | 0.39 |
| *Offline* | 1.12* | 4.06 |
| *Young* | 0.68* | 2.59 |
| *Sex* | -0.12 | -0.44 |
| *Geo* | -0.33 | -1.18 |
| Log likelihood | -161.41 | |
| Pseudo R2 | 0.44 | |
| Nº Obs | 290 | |
| *: Significant at 99% level | | |

| Table 4: Regression results for games console users | | |
|---|---|---|
| | Coefficient | z-stat |
| *User* | -1.27 | -3.15 |
| *Connection* | -1.56* | -4.04 |
| *Intense* | -0.18 | -0.45 |
| *Offline* | 1.20* | 3.06 |
| *Young* | -0.6 | -1.63 |
| *Sex* | 0.14 | -0.37 |
| *Geo* | 0.12 | 0.31 |
| Log likelihood | -95.85 | |
| Pseudo R2 | 0.32 | |
| Nº Obs | 290 | |
| *: Significant at 99% level | | |

Internet, as a General Purpose Technology that just has become widely available, is still developing in some sectors like games and content distribution. While Internet's early days were clearly associated with free content, to ensure the viability of the business model, it must now get

users to pay for that content, as they have traditionally done offline. Our results show that in purchasing decisions, personal characteristics are irrelevant and users are more focused on their prior behavior, as people who are already users and purchasers of games are more likely to acquire them online, those being the ones who spend more time playing and more likely to buy.

The basic conclusions that we can draw from the previous results are that those who are more intense content users, games in this case, are those who will be willing to purchase the product through the new channel, independently of other considerations, including personal characteristics or those related to their use of the Internet. The introduction of a new technology does not change the behavior of the users, but it does allow the current product users to have additional access to it.

## CONCLUSIONS

The importance of understanding that most of the new Internet-related industries are network-based economies is key to ensuring the success of the business models involved. The video game industry, which already has strong network effects, has started to use Internet payments and downloading as a way to increase the distribution of its products, not only for Internet users but also for the enjoyment on other development platforms, such as mobile devices or consoles. The success behind the introduction of a new product in these economies depends on understanding why the adoption of the product occurs.

To build the network, companies need to understand the possible adopter's profile in order to target their marketing resources to them. Using an Internet-based survey we have been able to investigate the characteristics of those users who are more willing to pay online for games on each of the various platforms. We find that heavy offline game users (those who already purchase video games in traditional stores) are those who are more willing to pay to download games on line. Surprisingly, geographical or personal characteristics are not relevant for the buying decision, nor is the intensity of their use of Internet. On the other hand, people willing to download games for their mobile terminal are heavy Internet users, a clearly differentiated result from those of the other two platforms.

This result has two implications: First, heavy Internet users are not willing to pay for content, games in this case, as they are used to getting that content for free. Second, there is a strong substitution between Internet use and console use: console owners substitute Internet surfing with game playing. Further research could focus on this substitution between game platforms, as new devices like Nokia N-Game or the new Sony PSP appear on the market, and on the evolution of consumer willingness to pay for Internet games/content. As new surveys are carried out in this area, it will be easy to add new data on the Internet consumer's behavior.

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