IMPACT OF INTERNET FINANCIAL REPORTING ON EMERGING MARKETS

Shirley A. Hunter, Tufts University
L. Murphy Smith, Texas A&M University

ABSTRACT

Application of information technology to gain a competitive advantage is well known and often used by business firms in developed countries. A fairly recent technological development is use of the Internet to provide corporate financial information, that is, Internet financial reporting. The research question posited by this study is: Do investors value emerging market firms that attempt to reduce information asymmetry by using information technology? This study uses the efficient market hypothesis to test the effects of two economic events on the market returns of emerging markets firms that engage in Internet financial reporting. At the macro-economic level, the event date is defined as the date the country deregulated the telecommunications industry granting commercial access to Internet providers. At the micro-economic level, the event date is based on the firm's announcement of the launching of its website. This study offers empirical evidence of the longitudinal effects of Internet technology i.e., timely dissemination of financial information, on emerging markets. The analysis reveals positive dispersions in market price and volume around the event dates. Market performance of securities listed on emerging market stock exchanges does improve after commercialization of the Internet.

INTRODUCTION

The use of information technology for competitive advantage is well known and often applied by business firms. Using stock data for firms listed on the emerging market stock exchanges in Brazil, India, Indonesia, Russia, and South Africa, this study provides empirical evidence as to the positive dispersions in price and volume regarding the economic event of investments in the Internet. We show that in spite of operating in highly volatile capital markets, some emerging market firms attempt to distinguish themselves in the 1990s by investing in Internet technology. Our study contributes to prior disclosure literature by providing evidence regarding the integrity and speed of adjustment (efficiency) of emerging markets to the new (value relevant) qualitative information that is released electronically by public firms.

Internet financial reporting refers to the use of a company's website to distribute information about the financial performance of the corporations. Use of Internet financial reporting is effectually

a method of marketing a company to shareholders and investors (Poon et al. 2003). According to Wagenhofer (2003), Internet financial reporting has at least two major economic effects. First, the Internet alters information processing costs and with it the demand and supply of financial information in capital markets. Second, Internet financial reporting creates a demand for standardization; this led to development of XBRL (Wagenhofer 2003).

Brown and Warner (1980) state that event studies provide a direct test of market efficiency; their assumptions are that the event will be either reflected in traded asset prices or in trading volume, if the corporate news announcement is deemed value-relevant to their investors. The authors that a major concern in event studies is that they tend to assess the extent to which security prices perform around the time of the economic event as abnormal. They also state that nonzero abnormal security returns that persist after a particular type of event are inconsistent with the efficient market hypothesis that security prices adjust quickly in order to fully reflect new information (Brown and Warner 1980).

In this study, we analyze two economic events to assess the impact of information technology in Brazil, India, Indonesia, Russia, and South Africa. The first event regards the effect of the Internet at the macro-economic level. The purpose of the first event analysis is to measure the total market response to the introduction of a new communications medium that resulted from reforms made to the telecommunications sector. The second event regards use of the Internet at the micro-economic level. The purpose of the second event analysis is to measure the market performance of those firms that have invested in the new technology. The firms with websites send a strong signal to the government of their endorsement of the privatization initiative.

This study uses valuation methodologies from prior literature to measure security price performances relative to the two event dates, i.e. the Mean Returns, the Market, and the Market Adjusted Returns models (Megginson 1997; Brown and Warner 1980). Each methodology was applied to publicly listed firms in Brazil, India, Indonesia, Russia, and South Africa that commercialized the Internet and announced the existence of their websites during the sampling period of 1991 to 2001. These five securities markets are, arguably, the most important and volatile emerging markets in the world and are often clustered into the same market indices by virtue of their systematic risks (Posner 1998; International Finance Corporation Annuals 1992-1999; Standard & Poor's Emerging Market Factbook (S&P EMF) 2000).

This study proceeds as follows. The next section briefly describes the research environment. Following this section, the research questions are formulated based on the conceptual model of the Internet as a reporting medium. Next, the theoretical development of the hypotheses is presented, followed by a section on the research methodology. Results are then described. The final section presents the conclusions and the limitations of the study, and suggests opportunities for future research.

RESEARCH ENVIRONMENT

The key objective of this event study is to determine whether any value enhancing benefits accrue for those emerging market firms that invest in Internet technology. Bhattacharya et al. (2000) state that event studies are used to measure the impact of an economic phenomenon on firm value. The economic event that motivates this study is the liberalization of the telecommunications sector in Brazil, India, Indonesia, Russia, and South Africa. In the 1990s, Brazil, India, Indonesia, Russia, and South Africa issued equity of $1 billion or more and BARRA rated these markets as highly volatile (Posner 1998). The research question posits whether investors attach any incremental value to consistent and accurate electronic disclosure by website firms in their attempt to alleviate some of the uncertainty attributed to investments in highly speculative markets. If the website is perceived as value enhancing by global investors, then the expectation is a positive response in abnormal returns.

Financial reporting issues, such as information integrity, associated with traditional paper reporting are equally relevant when companies use their website for reporting. Companies around the globe are making increased use of Internet financial reporting (Khlifi 2007, Pervan 2006, Oyelere et al. 2003, CTM 2003). Research has examined determinants of Internet financial reporting and how management might implement controls to ensure Internet financial reporting integrity (DiNapoli 2007, Khlifi 2007, Debreceny et al. 2002, PKF 2002).

Ismail et al. (2007) identify potential problems associated with Internet financial reporting. These problems are particularly troublesome if reporting objectives are not well designed, if the data is improperly formatted, if the system is flawed, and if the users are unable to use the data. They conclude that companies should carefully plan before implementing Internet financial reporting (Ismail et al. 2007). Bonson and Escobar (2006) examine how the European Union (EU) has developed a series of norms with the objective of increasing the transparency of both companies and the financial markets via distribution of company information on the Internet. Their study focuses on how incorporation of countries of Eastern Europe into the EU affects the transparency of the markets.

Once financial information is available on the Internet, it can be used in myriad ways, from traditional analyses to state-of-the-art. For example, Bovee et al. (2005) describe the development and applications of Financial Reporting and Auditing Agent with Net Knowledge (FRAANK). FRAANK is used to assimilate accounting numbers with other financial information publicly available on the Internet and calculates key financial ratios and other financial-analysis indicators. Coupland (2006) offers an analysis of Internet-based financial and corporate social responsibility (CSR) reports, and raises questions regarding prominence given CSR issues due to physical positioning or language used.

EMERGING MARKETS

The term "emerging market" implies a stock market that is in transition, increasing in size, activity, or level of sophistication (International Finance Corporation Annuals (IFC) 1992-1999; Standard & Poor's Emerging Market Factbook (S&P EMF) 1999-2000). A stock market is classified as emerging if it is located in a low or middle-income economy, as defined by the World Bank, and its *"investable"* market capitalization is low relative to its most recent Gross National Product per capita (S&P EMF 2000). In the Standard & Poor's Emerging Market Database, the first test of a stock's "investability" is determining whether the market is open to foreign institutions. Standard & Poor's determine the extent to which foreigners can buy and sell shares on local exchanges and repatriate capital, capital gains, and dividend income without undue constraint. Standard & Poor's also examines company statutes that could for impose limits on foreign ownership that may be more restrictive than national law.

Table 1 shows that the sample countries have created an enabling environment for investments in the Internet. Column 3 in Table 1 shows that South Africa was ranked 17th in terms of total market capitalization in 1997, demonstrating a drastic decline in total market capitalization from its 1st place ranking in 1990. Brazil experienced a similar decline in market rank in total market capitalization to 18th in 1997 from its prior 3rd place rank in 1990. The volatility in market capitalization was attributed to some extent to such macroeconomic factors as inflation and currency devaluation that were impeding the operating performance of some of the listed firms. For India, Indonesia, and Russia, Column 4 reports Gross National Product per capita as systematically below that of Brazil and South Africa during most of the 1990s.

The conclusions reached in this study concerning Brazil, India, Indonesia, Russia, and South Africa could be generalized to other emerging markets in Africa, Asia, Eastern Europe, and Latin America with similar characteristics such as low liquidity and restrictions on foreign investors.

THE INTERNET IN EMERGING MARKETS

This event study looks for a positive market response to the introduction of the new electronic stimulus. The assumption is that any firm disseminating its information electronically to its investors has already altered its assets structure by making substantial investments in information technology (IT). The Internet represents a tangible benefit from those IT investments, with electronic reporting made available as the main communication process.

The Internet is not the sole catalyst that will propel these five countries in this study into the global market. In this study, it is the communications medium that is leading to a reduction in information asymmetry in securities markets, which are characterized by low liquidity. Each of the markets in this study is already in some stage of Internet development, but none have achieved the level of Internet penetration experienced in the United States.

TABLE I
Investment Restrictions and Investor Information by Country Chronological Time Series 1990-2000

TIME PERIOD	COUNTRY	MARKET RANKING	GNP PER CAPITA $	MARKET BARRIERS TO ENTRY AND EXIT			WITHHOLDING TAX			QUALITY OF INFORMATION	
				RESTRICTIONS ON FOREIGN INVESTORS	REPATRIATION OF INCOME	REPATRIATION OF CAPITAL	INTEREST	DIVIDENDS	LONG TERM CAPITAL GAINS	INVESTOR (h) PROTECTION	ACCOUNTING STANDARDS
1990-1991	Brazil	3	2,810	None	None	None	15%	15%	15%	Good	Adequate
	India	10	310	Authorized Investors	Some	Some	10%	10%	10%	Good	Good
	Indonesia	11	680	Some	Some	Some	20%	20%	20%	Adequate	Poor
	Russia	n.a.	2,820	Closed	Closed	Closed	32%	32%	n.a.	Poor	Poor
	South Africa	1	2,830	None	None	None	0%	15%	0%	Good	Good
1992-1994	Brazil	15	3,020	None	None	None	15%	15%	0%	Good/69.9	Adequate
	India	22	290	Authorized Investors	None	None	20%	20%	20%	Adequate/28.0	Adequate
	Indonesia	27	730	Some	Some	Some	15%	15%	15%	Adequate/63.4	Poor
	Russia	35	2,350	Closed	Closed	Closed	32%	32%	32%	Poor/n.a.	Poor
	South Africa	11	2,900	None	None	None	0%	15%	0%	Adequate/n.a.	Good
1995-1996	Brazil	17	3,640	None	None	None	15%	0%	0%	68.5	Adequate
	India	20	340	Authorized Investors	None	None	20%	20%	10%	16.8	Adequate
	Indonesia	25	980	Some	Some	Some	20%	20%	1%	56.3	Poor
	Russia	33	2,240	None	None	None	15%	15%	20%	n.a.	Poor
	South Africa	16	3,160	None	None	None	0%	0%	0%	22.4	Good
1997-1998	Brazil	18	4,790	None	None	None	15%	15%	0%	69.7	Adequate
	India	21	370	Authorized Investors	None	None	20%	20%	10%	47.3	Adequate
	Indonesia	38	1,110	Some	Some	Some	20%	20%	0%	63.5	Poor
	Russia	36	2,680	None	None	None	0%	10%	n.a.	n.a.	Poor
	South Africa	17	3,210	None	None	None	0%	0%	0%	47.4	Good
1999-2000	Brazil	19	4,630	None	None	None	15%	0%	0%	64.0	Adequate
	India	23	440	Authorized Investors	None	None	20%	20%	10%	43.6	Adequate
	Indonesia	33	640	Some	Some	Some	20%	20%	0%	58.6	Poor
	Russia	29	2,260	None	None	None	0%	10%	n.a.	n.a.	Poor
	South Africa	18	3,310	None	None	None	0%	0%	0%	25.5	Good

Notes:
a. None = Foreign investors have free entry and exit privileges to purchase stocks.
b. Some = Foreigners are required to register with the Central Bank to ensure repatriation rights.
c. Foreigners approved by the Central Bank may buy stocks.
d. Closed = Closed to foreign investors. e. Good = International acceptable quality. f. Adequate = Local market quality.
g. Poor = Require reform. h. Operational Risk Benchmark = IFC quantified the data -100 points scale.

If the emerging stock markets are truly efficient as defined by Fama (1970), then firms that voluntarily develop websites send a costly signal to investors that future reporting will be timelier than in the past and, if that signal is deemed credible, the market should respond. The prediction is that both local and global stock markets will reward those emerging market stock companies that engage in electronic reporting over their non-website competitors, because website firms are attempting to reduce information asymmetry between investors and themselves with the expectation of monetary rewards.

THEORETICAL DEVELOPMENT OF THE HYPOTHESES

Prior disclosure literature shows that the quality of supplemental voluntary printed disclosures is associated with a lower cost of capital for manufacturing firms in the United States (Botosan 1997). Table 2 reports the results from prior studies, on the impact of the Internet as a reporting medium various countries which suggest that investors prefer timely and accurate financial information that is electronically disseminated, over printed material for decision making (Ashbaugh et al. 1999; Deller et al. 1999; Financial Accounting Standards Board [FASB] 2000; Marston and Leow 1998; and Westarp et al. 1998).

Table 2: Internet Financial Reporting Studies				
STUDY	PUBLICATION DATE	RESEARCH FOCUS	GEOGRAPHICAL REGION	RESEARCH FINDINGS
Financial Accounting Standards Board (FASB)	2000	Financial disclosure on the Internet	United States	Financial reporting on web by U.S. firms around 1997. Legal hazards of excerpted financial data, hyperlinks, and transcriptions.
International Accounting Standards Board (IASB) (Lymer, Debrecency, Gray, and Rahman)	1999	Annual financial on the Internet	Australia, Brazil, Canada, France, Japan, Norway, South Africa, United Kingdom, and United States,	22 countries, U.S. and U.K. dominate 660 sample firms, 86% of firms have websites, and information content of website.
Ashbaugh, Johnstone, and Warfield	1999	Financial information contained on website	United States	Investors valued timely disseminated accurate information by website firms

Table 2: Internet Financial Reporting Studies				
STUDY	PUBLICATION DATE	RESEARCH FOCUS	GEOGRAPHICAL REGION	RESEARCH FINDINGS
Deller, Stubenrath, and Weber	1999	World wide web, shareholder structure, and network effects	United States, United Kingdom, and Germany	Financial disclosure is more prevalent in the United States where the Internet is pervasive and private investors dominate the stock market
Marston and Leow	1998	Firm characteristics and electronic disclosure	United Kingdom	Firm size and financial services sector had significant impact on quality of electronic disclosure
Westarp, Ordelheid, Stubenrath, Buxman, and Konig	1998	Internet disclosure and GAAP	United States, United Kingdom, and Germany	Selective electronic disclosure

A study by Lymer et al. (1999) of 660 companies from 22 countries shows that 62% of the firms had websites that disclosed financial information. Driven by the market demand for more business information, Lymer et al.'s (1999) descriptive statistics show that more than 70% of the listed firms in Canada, Germany, Sweden, the U.K. and the U.S. use the Web and 52% of the firms in Chile have websites. Lymer et al.'s (1999) study provides evidence that publicly traded firms are using the Internet to disclose relevant information about their operations to foreign investors and creditors. However, prior literature has not examined the impact of electronic reporting on firm value. We predict that emerging market firms with websites will continue to incur the incremental costs of voluntary electronic disclosure as long as they are signaling value-relevant information to investors and creditors.

The current study posits that the market response to a company announcing that it is establishing a website could be empirically measured ex-post by examining daily abnormal returns using a short-event window. This study suggests that if the magnitude of the residuals from abnormal returns surrounding the event window exceeds that which occurs during the non-event estimation period, then the market has assigned some incremental value to that information. This incremental value serves as the incentive that motivates managers to establish a website. Our prediction is that the incremental value of this signal should be more apparent in emerging market firms with ownership structures that exhibit greater information asymmetry than comparable firms in developed markets.

The efficient market hypothesis (EMH) is one of the theoretical axioms supporting prior disclosure literature that forms the basis for this study (Fama et al.1969; Fama 1970). The EMH posits that stock markets react to new (value relevant) information that is disclosed by public companies through variations in either the stock price, or in trading volume. Prior literature has analyzed abnormal performance indices for publicly traded firms in developed countries, providing evidence of a spike in abnormal returns during the event window of announced earnings (Ball and Brown 1968). The EMH leads to the premise for Hypothesis One, which examines the overall market response to the release of new information by the government that it has allowed the telecommunications sector to permit commercialization of the Internet:

> *H1:* *The market performance of securities listed on emerging market stock exchanges is higher in the post-event period following commercialization of the Internet.*

This study also questions if any value-enhancing benefits accrue for the emerging market stock companies that voluntary engage in electronic disclosure. For example, does the Internet matter for those firms with concentrated ownership structures that are also listed on emerging market exchanges? In addition, do market incentives exist which motivate manages of these firms to take action to reduce information asymmetry between their firms and external stakeholders? If so, is the Internet the reporting medium being used to communicate the manager's response (acceptance) of the market incentive? Alternatively, are these managers merely mimicking the behavior of listed firms on stock exchanges in developed nations? Prior literature shows that the benefits of voluntary management forecast disclosure increase when private information exists (Baginski et al. 2002).

Our prediction is a positive reaction to corporate news of a website, a non-financial market event, because global investors and creditors value manager's efforts to reduce information asymmetry in the market. This suggests that we are specifically testing for a non-zero or positive abnormal returns during the event period, implying that the market participants value the information. Brown and Warner (1980) state that positive abnormal returns signal a good news response to the economic event as opposed to negative abnormal performance or bad news. If the economic event results in an unconditional abnormal performance equal to zero, then the null hypothesis of no abnormal sample security returns is realized (Brown and Warner 1980). For the study, the prediction of a good news response to the micro-economic event leads to Hypothesis Two:

> *H2:* *The market responds positively to emerging market firms that announce the launching of a website.*

RESEARCH METHODOLOGY

Research methodology includes two sections. The first reports on the analysis of the country level event, using monthly mean differences. The second reports on the analysis of the firm level event, using daily abnormal returns.

MONTHLY MEAN DIFFERENCES TEST – COUNTRY LEVEL EVENT

To test the first hypothesis, the Wilcoxon Signed Rank test, a non-parametric test rank order statistical test measuring the volatility of means returns, was calculated and is presented in a format following a methodology proposed by Bhattacharya et al. (2000) and Corrado (1989). A two-tailed test at the 5% percent level was used to rank the order of the absolute value of equal and value weighted returns for each firm (i) (Bhattacharya et al. 2000 and Corrado 1989). Table 3 presents the monthly event periods (-36, + 36 months, -24, + 24 months, and -12, +12 months) for phase 1 of the study. The mean differences in returns are examined relative to the null hypothesis for each firm (i) in specific country (c).

Table 3: Longitudinal Event Time Line (1991 - 2001)					
ANALYSIS	DATA LEVEL	ECONOMIC EVENT& PREDICTION	RETURNS ESTIMATION INTERVAL	EVENT WINDOWS	EVENT PERIOD
Phase 1	Country	Commercialization	Monthly	(-36,+36 months)	1991-1997
	specific	of the Internet	Returns	(-24, +24 months)	
		Hypothesis One		(-12, +12 months)	
		Positive differences			
Phase 2	Firm	Launch of Website	Daily	(-10, +10 days)	1998-2001
	specific	and Investor Relations	Abnormal	(-15, +15 days)	
		Hypothesis Two	Returns		
		Positive differences			

To reject the null hypothesis, the differences in mean returns during the pre-and post-event windows should not equal zero. The one-tailed test at the 2.5% percent level examines Hypothesis One, indicating that the magnitude of the parameter should be significantly higher in the post-event periods. For this study, the Wilcoxon Signed-Rank test is used because it is more analogous to the parametric Correlated or Related sample t-test; it takes into account the magnitude as well as the direction of the difference for each pair.

The z test statistics are as follows, for each firm (i) in country (c) for event period (t):

$$z = \frac{T - \mu_T}{\sigma_T}$$ Formula (1)

where

$$\mu_T = \frac{n_1(n_1 + n_2 + 1)}{2}$$

and the standard deviation (σ_T) is calculated below for the entire event period

$$\sigma_T{}^2 = \frac{n_1 n_2 (n_1 + n_2 + 1)}{12}$$

The rejection regions for specified levels of α are:

Reject H_0 if $z \neq z_{\alpha/2}$, for $\alpha = 0.050$
Reject H_1 if $z < z_\alpha$, for $\alpha/2 = 0.025$

DAILY ABNORMAL RETURNS – FIRM LEVEL EVENT

In the second phase of the study, two event windows (-10, +10 days and - 15, + 15 days) are used to examine the impact of the Internet on daily returns for those firms listed on the emerging market stock returns in Brazil, India, Indonesia, Russia, and South Africa. A 260-day (-60 to +200) estimation period leading up to these event windows is defined around the corporate news announcements of the Internet launch dates for each firm. The use of a benchmark pre-Internet window allows us to establish a baseline of normal market behavior for these firms following a methodology proposed in other event studies (Brown and Warner 1985). It also allows for the use of these sample firms as their own control group, since it has proven difficult for us to obtain data on a matched group of emerging market non-web firms. The post-Internet period is defined as the event window after the corporate news announcement of the launch date for the website.

We propose Abnormal Returns (ϵ_{ict}) as the performance measure of the market valuation models, as opposed to Botosan's (1997) cost of capital, as the variable of interest because stock returns (R_{ict}) for firm (i) in country (c) at time (t) serve as an independent measure of the market's response to the event. Prior literature shows that when an event occurs whose impact may be highly significant to the welfare of the firms, there should be an economic reaction by the market (Fama 1970). The performance measures show that any deviations from the expected return are interpreted

as Abnormal Returns (ϵ_{ict}). The expectation is that Abnormal Returns should equal zero ($E(\epsilon_{ict}) = 0$) and provide evidence of an efficient market (Brown and Warner 1980).

The Market Model ($R_{ict} = a_{ict} + B_{ict}R_{mct} + \epsilon_{ict}$) and the Market Adjusted Returns Model ($R_{ict} = R_{fct} + [R_{mct} - R_{fct}]B_{ict} + \epsilon_{ict}$) are used to calculate the Cumulative Abnormal Average Residuals effect ($CAR_{ict} = CAR_{ict-1} + AAR_{ict}$) on the stock returns for those emerging market firms in the pre-Internet and post-Internet periods following the methodology proposed by Brown and Warner (1980).

Brown and Warner (1980) suggest that one could also use the Cumulative Abnormal Average Residual method to investigate abnormal performance when there is incomplete information about the event date. This method is appropriate for this study since the event date is defined as a random variable. The method calculates the Cumulative Abnormal Average Residuals in the pre-event window (CAR_{ict-1}) plus the current value of the Average Residuals (AAR_{ict}) in order to determine if they are systematically different from zero.

The decision by firm management to establish a website signal that the firm is trying to distinguish itself from non-website firms is examined in Hypothesis Two. Under the signaling hypothesis, this event should have informational value and affect security prices (Beaver 1998). To the extent that the firm's investment in information technology results in the electronic disclosure of financial statements, the economic consequences of the investment action should positively alter stock prices, as reflected in the residual error terms of the post-Internet period. Formulae for this analysis are shown below:

$$R_{ict} = a_{ict} + B_{ict}R_{mct} + \epsilon_{ict} \qquad \text{Formula (2)}$$
$$R_{ict} = R_{fct} + [R_{mct} - R_{fct}]B_{ict} + \epsilon_{ict} \qquad \text{Formula (3)}$$
$$\epsilon_{ict} = \quad - E(R_{ict}|\underline{\quad}) \qquad \text{Formula (4)}$$
$$E(\epsilon_{ict}) = \quad 0 \qquad \text{Formula (5)}$$
$$CAR_{ict} = CAR_{ict-1} + AAR_{ict} \qquad \text{Formula (6)}$$
$$E(CAR_{ict}) = \quad 0 \qquad \text{Formula (7)}$$

The rejection regions for specified levels of α are:

Reject H_0 if $z \neq z_{\alpha/2}$, for BOL97\f"Symbol"\s12 = 0.050
Reject H_2 if $z < z_{\alpha}$, for $\alpha/2 = 0.025$

SAMPLE DATA

The country level data on the telecommunications industry, Internet, and stock market statistics for Brazil, India, Indonesia, Russia, and South Africa were obtained from the International Telecommunications Union Annuals (ITU 1994-2002) and the Emerging Stock Markets Factbook

(IFC 1992-1999). The first phase of the study examines the effects of commercialization of the Internet in emerging markets. The sampling period for this analysis was from 1991 to 1997. This phase of the study provides empirical evidence that an enabling information technology infrastructure exists in Brazil, India, Indonesia, Russia, and South Africa, which is necessary to support investments in web technology at the firm level. The event date (MMYY) is the Internet access day for each country (ITU Annuals 1994-2002). Monthly returns are used to measure the market performance in the pre-Internet and post-Internet periods. The event estimation windows for this analysis are (-36, +36 months), (-24, + 24 months), and (-12, +12 months).

Table 4 reports some descriptive statistics on the stock exchanges in Brazil, India, Indonesia, Russia, and South Africa using mean market data for the pre-Internet and post-Internet periods. The data represents the total number of firms listed in each country during the pre- and post- event periods. The results are reported in U.S. dollars reflecting ESMF foreign currency, devaluation, and inflationary adjustments.

Table 4: Market Performance Statistics of Listed Firms
Mean Monthly Market Data (U.S. $)
Sampling Period 1991 to 1997

PANEL A – Pre-Internet Period

COUNTRY	Total Firms	Market Capital.	t -36 Value Traded	Days Traded	S.D.	Turn-	S.D.	Total Firms	Market Capitalization	t -24 Value Traded	Days	S.D..	Turn	S.D.	Total Firms	Market Capitalli	t -12 Value Traded	Days	S.D.	Turn	S.D.
Brazil	573	31,753.2	768.5	20.0	1.00	2.8	1.14	569	55,072.7	1,891.5	20.6	0.92	3.7	0.56	556	74,959.8	3,317.4	20.5	1.25	5.0	1.12
India	2,590	66,169.3	2,129.0	15.8	3.44	3.7	2.06	2,828	66,533.7	1,313.3	18.3	2.22	2.0	0.58	3,475	104,331.7	2,424.4	18.4	3.20	2.6	1.04
Indonesia	139	7,955.1	260.4	20.7	1.97	3.3	0.79	153	12,423.4	394.9	20.4	1.16	3.2	1.34	170	25,802.4	957.4	20.4	1.38	3.8	0.81
Russia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
South Africa	-	-	-	-	-	-	-	683	103,536.6	341.1	21.0		0.0		664	134,885.6	822.6	21.2	1.34	0.6	0.12

PANEL B: Post-Internet Period

			t +12							t +24							t +36				
Brazil	542	151,194.0	8,396.7	20.5	1.25	5.8	1.30	543	152,329.2	6,487.8	20.4	1.35	4.3	0.51	548	191,720.8	9,757.8	20.8	1.29	5.2	0.80
India	4,671	135,616.0	1,760.9	19.2	1.95	1.3	0.47	5,549	144,955.9	6,477.1	19.9	1.93	4.4	2.70	5,898	138,162.8	11,163.8	19.8	1.75	8.0	2.13
Indonesia	209	44,058.1	943.1	20.6	1.24	2.2	0.51	234	65,331.0	1,767.6	20.6	1.93	2.7	0.46	252	87,847.7	3,314.5	20.6	1.78	3.8	0.64
Russia	-	-	-	-	-	-	-	100	15,632.5	143.9	20.0	1.87	0.8	0.64	97	53,867.7	560.7	20.8	1.30	1.1	0.35
South Africa	637	189,828.3	1,261.7	20.8	1.96	0.7	0.16	642	249,180.9	1,557.4	20.8	1.54	0.6	0.11	633	256,168.5	2,250.0	20.9	1.38	0.9	0.11

Notes:
a. Data source - Emerging Stock Markets Factbook and Standard & Poor Emerging Markets Database.
b. Country Internet Access Dates - Brazil Jan 94, India Aug 94, Indonesia May 94, Russia Jun 94, and South Africa Jan 94.
c. Russia - Information available Jun 96, t+24 represents 5 months data, t+36 represents 12 months data.
d. South Africa - Information available Dec 92, t+24 represents 1 month data, thereafter 12 months data.
* + Market Capital. = Market Capitalization; Turn = turnover ratio; **SD = standard Deviation; ***Days = days traded;

Over the entire pre-and post-event periods, the mean level of market liquidity appears to have been more stable in Brazil, at an average turnover ratio of 4.5x, relative to India, Indonesia, Russia, and South Africa. Although a late comer to the investment indices, the mean market capitalization has been consistently higher in South Africa in comparison to the other countries, from a low of $103.5 million in the pre-Internet period (*t-24*) for the 683 listings, to more than doubling in the post-Internet period (*t+24*) to $249.2 million for a mean number of 642 listed stocks. The stock exchanges in India report the largest increase in new, small firm listings based on a mean market capitalization of $138.2 million for 5,898 firms in the post-Internet period (t+36), from an initial level of $66.2 million for 2,590 listings in the pre-Internet period (t-36). Although Russia's stock exchange is rather embryonic, the turnover ratio at 1.1x in the post-Internet period (*t+36*) outperformed South Africa's market.

Firm level data were obtained from the Emerging Stock Markets Factbook (IFC 1992-1999), the Global Researcher Worldscope (Global 2006), and Standard and Poor's Emerging Markets (Standard and Pooor's 2000) databases. The second phase of the event study measures the impact of the web on the market performance of listed firms. Eventus Software was used for the second phase of this study. The sampling period was from 1998 to 2001. The event date (DDMMYY) was obtained using an electronic survey and the Global database. This date represents the date that knowledge of the firm 's website was either announced by the firm or disclosed by a third party intermediary (Global). The event windows for testing Hypothesis Two are (-10, +10 days) and (-15, +15 days).

RESULTS

Results include two parts. The first concerns commercialization of the Internet in emerging markets. The second involves impact of corporate websites on emerging markets.

COMMERCIALIZATION OF THE INTERNET IN EMERGING MARKETS

Panel A of Table 5 reports the results from using equally weighted stock returns to test mean differences in the event periods. There are 11,992 firm-month observations in the portfolio. The z-statistics are significantly positive for India, Indonesia, and South Africa in the event window (*t+12*) – (*t-12*), leading to a rejection of the null hypothesis of equal means. Thus, Hypothesis 1 is accepted that the market performance of securities listed on emerging market stock exchanges is higher in the post-event period following commercialization of the Internet, with regard to India, Indonesia, and South Africa. For example, regarding India, the z-statistics are significantly positive in the pre-Internet period *(t-12) - (t-24)* which persists for 2 years through to the post-Internet period *(t+24) - (t+12)*, most likely due to the significant increase in the number of firms trading in India during

these periods. An analysis of value weighted mean returns yielded the same results as the analysis of equal weighted mean returns.

Table 5: Test of Mean Differences in Price and Volume Mean Monthly Returns and Trading Volume (U.s. $)													
Panel a - Equal Weighted Mean Returns													
COUNTRY	Internet Access Date	Total Firms	PRE - INTERNET PERIOD			POST - INTERNET PERIOD			MEAN DIFFERENCES IN EVENT PERIODS					
									z- statistics					
			t -36	t -24	t -12	t +12	t +24	t +36	(t-24) - (t-36)	(t-12) - (t-24)	(t+12) - (t-12)	(t+24) - (t+12)	(t+36) - (t+24)
Brazil	Jan-94	55	2.571	1.057	2.437	2.732	2.319	1.365	2.307**	0.644	0.366	6.357**	4.688**
India	Aug-94	45	1.044	0.990	1.051	0.964	0.983	0.993	3.753**	7.930**	11.367**	2.426**	0.116
Indonesia	May-94	23	0.970	0.999	1.025	0.975	1.001	0.998	2.565**	1.208	3.688**	2.689**	0.258
Russia	Jun-94	25	-	-	-	-	-	1.072	-	-	-	-	-
South Africa	Jan-94	59	-	-	1.061	1.013	1.034	0.971	-	-	4.924**	1.808	12.140**
Panel B - Mean Trading Volume													
Brazil	Jan-94	55	733.925	795.238	1,505.471	1,367.904	1,699.092	1,891.581	5.453**	8.552**	4.403**	0.623	2.463**
India	Aug-94	45	1.280	1.009	1.634	0.753	2.745	8.819	5.727**	7.330**	14.763**	6.882**	11.736**
Indonesia	May-94	23	2.392	3.958	6.528	7.014	11.453	18.289	3.665**	6.666**	0.777	6.118**	4.017**
Russia	Jun-94	25	-	-	-	-	-	38.250	-	-	-	-	-
South Africa	Jan-94	59	-	-	1.451	2.432	2.236	3.395	-	-	8.010**	3.922**	13.533**
Note: z- statistics based on the Wilcoxon Signed Rank Test at two-tailed significance levels 0.05** or less for the mean differences in event periods.													

The mean differences in trading volume are reported in Panel B of Table 5. The volume differences are significantly positive at the 0.05 level on the event date *(t+12) - (t-12)* for Brazil, India, and South Africa, leading to a rejection of the null hypothesis. Thus, the analysis of mean trading volume corroborates the analysis of mean returns.

THE IMPACT OF CORPORATE WEBSITES ON EMERGING MARKETS

Table 6 reports the results from using the Market Model to calculate Daily Abnormal Returns in the event period. The same results were obtained, but not shown in the table, from the Market Adjusted Returns Model. The t-statistics are significantly positive at the 0.05 level, rejecting the null hypothesis that the residual error term is equal to zero. Thus, Hypothesis 2 is accepted that the market responds positively to emerging market firms that announce the launching of a website. As expected, positive abnormal returns are realized at the 0.025 significance level (for $\alpha = 0.05/2$), signaling a good news market response to the corporate news announcement of the launch of a website.

Table 6: Market Model Daily Abnormal Returns Composite Firm Level Data					
Panel A: n = 151					
DATE	AVERAGE ABNORMAL RETURN	MEDIAN ABNORMAL RETURN	*t-statistics*	POSITIVE: NEGATIVE	SIGN TEST *z-statistics*
Window -15					
-14	*-0.05*	*0.00*	*-0.09*	*76:75*	*0.65*
-13	*0.04*	*0.01*	*0.07*	*77:74*	*0.82*
-12	*-0.37*	*-0.10*	*-0.71*	*71:80*	*-0.16*
-11	*0.48*	*0.03*	*0.91*	*77:74*	*0.82*
Window -10	*0.21*	*-0.20*	*0.40*	*68:83*	*-0.65*
-9	*0.06*	*-0.15*	*0.11*	*67:84*	*-0.81*
-8	*0.16*	*-0.01*	*0.31*	*75:76*	*0.49*
-7	*-0.01*	*0.01*	*-0.03*	*79:72*	*1.14*
-6	*-0.49*	*-0.50*	*-0.93*	*57:94*	*-2.44****
-5	*-0.09*	*-0.26*	*-0.17*	*62:89*	*-1.63**
-4	*0.46*	*0.14*	*0.88*	*78:73*	*0.98*
-3	*0.05*	*-0.04*	*0.10*	*72:79*	*0.00*
-2	*0.61*	*0.15*	*1.16*	*81:70*	*1.47**
-1	*0.68*	*0.15*	*1.28**	*82:69*	*1.63**
Event Day 0	*1.02*	*-0.17*	*1.94***	*69:82*	*-0.49*
+1	*-0.03*	*-0.26*	*-0.06*	*65:86*	*-1.14*
+2	*-0.64*	*-0.29*	*-1.22*	*68:83*	*-0.65*
+3	*0.35*	*0.30*	*0.66*	*86:65*	*2.28***
+4	*-0.32*	*-0.18*	*-0.61*	*73:78*	*0.17*
+5	*0.21*	*-0.13*	*0.40*	*74:77*	*0.33*
+6	*0.69*	*0.27*	*1.32**	*82:69*	*1.63**
+7	*-0.29*	*-0.16*	*-0.55*	*70:81*	*-0.32*
+8	*0.12*	*0.02*	*0.23*	*80:71*	*1.31**
+9	*0.27*	*-0.06*	*0.52*	*70:81*	*-0.32*

Table 6: Market Model Daily Abnormal Returns Composite Firm Level Data					
Window +10	-0.05	-0.07	-0.10	70:81	-0.32
+11	0.66	0.15	1.25	82:69	1.63*
+12	1.42	-0.04	2.70***	73:78	0.17
+13	0.91	0.06	1.73**	79:72	1.14
+14	1.22	-0.10	2.31**	72:79	0.00
Window +15	0.86	0.11	1.63*	84:67	1.96**
Panel B: n = 151					
EVENT WINDOWS	*CUMULATIVE* AVERAGE ABNORMAL RETURNS	*MEDIAN* CUMULATIVE ABNORMAL RETURNS	*t-statistics*	*POSITIVE:* NEGATIVE	SIGN TEST *z-statistics*
(-10,+10)	2.98	2.88	1.23	89:62	2.77***
(-15,+15)	8.58	4.00	2.92***	87:64	2.45***
Notes: *a. Significance levels 0.01***, 0.05**, and 0.10*; b. Abnormal Returns used value-weighted index;* *c. Sign test based on one-tailed test.*					

In Table 7, the Market Model method is used to report the t-statistics on the sample data that has been disaggregated by country. The t-statistics are significantly positive for Indonesia and South Africa in each of the event windows (-10, +10 days) and (-15, +15 days), a strong indication of a good news market response to the economic event. This suggests that for listed firms in Indonesia and South Africa, a significant market response resulted from the Web announcement. The t-value for India in the event window (-15, +15 days) is positive and significant supporting a lag in the market response to the news event.

Hypothesis 2 that predicts positive returns in the post-event window is rejected for Brazil and Russia in both event periods due to their significantly negative results. The magnitude of the t-values show a general trend of declining levels of significant negative abnormal returns being realized in each subsequent event window for Brazil and Russia. However, since the cut-off date for this study is set at 31 days, further analysis beyond that period could conflict with other confounding market events.

In Brazil and Russia, the residual error terms were significantly negative throughout the event periods, thus causing a rejection of the second null hypothesis. One of the factors contributing to this negative reaction may be that many of the websites in Brazil and Russia only display information in Portuguese and Russian, respectively. The language obstacles create some difficulties when trying to manipulate these websites.

www.manaraa.com

Table 7: Market Model Daily Abnormal Returns					
COUNTRY	n	EVENT WINDOW	t-value	t statistics	MEAN DIFFERENCES
Brazil	44	(-10,10)	-7.776	0.000***	-0.0013
	44	(-15,15)	-1.790	0.074*	-0.0003
India	42	(-10,10)	-3.579	0.000***	-0.0003
	42	(-15,15)	13.967	0.000***	0.0015
Indonesia	22	(-10,10)	16.467	0.000***	0.0033
	22	(-15,15)	69.060	0.000***	0.2496
Russia	8	(-10,10)	-15.926	0.000***	-0.0076
	8	(-15,15)	-2.404	0.016**	-0.0006
South Africa	35	(-10,10)	17.951	0.000***	0.0015
	35	(-15,15)	12.123	0.000***	0.0013

Notes:
     a. One - sample t-test of null hypothesis, test value = 0.
     b. Significance levels 0.01***, 0.05**, and 0.10* based on two-tailed test.					

In a low liquidity market characterized by high information asymmetry, prior literature predicts a lag in the market response to new information (Bhattacharya et al. 2000). This was true for India, which registered significantly positive abnormal returns in the event window (-15, +15 days). Bhattacharya et al. (2000) also state that an economy may be information inefficient, and that prices may be left with no announcement stimuli against which to respond. The corporate news announcement of an emerging market firm launching a website, a technology induced stimulus, could possibly fit this analogy. In countries where individuals are economically marginalized, use of the Internet as a communications medium may be value-relevant to a subgroup of investors who are attempting to diversify their portfolios.

SUMMARY AND CONCLUSIONS

This study contributes to prior literature on the Internet by providing empirical evidence of the longitudinal effects of the Internet technology on emerging markets. It demonstrates that in markets that suffer from low liquidity, firms that invest in Internet technology are able to use the electronic medium to attract foreign investors, analysts, and creditors who might not have otherwise consider the emerging market securities within their portfolios. As predicted for the first hypothesis, the market performance of securities listed on emerging market stock exchanges is higher in the

post-event period following commercialization of the Internet, with regard to India, Indonesia, and South Africa.

Some disparities were observed in the hypothesized effects accruing from a firm launching a website in second phase of the study. As predicted by the second hypothesis, managers of website firms will incur the costs of electronically disclosing private information to potential investors as long as their wealth is increased. The incremental price effect is the pecuniary payoff sought by these managers. The value of the website firms in India, Indonesia, and South Africa appears to be incrementally enhanced due to their investments in Web technology. The magnitude of the price effects was more significant for website firms in Indonesia and South Africa than for those in India. These price dispersions could be driven by such country specific factors as the existence of an extractive iron ore-mining sector in South Africa that attracts more foreign investors' interest than the agricultural sectors in India.

In many ways, this study could serve as a benchmark for future studies on Internet financial reporting that might replicate these phenomena in other emerging markets. The findings from this study could assist analysts seeking new markets for investments in order to balance some of their portfolio's risk. It is also of interest to policymakers because the Internet and website firms show support at the micro-level for a national policy on privatization.

Some caveats to these markets should be considered when reaching these conclusions. They are characterized by low liquidity and business practices suggest that the protection of foreign investors may be minimal. This study shows that there is a lag in the speed of adjustment of these emerging markets to new information. This lag in response cannot be interpreted that these markets are less efficient than developed markets because these markets are bombarded by different macroeconomic factors than those that exist in for example, either the United States or United Kingdom. If these markets are truly inefficient in the theoretical context of the Efficient Market Hypothesis, then well-informed investors could institute a profitable trading strategy. However, this may not be practicable due to limited foreign investments in emerging markets' firms.

REFERENCES

Ashbaugh, H., K. Johnstone, and T. Warfield (1999). Corporate reporting on the Internet. *Accounting Horizons* 13 (3): 241-257.

Baginski, S.P., J.M. Hassell, and M.D. Kimbrough (2002). The effect of legal environment on voluntary disclosure: Evidence from management earnings forecasts issued in the U.S. and Canadian markets. *The Accounting Review* 77 (January): 25-50.

Ball, R. and P. Brown (1968). An Empirical Evaluation of Accounting Income Numbers, *Journal of Accounting Research* (Autumn).

Beaver, W.H. ed. (1998). *Financial Reporting: An Accounting Revolution*. Englewood Cliffs, NJ. Prentice Hall.

Bhattacharya, U., H. Daouk, B. Jorgenson, and C. L. Kehr (2000). When an event is not an event: The curious case of an emerging market. *Journal of Financial Economics* (January): 69-101.

Bonson, Enrique and Tomas Escobar (2006). Digital reporting in Eastern Europe: An empirical study. *International Journal of Accounting Information Systems* 7 (4) (December): 299-318.

Botosan, C. (1997). Disclosure level and the cost of equity capital. *The Accounting Review* (July): 323-349.

Bovee, Matthew, Alexander Kogan, Kay Nelson, Rajendra P Srivastava, and Miklos A Vasarhelyi (2005). Financial Reporting and Auditing Agent with Net Knowledge (FRAANK) and eXtensible Business Reporting Language (XBRL). *Journal of Information Systems* 19 (1) (Spring): 19-41.

Brown, S. J. and J. B. Warner (1980). Measuring security price performance. *Journal of Financial Economics* 8 (September): 205-258.

Brown, S. J. and J. B. Warner (1985). Using daily stock returns: The case of event studies. *Journal of Financial Economics* (March): 3-31.

Corrado, C. (1989). A non-parametric test for abnormal security price performance in event studies. *Journal of Financial Economics* 23: 385-395.

Coupland, Christine (2006). Corporate social and environmental responsibility in web-based reports: Currency in the banking sector? *Critical Perspectives in Accounting* 17 (7) (November): 865-881.

CTM (2003). Emerging Trends in Financial Reporting on the Internet. *Chartered Treasury Manager Newsletter*, Website: http://www.actm.org/ (June).

Debreceny, Roger, Glen L. Gray and Asheq Rahman (2002). The determinants of Internet financial reporting. *Journal of Accounting and Public Policy* 21 (4): 371-394.

Deller, D., M. Stubenrath, and C. Weber (1999). A survey of the use of the Internet for investor relations in the USA, UK, and Germany. *European Accounting Review* 8 (2): 351-364.

DiNapoli, Thomas P. (2007). New Internet Based Reporting System. *New York State Office of the State Comptroller*. Website: http://www.osc.state.ny.us/agencies/afrp/index.htm (May).

Fama, E.F. (1970). Efficient capital markets: A review of theory and empirical work. *Journal of Finance* (May): 383-417.

Fama, E.F., L. Fisher, M. Jensen, and R. Roll (1969). The adjustment of stock prices to new information. *International Economic Review* 10 (February): 1-21.

Financial Accounting Standards Board (FASB) (2000). Business Reporting Research Project. *Electronic Distribution of Business Reporting Information*. Norwalk, CT: FASB.

Global Researcher Worldscope: Global (2006). Website: hkkk.fi/database/accounting/research/accounting/worldscope/worldscope_quick_ref.pdf (October).

IFC (International Finance Corporation) (1992-1999). *Emerging Stock Markets Factbook.* Washington, DC: The McGraw-Hill Publishing Company. Columbus, OH.

Ismail, Mohd. A. Seetharaman, and Yee Boon Foo (2007). The Pitfalls of Internet Financial Reporting, and Their Prevention. *The Journal of 21st Century Accounting* 17 (1) (Spring/Summer): 1-19.

ITU (International Telecommunication Union) (1994-2002). *Challenges to the Network – Telecommunications and the Internet*. Geneva, Switzerland: International Telecommunications Union.

Khlifi, Foued (2007). Determinants of Internet Financial Reporting. Association for Business Communication Annual Meeting, Washington, D.C., USA (October).

Lymer, A. (1998). The use of the internet for corporate reporting: A discussion of the issues and survey of current usage in the UK. *Journal of Financial Information Systems*: 1-14.

Lymer, A., R. Debrecency, G. Gray, and A. Rahman, eds. (1999). *Business Reporting on the Internet*. A Report Prepared for the International Accounting Standards Committee. UK: IASC.

Marston, C. and C. Y. Leow (1998). Financial reporting on the internet by leading UK companies. Working paper, Heriot-Watt University: Edinburgh, UK.

Megginson, W.L. (1997). *Corporate Finance Theory*, Addison-Wesley Longman, Inc. Publishers.

Oyelere, P., F. Laswad and R. Fisher (2003). Determinants of Internet Financial Reporting by New Zealand Companies. *Journal of International Financial Management and* Accounting 14 (1): 26-63.

Pervan, Ivica (2006). Voluntary financial reporting on the internet – analysis of the practice of Croatian and Slovene listed joint stock companies. *Financial Theory and Practice* 30: 1-27.

PKF (2002). Financial Reporting on the Internet. *PKF Accountants and Business Advisors News*, Website: http://www.pkf.co.uk/ (October).

Poon, Pak-Lok, David Li, and Yuen Tak Yu (2003). Internet Financial Reporting. *Information Systems Control Journal* 1: 1-3.

Posner, M.J. (1998). *Profiting from Emerging Market Stocks*, Prentice Hall Press, Paramus, New Jersey.

Standard & Poor's Emerging Market Factbook (2000). *Methodology, Definitions, and Practices.* Emerging Markets Data Base. New York: Standard and Poor's.

Wagenhofer, Alfred (2003). Economic Consequences of Internet Financial Reporting. *Schmalenbach Business Review*, 55 (October): 262-279.