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STUDY ON THE IMPACTS OF THE
U.S. FINANCIAL CRISIS ON STOCK MARKETS IN ASIA

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ABSTRACT

The impacts of the U.S. financial crisis (2008) on Asian stock markets have been examined by using daily returns of 10 (ASEAN, non-ASEAN) stock market indexes. Some notable findings from the vector auto-regressive model are: 1) the U.S. crisis had no significant impacts on Asian markets; 2) the U.S. financial market became less dominant in Asian markets; 3) the speed of adjustment slightly increased in most Asian markets; 4) the U.S. market became less integrated with Asian markets during the U.S. crisis (i.e., much diversification benefits to be exploited in Asian markets); and 5) there were observed strong spillover effects from the U.S. market to Asian markets for the whole period. The strong volatility spillovers suggest significant negative impacts from the U.S. market to financial markets in Asia.

INTRODUCTION

In recent decades, many countries have implemented various policies to reform financial markets through liberalization, privatization, and deregulation. Financial market reforms, in general, are followed by increased capitalization and enhanced activities in domestic equity markets (Schmukler, Gozzi, and Torre, 2007). Coupled with development of new technology and increased cross-border investments, this trend helped financial markets around the world to be more integrated. Financial openness and market integration in turn disciplined economic policies and domestic financial sector to improve efficiency. The benefits of financial integration lie in more efficient way of allocating assets and sharing various risks. But empirical results suggest that the performance of most capital markets had been dismal. Thus, it has long been debated in empirical studies how major economic or financial shocks originated in one market affect other markets. Yang et al. (2003) showed that in recent decades, inter-market relationships have been greatly affected by other factors such as increased international trade and cross-border investments, and more harmonized monetary policies between countries.

The U.S. financial crisis, originated from sub-prime mortgage crisis in 2008, had spread fast to other markets, which in turn significantly affected business firms and the lives of numerous individuals around the world. The financial crisis of this nature had changed the relationships between financial markets with different degrees of developments and openness. This study is to examine the impacts of the U.S. financial crisis on stock markets in Asian countries.

One group of studies examined the impacts of the 1997 Asian economic crisis. Roca, Selvanathan, and Shepherd (1998) noted that ASEAN-5 (i.e., Indonesia, Malaysia, Singapore, Thailand,

the Philippines) markets are closely linked in the short run but not in the long run, and the two (Singapore and Thailand) markets had strong linkages with the other markets in Asia. Gosh et al. (1999) found three types of markets with distinctive features during the Asian crisis: one group (Hong Kong, Korea, and Malaysia) had been greatly affected by the U.S. market only; another group (Indonesia, the Philippines, and Singapore) by the Japanese market only; and the third group (Thailand and Taiwan) not affected by other markets. Chai (2003) reported that financial markets in Asia became more integrated during the 1990s; the US influence remained strong in Asian markets; but financial integration was not accompanied by financial efficiency in Asian market. Laurenceson (2003) found that financial markets were not strongly integrated despite strong linkages in goods/services markets between China and ASEAN-5. Worthington et al. (2003) noted that the Asian stock markets became more integrated during the Asian crisis (1997); the relationship between developed and emerging markets became rather weaker; four (Hong Kong, Japan, Korea, and Singapore) stock markets accounted for most of the causal relationships before the Asian crisis; and two (Taiwan and Thailand) markets accounted for much of the causal relationships after the Asian crisis. Yang et al. (2003) reported that both long-run cointegration and short-term causal linkages between financial markets became stronger during the Asian crisis, and the U.S. market had significant impacts on stock markets in Asia.

Kanas (2000) examined interdependency between stock markets and exchange markets around the NAFTA implementation (1994) for six industrialized countries (i.e., U.S., UK, Japan, Germany, France and Canada) and found strong volatility spillovers from stock returns to exchange-rate changes but not the other way around. Darrat and Zhong (2005) noted that Asian stock markets had long-run relationships before the NAFTA but not after its implementation. Forbes and Rigobon (2002) provided evidences of strong co-movements between stock markets after the Mexican peso crisis (1994) and the Asian crisis (1997). Fooladi and Rumsey (2006) reported that higher co-movements and integration between stock markets had been counterbal-

anced by increased volatility of exchange rates, and thus, diversification benefits (in U.S. dollars) still persisted during January 1988-June 2000.

Empirical studies thus far show that financial markets in developed countries have been fairly well integrated but not those in developing ones. And there is no strong evidence of the impacts of U.S. crisis on financial markets in Asia, the degree of financial integration, and the volatility spillovers between financial markets across nations. The objective of this study is to 1) examine impacts of the U.S. financial crisis (2008) on stock markets in Asia; 2) test for the speed of adjustments to the shock(s) caused by the U.S. crisis; and 3) analyze the volatility spillovers between the U.S. market and Asian markets. Section II provides empirical results whereas Section III concludes with a summary of notable findings.

EMPIRICAL RESULTS

This study uses daily returns of 10 stock market indexes (Finance!Yahoo) for a period of May 2005 to April 2010. The market indexes include 5 ASEAN (Indonesia, Malaysia, the Philippines, Singapore, and Thailand) indexes, 4 non-ASEAN (Hong Kong, Japan, Korea, and Taiwan) indexes, and the U.S. index. To better account for its impacts, this period is divided into 2 sub-periods: Before the crisis (2005.5~2008.6) and During the crisis (2008.7~2010.4).

The descriptive statistics of daily returns are presented in Table 1. Before the U.S. crisis, the average return for ASEAN is 16.38%, slightly lower than 17.92% for non-ASEAN markets. The average standard deviation (SD) for ASEAN is 470.69%, slightly higher than that of 458.52% for non-ASEAN markets. The coefficient of variation (as a relative risk measurement) for ASEAN is 29.06, which is slightly higher than 25.59 for non-ASEAN markets. In sum, ASEAN markets had higher risk for each percentage of return.

During the crisis, ASEAN markets posted an average return of 17.99%, which is much higher than 6.44% for non-ASEAN markets. The SD for ASEAN is 835.43%, higher than

Table 1
Descriptive Statistics (annualized) Before and During the U.S. Crisis

			US	HK	JAP	KOR	TAI	SIN	MAL	IND	PHI	THA
Before the crisis		Mean	0.0721	0.2411	0.1151	0.2508	0.1097	0.1612	0.1192	0.3847	0.1539	0.1761
		Std. Dev.	3.1255	5.1818	4.4665	4.4499	4.2724	3.7970	3.1292	5.0825	4.8150	6.7106
During the crisis		Mean	0.0191	0.0825	-0.0681	0.1339	0.1094	0.0638	0.1986	0.2018	0.2699	0.1652
		Std. Dev.	7.8234	9.0102	7.8685	7.2178	6.3723	6.6288	7.4401	7.0312	5.9393	14.7320

(Note):
ASEAN: **SIN**: Singapore; **MAL**: Malaysia; **IND**: Indonesia; **PHI**: Philippines; **THA**: Thailand. Non-ASEAN: **HK**: Hong Kong; **JAP**: Japan; **KOR**: S. Korea; **TAI**: Taiwan;

that of 761.72% for non-ASEAN markets. The coefficient of variation for ASEAN is 46.44, much lower than 118.28 for non-ASEAN markets. These results show that 1) non-ASEAN market carried much higher risk during the U.S. crisis; 2) the average return for ASEAN markets slightly increased 9.9% from 16.38% before the crisis to 18% during the crisis. For non-ASEAN markets, the average return significantly decreased 64.06% from 17.92% before the crisis to 6.44% during the crisis. One of the major factors is related to Japanese market, which experienced much lower return with higher risk (SD).

Before the crisis, Indonesia among ASEAN markets posted the highest return of 38.47% while Malaysia had the lowest return of 11.92%. During the crisis, the Philippines posted the highest return of 26.99% but Singapore had the lowest return of 6.38%. For non-ASEAN markets, Korea posted the highest return of 25.087% before the crisis whereas Taiwan had the lowest return of 10.97%. During the crisis, Korea posted the highest return of 13.39% while Japan had the lowest return of 6.44%. For ASEAN markets, the average returns slightly increased by 9.83% from 16.38% to 17.99%. The SD significantly increased as much as 77.5% from 470.69% before the crisis to 835.43% during the crisis. For non-ASEAN markets, the average return significantly decreased by 64.1% from 17.92% to -6.81%. But the SD significantly increased by 61.8% from 470.69% to 761.72% during the crisis. These

results suggest that the U.S. crisis had more significant impacts on non-ASEAN markets than ASEAN markets, and the risk (SD) increased in all Asian (ASEAN, non-ASEAN) markets.

Table 2 shows that the correlation coefficients between the U.S. and ASEAN markets decreased by 38.3% from 0.0548 to 0.0338. Before the crisis, Thai market had a negative correlation with the U.S (-0.0048), Japan (-0.0280), and Korea (-0.0230). During the crisis, 19 out of 35 correlations are negative in comparison to 3 negative ones (i.e., Thailand vs. U.S., Japan, and Korea) before the crisis. Among others, some notable negative correlations are between the U.S. and Japan (-0.0790), Hong Kong and Taiwan (-0.0678), Japan and Taiwan (-0.0895), Japan and Thailand (-0.1464), Taiwan and Singapore (-0.1398), and Thailand and Philippines (-0.1035). The correlations between the U.S. and non-ASEAN markets decreased as much as 29.4% from 0.0466 to 0.0329. These results suggest that the U.S. and Asian markets became less integrated and thus there still exist much diversification benefits to be exploited in Asian markets.

The impacts of the U.S. financial crisis on stock markets in Asia are examined in the framework of the generalized autoregressive conditional heteroskedasticity (GARCH) model (Engle (1982), Bollerslev (1986)) as follow:

$$r_{it} = a + b_{iu} * r_{ut} + e_{it} \quad (1)$$

TABLE 2
CORRELATION COEFFICIENTS FOR THE US AND ASEAN STOCK MARKETS (DURING U.S. CRISIS)

	US	HK	JAP	KOR	TAI	SIN	MAL	IND	PHI	THA
US	1.0000									
HK	0.0343	1.0000								
JAP	-0.0678	0.2863	1.0000							
KOR	0.0083	0.0076	-0.0215	1.0000						
TAI	0.0590	-0.0790	-0.0895	0.3597	1.0000					
SIN	-0.0178	0.3050	0.6223	-0.0019	-0.1398	1.0000				
MAL	-0.0194	0.0221	0.0723	-0.0277	-0.0154	0.0593	1.0000			
IND	0.0131	0.0405	0.0761	0.0589	-0.0023	0.0713	0.0189	1.0000		
PHI	0.0038	0.2194	0.5342	-0.0355	-0.0885	0.4058	0.0314	-0.0239	1.0000	
THA	0.1849	-0.0430	-0.1464	-0.0975	0.0335	-0.0647	0.0315	0.0257	-0.1035	1.0000

(Note) The correlation coefficients before the crisis are not presented here to save space but available upon request.

$$\sigma^2_{it} = w_{io} + a_{i1}\sigma^2_{it-1} + a_{i2}e^2_{it-1} \quad (2)$$

where:

r_{it} is an individual ("i^{th} country") market return;

- r_{ut} is the US-market return;

- e_t is an error term for "unexpected and idiosyncratic shock";

- s_t^2 is conditional variance;

- σ^2_{t-1} (GARCH effect) is to examine the volatility spillovers; and

- e^2_{t-1} (ARCH effect) is to test for the impacts of news ("unexpected changes").

- Empirical results are presented in Table 3. Before the crisis, the U.S. market had significant impacts on four markets, that is, Malaysia (at 1% significance level), Korea (5% level), and Hong Kong and Taiwan (10% level). During the crisis, the U.S. market had significant impact only on Hong Kong market (1% level). The coefficients (b_{iu}) show that the U.S. market became less dominant in Asian market during the U.S. crisis, and the speed of adjustment slightly increased in only 6 Asian markets.

Interestingly, the GARCH terms are significant at the 1% level for this period, which strongly support the existence of volatility spillovers from the U.S. market to Asian markets. The significant ARCH terms also support the financial contagion effects in the U.S. and Asian markets. Financial contagion suggests that a shock in one market (e.g., U.S.) caused undesirable changes and disturbances in asset market prices in other country's market (i.e., Asian markets) even though the two markets (or economies) do not share any common macroeconomic fundamentals.

Conclusion and Suggestions

This study examined the impacts of the 2008 U.S. financial crisis on stock markets in Asia. Some of notable findings are: 1) the U.S. crisis had no significant impacts on Asian markets; 2) the U.S. market became less dominant in Asian markets; 3) the U.S. market became less integrated with Asian markets during the U.S. crisis; 4) the speed of adjustment slightly increased in most Asian markets during the U.S. crisis; and 5) there were observed strong spillover effects from the U.S. to Asian markets for the whole period. The overall results show that the less dominance of the U.S. in Asian markets is in sharp contrast to other empirical studies (e.g., Worthington et al. (2003), Yang

Table 3
Empirical Results from the GARCH model

	US		e(t-1)		V(t-1)	
	Before	During	Before	During	Before	During
HK	0.0410	0.1084	0.0441	0.1214	0.9458	0.8822
(p-value)	0.0718	0.0007	0.0000	0.0000	0.0000	0.0000
JAP	0.0113	-0.0456	0.0467	0.1153	0.9427	0.8862
	0.6677	0.2289	0.0000	0.0000	0.0000	0.0000
KOR	0.0519	0.0161	0.0453	0.1162	0.9440	0.8851
	0.0273	0.6693	0.0000	0.0000	0.0000	0.0000
TAI	0.0455	0.0484	0.0491	0.1195	0.9397	0.8826
	0.0614	0.1498	0.0000	0.0000	0.0000	0.0000
SIN	0.0003	-0.0193	0.0474	0.1161	0.9417	0.8851
	0.9919	0.6528	0.0000	0.0000	0.0000	0.0000
MAL	0.1266	-0.0031	0.0470	0.1163	0.9417	0.8850
	0.0001	0.9184	0.0000	0.0000	0.0000	0.0000
IND	0.0287	-0.0290	0.0449	0.1179	0.9447	0.8834
	0.1321	0.2886	0.0000	0.0000	0.0000	0.0000
PHI	0.0096	0.0281	0.0470	0.1168	0.9421	0.8844
	0.6182	0.4937	0.0000	0.0000	0.0000	0.0000
THA	0.0002	0.0241	0.0475	0.1155	0.9417	0.8854
	0.9905	0.2018	0.0000	0.0000	0.0000	0.0000

(Note) The Ljung-Box statistics to minimize the AIC value suggest the GARCH (1, 1) model.

et al. (2003)); there still exist much diversification benefits to be exploited in Asian markets; and the strong volatility spillovers suggest significant negative disturbance of the U.S. crisis on Asian markets. It is suggested that future studies need to use more financial market data from developed and developing economies around other major events (e.g., Mexican crisis (1994), Asian crisis (1997), Russian crisis (1998), Turkish crisis (2001)).

REFERENCE

Bollerslev, T. 1986. Generalized autoregressive conditional heteroskedasticity. *Journal of Econometrics* 31(3), 307–327.

Chai, H. Y. 2003. Interactions between the Euro and Europe's Financial Markets. Asia-Pacific Journal of EU Studies 1(1).

Darrat, A. F., and M. Zhong. 2005. Equity market linkage and multinational trade accords: The Case of NAFTA. *Journal of International Money and Finance* 24(5), 793-817.

Engle, R. 1982. Autoregressive conditional heteroskedasticity with estimates of the variance of U.K. inflation. *Econometrica* 50, 987-1008.

Fooladi, I. J., and J. Rumsey. 2006. Globalization and portfolio risk over time: The role of exchange rate. *Review of Financial Economics* 15(3), 223-236.

Forbes, K., and R. Rigobon. 2002. No contagion, only Interdependence: Measuring Stock Market Co-Movement. Journal of Finance 57(5), pp. 2223-2261.

Gosh, A., R. Saidi, and K. Johnson. 1999. Who moves the Asia-Pacific stock markets–US or Japan? Empirical evidence based on the theory of cointegration. *Financial Review* 34(1), 159–170.

Kanas, Angelos. 2000. Volatility Spillovers between Stock Returns and Exchange Rate Changes: International Evidence. Journal of Business Finance & Accounting 27 (3- 4), 447–467.

Laurenceson, J. 2003. Economic integration between China and the ASEAN-5. *ASEAN Economic Bulletin* 20(2), 103-111.

Roca, E. D., E. A. Selvanathan, and W. F. Shepherd. 1998. Are the ASEAN equity markets interdependent? *ASEAN Economic Bulletin* 15(1), 109-120.

Schmukler, Sergio L., Juan Carlos Gozzi, and Augusto De La Torre. 2007. Stock Market Development under Globalization: Whither the Gains from Reforms? *World Bank Policy Research Working Paper* No. 4184;

Worthington, A.C., M. Katsuura, and H. Higgs. 2003. Price linkages in Asian equity markets: Evidence bordering the Asian economics, currency, and financial crises. *Asia-Pacific Financial Markets* 10(1), 29-44.

Yang, J., J. W. Kolari, and I. Min. 2003. Stock market integration and financial crises: The case of Asia. *Applied Financial Economics* 13(3), 477-486.

Evidence for Stalled ICT Adoption and the Facilitator eCommerce Adoption Model in SMEs

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ABSTRACT

Using both primary and secondary research, this study seeks to underline the role of facilitators in the progressive evolution and adoption of eCommerce and eBusiness among SMEs. In particular, the paper examines the role of Internet marketing as the trigger for successful facilitation of, and evolution to, richer eBusiness services. An earlier Atlantic Canadian study by Davies & Vladica (2004) introduced the notion of facilitators as the key to moving SMEs along a progressive adoption of ICT and eBusiness services. A more recent UK study (Gray, 2009), theorizes on the tremendous challenges SMEs face in eCommerce adoption, specifically with the step from having a basic web site to transacting with goods and services online. The implications for understanding and assisting SMEs is obvious; as well, policy makers can now focus their policy and program efforts beyond infrastructure building to training in services that can help SMEs overcome barriers in adoption and move up the eCommerce adoption path.

INTRODUCTION

Given the important role of Small and Medium Enterprises (SMEs) in today's economy, especially in less populated and rural regions, researchers have long sought to better understand the enablers and barriers to the adoption of Information and Communication Technologies (ICT). (Abouzeedan & Busler, 2006; Bhagwat & Sharma, 2007; Gafoor & Iqbbal, 2007; Gray, 2009; Hansen, Rand & Tarp, 2004; Kollmann et al., 2009; Levy & Powell, 2005; Ongori & Migiro, 2010; and Simmons, et. al., 2008).

Largely due to resource issues (time, money, knowledgeable personnel), these studies also suggest that SMEs are generally slower at adopting ICT than their larger counterparts. Over the past ten years, governments, universities, regional development agencies have been seeking opportunities to research and train these SMEs to incorporate more ICT into their operations. And we have known for years that the Internet and advanced ICT can improve operations and enhance market reach (Porter, 2001). With this,

the goal has been to better understand the specific factors that play a role in encouraging or inhibiting the adoption of ICT in SMEs.

The following paper examines a common pattern of ICT adoption among SMEs and the role an external advisor or expert plays in facilitating the adoption and use of more advanced ICT. Support will be sought by looking at our own research over the past six years including both qualitative and quantitative data.

In the following section, a brief literature review explores how researchers define the factors that encourage and inhibit the adoption of ICT. Some of the more recent papers in this review have been looking at models of technology adoption and their difficulty when explaining some anomalies in adoption of more advanced technologies and services. Finally, we will introduce how our own research can be used to provide a perspective on both adoption patterns generally and factors such as trusted individuals assisting with ICT adoption.

Barriers and enablers

The work of MacGregor provides a context for factors contributing to the adoption of ICT by SMEs (MacGregor et al., 2007; Kartiwi & MacGregor, 2007; and MacGregor & Kartiwi, 2010). Their earlier work started by defining the unique set of characteristics that might differentiate SMEs from larger organizations, separating these into internal or external attributes. Within the *internal* category they define eight SME attributes related to *management, decision making and planning processes,* and a further three related to *resource acquisition.* Similarly, external factors were grouped into five attributes related to *products, services* and *markets,* and three related to *risk taking* and *dealing with uncertainty.* In the end, they generated eleven internal and eight external characteristics that they argued could similarly be related to the determinants or barriers for SMEs in their adoption of ICT.

In 2007, they used these characteristics to explore whether SMEs who are organized into clusters, or who are found in developing regions of the world differ along these nineteen dimensions (MacGregor, Vrazalic, & Harvie, 2007). For example, when comparing Australian businesses, which either were or were not part of a business cluster, they found that four characteristics became barriers for ICT adoption. In particular, those businesses who were not part of an organized business cluster were more likely to report that ICT was too complicated to implement, requiring a financial investment that was too high, was not secure enough, or generally offers no advantage to their business.

In subsequent studies, they continued their look at differences between SMEs in developed or developing parts of the world by grouping specific barriers into *external* (supply barriers, demand barriers, and environmental barriers) and *internal* (resource barriers and system barriers). In 2007 and again in 2010, they found a marked difference between what barriers were most important to SMEs in developed countries (Australia and Sweden, see Kartiwi & MacGregor, 2007) and what was most important to SMEs in developing countries (Indonesia, see MacGregor & Kartiwi, 2010). In particular, SMEs in Australia and Sweden were more likely to

highlight *technical barriers,* such as lack of technical knowledge, or cost and time issues. On the other hand, SMEs in Indonesia highlighted more *organizational barriers,* such as ICT not being suitable to product/service, not suitable to their way of doing business, or not offering any advantages to their organization.

Other researchers have conducted similar studies. Kollmann et al. (2009) surveyed the literature on more than fourteen thousand businesses from ten industry sections and twenty-nine European countries to examine eight determinants thought to be factors in ICT adoption (from compatibility to organizational support to perceived usefulness). Using both secondary research and a linear regression analysis of the data, they found organizational readiness (the organization's financial and technological resources) to be a dominant predictor.

Raus et al. (2008), while looking at a very specific implementation of ICT (an eGovernment service for customs regulations), draws upon the work of Rogers' (1995) diffusion of innovations to help classify adoption. They summarized three broad categories for adoption, grouped as technological, organizational, and environmental.

Gilmore et al. (2007) provides another view, where they looked at European SMEs and the use of eMarketing by Irish companies between 2000 and 2004. First, they grouped reasons for pursuing eMarketing into *proactive reasons* (for example, eliminate disadvantages of SMEs) and *reactive reasons* (for example, competitive pressures). Then, like the work of MacGregor, they looked at barriers to ICT generally, and eMarketing specifically, grouping into three broad categories: barriers due to *general characteristics* of SMEs (lack of skills, financial support), *practical implementation and maintenance* issues (lack of focus on customer, lack of sophisticated websites), and more *organizational* barriers (partners, suppliers not up-to-date with technology).

Simmons et al. (2008) continues the marketing focus, looking at determinants for SME website adoption specifically. They argue that website adoption within SMEs is unique, and cannot be informed by adoption of larger organizations

or current marketing models. Proposing a new model, they too suggest that the determinants can be grouped broadly into individual factors (such as the SMEs owners or managers), and external, industry and business factors.

Internal versus external barriers

In Figure 1 we have summarized this cross-section of research seeking to capture the dozens of issues that potentially impede the adoption of ICT. As discussed above, these factors can be easily grouped into categories that, at the highest level, split between internal (within the business) issues, and external (outside the business) issues. On the right, the variety of internal barriers to ICT adoption can be grouped into those due to personal factors of the owner, management or leaders of the SMEs (personal barriers such as their awareness, knowledge of and attitude toward ICT solutions), those due to any number of resource limitations faced by SMEs (resource barriers such as real or perceived material and skilled resources), or those due to organizational and operational peculiarities within the SMEs (organizational barriers with the culture or operations). On the other side, there are a larger number of external barriers, that we felt group together clearly using an extended PEST (political, economic, social and technological) analysis framework (Johnson, Scholes, & Whittington, 2008).

We can also note that traditionally, the focus of governments and regional development agencies has been on external factors—that is, leveling the playing field for SMEs. For example, in both the developed and developing economic regions worldwide, there has been a (necessary) focus on infrastructure, in particular, ensuring that non-urban and rural regions have broadband Internet access is likely one of the most global approaches to reduce or minimize barriers for ICT adoption (Kruger & Gilroy, 2008; Secretariat, 2006). Yet on the issue of broadband access, there are some exciting developments worldwide. In our own region of Atlantic Canada, provincial governments have committed to and now are seeing universal broadband access across New Brunswick, a sparsely populated, largely rural province (Business New Brunswick, 2009). In other regions such as the UK, the goal remains despite government cut-backs and delayed deadlines. (Kable, 2010). There are similar examples of policies to encourage more widespread ICT adoption by tackling political, economic and social barriers, to name a few (Harindranath et. al., 2008). However, a growing number of researchers suggest that the shift in funding, policy and focus needs to look more to internal issues with the SMEs (Wielicki & Arendt, 2010). Having reviewed the range of factors that can encourage or inhibit technology adoption among SMEs, we turn now to how researchers have sought to understand and model

FIGURE 1
SUMMARY OF THE CATEGORIES OF BARRIERS TO THE ADOPTION OF ICT BY SMEs.
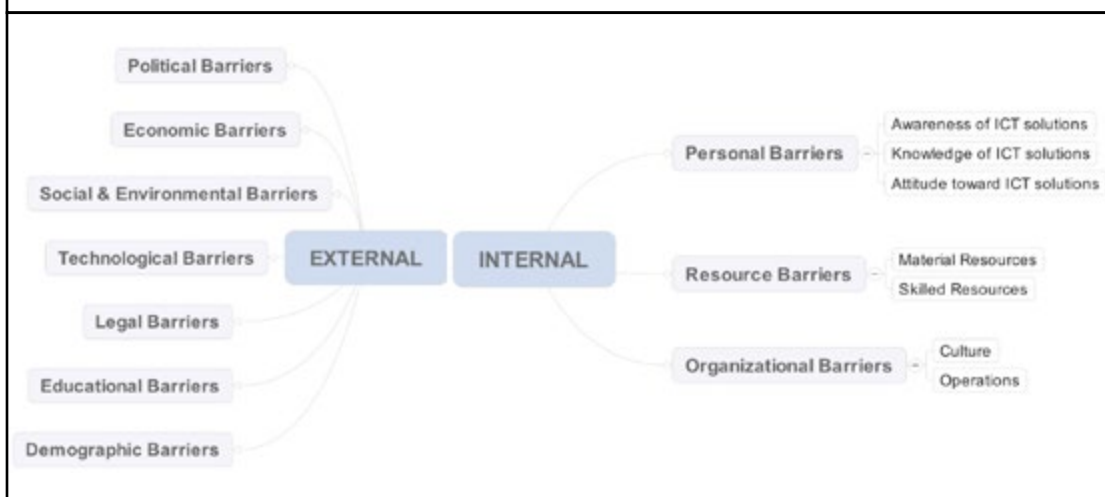
adoption. For years, researchers have struggled with whether adoption followed a linear path from basic technology and services (networked devices and connectivity) to website adoption, from eCommerce services to eBusiness integration internally and between suppliers and partners (Al-Qirim, 2003; Dixon et. al., 2002; Martin & Matlay, 2001). In the last few years, this linear model has been found particularly lacking.

Models of adoption

In 2009, Gray (2009) reviewed over twenty-five years of papers and data sources from the UK and EU, arguing that Internet and broadband adoption is in the late stage of (Roger's (1995) technology adoption, while site usage shows adoption at the early majority stage. On the other hand, the data indicated that the use of eBusiness and eCommerce by SMEs in the EU is not only at an early adoption stage, but has seemed to have stalled. Therefore, the use of ICT for marketing, procurement, customer relationship management and ERP is largely unrealized.

When looking at the various models of ICT adoption, Gray felt that the accepted linear models of ICT adoption does not easily account for what he found; in particular, the slow and stalled adoption of eCommerce and eBusiness. Another popular model of adoption, which Gray also suggests isn't supported by the data, is that the adoption of ICT is partly a social or imitative behaviour. While this argument might be used for the mass market or commodity ICT services such as Internet connectivity or broadband, it does not seem true for the more advanced adoption of eBusiness and eCommerce. This, he argues, is understandable given the unique requirements associated with these capabilities within each individual SME.

Finally, Gray suggests that adoption of eBusiness and eCommerce is more often driven by a deliberate, strategic, intention decision than logical progression or imitative responses. Essentially SMEs need to have a strong desire for the capabilities offered by advanced eCommerce and eBusiness. This is, he argues, a significant requirement to get started and not necessarily a factor driving adoption success.

The trusted facilitator

In 2005, Davis et. al. (2005) raised the issue of the *trusted facilitators* and their impact in ICT adoption in SMEs. Through a preliminary multi-variant causal factor analysis of SMEs who had successfully engaged in eCommerce or eBusiness activities they uncovered a number of material observations. First, the existence of a web site had no causal relationship to eCommerce success. This was a startling finding, yet not surprising considering the large gap which exists with SMEs who have a web site and those who are actually engaged in online eCommerce and eBusiness activities (recently found to be eighty-five percent and thirty-one percent of Atlantic Canadian SMEs in Fleet et. al., 2010). Relatively speaking, this might be understood in that web sites are rather simple and inexpensive marketing tools when compared to the complexities (or perceived complexities) surrounding transactional eCommerce capabilities. Second, and not surprising, Davis et. al. found no causal relationship between having a broadband Internet connection and successful eCommerce activities. In other words, the commodity service of broadband Internet did not engage the SME to adopt the more enhanced eCommerce or eBusiness capabilities. This is supported by research showing that the use of external or hosted websites for marketing and transactional purposes is supported by only half of those with broadband connectivity (Fleet et. al., 2010).

But Davis et. al. also summarized the extent to which *facilitators* played a role in eCommerce adoption. Facilitators can be defined as a person or persons close to a business that has or is perceived to have Internet-related expertise; to help take the complexity or perceived complexity out of the equation of adoption. Using the list of barriers shown in Figure 1, facilitators have the potential to help SMEs with both personal barriers (awareness, knowledge of and attitude toward ICT), and resource barriers (in particular, skilled resources). Davis et. al found both a direct and indirect causal relationship from facilitators to successful eCommerce at a full 0.79 points. Is it possible, then, that the existence of a *trusted facilitator* can help the SME through the often complex journey of eCommerce and

eBusiness adoption and thereby play an important factor driving ICT adoption.

Anecdotally, our own research over the past 10 years seemed to support this role of trusted facilitator, but can a post hoc examination of the qualitative and quantitative data also support this notion?

METHOD

Quantitative studies (2005, 2007 and 2010)

The University of New Brunswick's *Electronic Commerce Research and Training Centre* (ECC) is in a relatively unique position given the research it has completed over the past six years. In particular, the Centre has recently completed its third Atlantic Canadian-wide quantitative survey of SMEs and their use and adoption of ICT. What is rare is having this historic frame of reference using a largely consistent set of questions.

Each of the three Atlantic Canada studies was conducted using a secure, password-controlled web-based survey. Unique email invitations were sent to thousands of SMEs across the region inviting their participation by completing a forty-plus item questionnaire. The email addresses were culled from a range of local and federal government and business sources. The most recent 2010 study, for example, created an email database of over eleven thousand businesses.

The survey was available for completion over a period of three to four months. Regular reminders were sent to those businesses that had yet to participate. Early participation prizes were used as incentives, as were small denomination gift cards and larger technology offerings (for example, iPod touch, Netbooks).

The questions in the survey requested information on their Internet use, perceived enablers and barriers to ICT adoption, marketing and export factors, and finally general business details. The purpose of each of these surveys was to provide a benchmark of technology adoption to help frame a series of subsequent training initiatives. As such, the questions surveyed this range of issues mostly using nominal and ordinal rating scales and response types.

In order to ensure comparability between studies, the majority of questions remained unchanged in the second and third studies. Some small changes did occur, and additional questions were added to the latter surveys to explore the role of Internet marketing, and most recently (in the 2010 study), questions were asked about the use or planned use of social media. To accommodate these additional questions, some questions from the original surveys were removed in order to keep the completion duration similar to past surveys and more feasible for busy participants. Overall, the three surveys maintained over ninety percent of their content.

Qualitative study (2009)

There were also two qualitative studies conducted, one in 2009 and one in 2010. The 2009 study followed a pilot student internship program for SMEs. We had heard during the training workshops and creation of case studies with Atlantic Canadian SMEs that individuals outside the SME business (friends, relatives or trusted third parties) played a key role in assisting them to take the necessary steps to implementing more advanced ICT services (Doiron et. al, 2008). (It is worth noting that this casual, qualitative finding was used to support the federally-funded Small Business Internship Program (SBIP) in Atlantic Canada, and extended to all of Canada in 2010; Doiron et. al., 2010).

In order to study the impact of this pilot, seven SMEs who had participated in the *Internet marketing-focused* student internships were chosen (Doiron et. al., 2010). The program was such that students were matched with SMEs and assigned projects which required them to build and implement a complementary Internet marketing strategy for the firms. Owners and managers of these firms all felt that their eCommerce activities had stalled or was less than they desired them to be. The goal of the internship, therefore, was to see whether student interns could facilitate eCommerce activity within an SME through the introduction and use of relatively simple Internet marketing tactics. In addition, we were interested to see if Internet marketing might serve as a catalyst to get the SMEs excited about the potential growth the Internet represents for their business and subsequently

engage them in eCommerce related activities. In other words, this pilot is specifically designed to help the SME see Internet marketing as a deliberate, strategic, intention decision for their business

An unstructured telephone-based interview was conducted with these seven SMEs, examining the role and success of the student intern, the Internet marketing services implemented, the impact of the services, and the long-term plan for these services.

Qualitative study (2010)

In the 2010 quantitative web survey, participants were asked if they would be willing to take part in a short, follow-up, in-depth telephone survey. From the four hundred thirty-two participants, twelve SMEs were contacted, comprised of three groups of four businesses each that demonstrated an advanced, moderate, or minimal use of ICT. Their placement

into these groups was based on their responses to the various technology adoption questions. In the web survey, all participants were asked if their business currently uses technology to ensure (a) secure transactions with consumers; (b) an internal company website and communications intranet; and (c) secure business transactions with other businesses or governments. The advanced group were chosen from those businesses who answered yes to all three questions; the moderate group answered yes to one or two questions; and the minimal technology group answered no to all three questions.

The brief unstructured telephone-based interview asked what key factors they identified as important in their adoption, or lack of adoption of ICT services.

TABLE 1
THE PERCENTAGE OF ATLANTIC CANADIAN SMES THAT CURRENTLY USE A VARIETY OF TECHNOLOGIES AND SERVICES FOR THEIR BUSINESS (FROM STUDIES IN 2005, 2007 AND 2010)

Use of technologies	2005	2007	2010	Use of technologies	2005	2007	2010
Personal computer, workstations	91%	>99%	>99%	Intranet	21%	32%	45%
E-mail (electronic mail)	91%	>99%	>99%	Remote data storage	21%	29%	43%
Internet (e.g. visiting websites)	91%	>99%	>99%	Hosted software solutions	18%	27%	41%
Network/information security	78%	90%	94%	Network conferencing (video)	16%	25%	39%
Functional software packages	74%	88%	88%	Extranet	9%	19%	20%
Wireless internet (WiFi)	59%	64%	76%	Remote help desk assistance	16%	14%	20%
Shared file folders	51%	67%	70%	Biometrics (e.g. finger-prt scans)	1%	5%	5%
Secure business transactions	42%	55%	62%	Radio Frequency ID (RFID)	4%	3%	5%
Secure consumers transactions	31%	34%	46%				

RESULTS

Rapid and slow adoption rates

Our data show that over six years, SMEs in Atlantic Canada have demonstrated areas where ICT adoption is quite dramatic (Fleet et. al., 2010). These same data, though, show other technologies and services that have growth at a much slower rate. In particular, we see considerable growth in the commodity technologies and services (broadband Internet, email and web browsing, even web site adoption), while levels of eCommerce adoption and integrated eBusiness solutions are growing much more slowly (see Table 1 and Figure 2). While Table 1 provides the exact percentages for adoption, the same data presented graphically in Figure 2 allow for comparisons of adoption that is rapid or slow.

The adoption of social media and Internet marketing services

In the 2010 survey, we introduced a series of new questions asking SMEs about their adoption and use of a variety of social media tools and services. Table 2 provides a summary of the percentage of SMEs who indicated they have adopted any of these fourteen marketing services. As can be seen from the table, Atlantic Canadian SMEs use a wide variety of online marketing services, though none are used by a majority of businesses (for example, a site search engine is the most popular with less than 50 percent adoption). On the other hand, the use of these services is more widespread than one might anticipate given that many of these services have only reached popular awareness in the last few years.

We also asked a number of additional questions about these specific marketing services, such as: what they felt the impact of these services

FIGURE 2
THE PERCENTAGE OF ATLANTIC CANADIAN SMES THAT CURRENTLY USE A VARIETY OF TECHNOLOGIES AND SERVICES FOR THEIR BUSINESS (FROM STUDIES IN 2005, 2007 AND 2010)
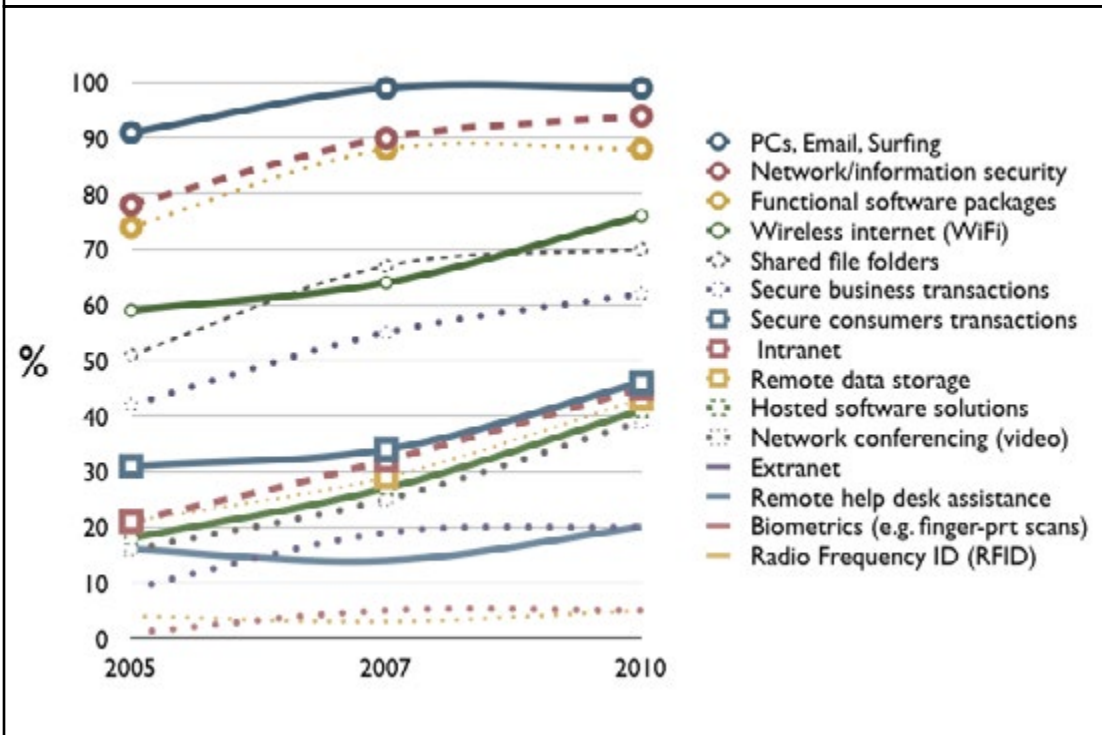
TABLE 2 — THE PERCENTAGE OF ATLANTIC CANADIAN SMES THAT CURRENTLY USE A VARIETY OF MARKETING SERVICES FOR THEIR BUSINESS (FROM 2010 STUDY ONLY).			
Use of marketing services			
Site Search Engine	43%	Social Networking	30%
Web analytics	40%	Multimedia Content	28%
Online Customer Communications	40%	Dynamic Content	28%
Content Management System	38%	Online Demos	20%
Email campaigns	37%	Multiple Language Options	17%
Online Promotions	33%	Pay per click	13%
Search Engine Optimization	31%	Specialized Web Techniques	4%

were on their sales; what factors lead them to adopt these services; and whether the adoption was part of a formal marketing plan. Of those who use these services, no one indicated that adoption resulted in a *decrease* in sales. While the majority said there was no change (either measured or perceived), yet for the top eleven services between twenty-five and fifty percent of SMEs indicated an *increase* in sales.

We further inquired about the drivers for the adoption of marketing services, which potentially demonstrates the propensity for trusted facilitators of ICT. Our respondents were asked which of four factors were important in their decision to use these web marketing services. If we group these factors by those that involve a more personal interaction (workshops and recommendations) versus those drivers that are more impersonal and external (competitive environment and advertising), we see that web analytics, search engine optimization, and multimedia content all seem to be adopted with a high percentage of workshop and personal recommendations. This suggests that trusted facilitators were more important with choosing and implementing these services than for services such as pay per click or content management

systems (where advertisements and competitive pressures seem to more important).

Future technology adoption

A comparison of the 2010 data with that of previous years, especially on the question of what technologies and services SMEs plan on adopting the service in the near future, show some considerable changes in opinion. In Table 3, there is a list of fourteen ICT services, and the corresponding change in percentage of those SMEs planning to adopt. It can be noted that interest in many of these fourteen services has doubled since the 2007 survey (for example, while website design interest only grew six percent between 2005 and 2007, it jumped to twelve percent between 2007 and 2010). In fact, three services (website development, promotional/Internet marketing services, and customer support) grew by fourteen percent and fifteen percent after showing only a three to five percent interest previously. This growth in optimism is mirrored by the answer to the question option 'I have no plans in this regard'. In 2005 over one-third of the sample failed to see these technologies as part of their companies

TABLE 3
THE PERCENTAGE OF ATLANTIC CANADIAN SMES THAT INDICATED THEY PLAN, IN THE NEAR FUTURE,
TO USE A VARIETY OF TECHNOLOGIES AND SERVICES FOR THEIR BUSINESS
(FROM STUDIES IN 2005, 2007 AND 2010).

Planning to use in near future	2005	2007	2010	Planning to use in near future	2005	2007	2010
Website design	27%	33%	45%	Technical consulting	8%	16%	26%
Website content development	28%	30%	44%	Delivery fulfillment and order tracking	12%	15%	19%
Promotional/Internet marketing services	24%	28%	43%	Security/Access management	9%	13%	16%
Internet marketing Strategy	-	-	42%	Business process integration	7%	8%	14%
Payment services	21%	29%	39%	Catalogue management	9%	14%	13%
Customer support	18%	23%	37%	I have no plans in this regard	34%	28%	13%
Hosting	8%	19%	28%	Other	3%	3%	4%
Shopping cart	11%	18%	26%				

near-term plans; but this year, that number had dropped to a mere thirteen percent.

Student interns as facilitators (2009)

As noted previously, in 2009 the University of New Brunswick's ECC began a program where students worked with SMEs to develop Internet marketing opportunties. There were four important elements to these internships: (i) All SMEs in this study had websites. (ii) Both students and a representative from the SME were required to sit through a one-day Internet marketing seminar at or near the start of the internships. (Note: these seminars alone had proven successful in assisting SMEs to adopt Internet marketing tactics or practices. For example, results following a series of training seminars which engaged over four hundred and fifty SMEs showed that over sixty-five percent of the attendees engaged in one or more Internet marketing tactics). (iii) Students were then asked to build an Internet

marketing strategy for the SME. (iv) Once approved by the owner/manager the students began the exercise of implementing the identified Internet marketing tactics.

Most SMEs began by implementing *Google Analytics,* which is used to monitor and measure a web site's traffic and effectiveness. Various other tactics were employed, including *Facebook™* pages, *Google Adword™* campaign's, email marketing campaigns and various search engine optimization activities. Success of these internships was measured in various ways, the most important of which was in increase in Internet originated sales for the SME.

The results showed that five of the seven internships were successful. On average the interns implemented three Internet marketing tactics for their employers and all five SMEs who participated continued to utilize the Internet marketing tactics after the internship finished. One important note is that none of the students had

any experience in Internet marketing prior to the internship; that is, they essentially executed these tactics for the first time.

Follow-up telephone interviews (2010)

The last set of results came from the telephone interviews that followed the 2010 web survey. The 12 SMEs who participated, comprised of three groups of four businesses each that demonstrated an advanced, moderate, or minimal use of ICT (based on their responses to various technology adoption questions in the web survey). The advanced group identified three factors that precipitated their level of ICT adoption: self-training and education, external training, and finally in-house or external facilitators. The moderate group also identified self-interest and self-training as key, as well as the attraction or promise of larger or more accessible markets. Finally, the group that demonstrated minimal adoption of ICT were asked what factors have held them back. Not surprisingly, lack of skills and/or knowledge, budget or financial constraints, time, and the size of their business (for example, owner-operated).

DISCUSSION

In exploring the idea that slow or stalled eCommerce and eBusiness adoption can be reversed by a trusted facilitator, our data are not conclusive. Yet, we have tried to provide a series of supporting arguments from the literature and from our research (both quantitative and qualitative).

Our data do show that different technologies are adopted by SMEs to differing degrees, and that over a five-year period, specific technologies show a range of adoption levels as well as demonstrate various growth rates. We can see that a number of technologies have reached or are nearing saturation levels in Atlantic Canadian SMEs (for example, PCs, email, web, security, functional software packages). Even website adoption is now well over eighty percent in our 2010 data (Fleet et. al., 2010). Yet other technologies do not demonstrated the same level or growth in adoption.

We also found in our most recent 2010 study that many Internet marketing and social media technologies are being used (ranging between thirty and 43 percent adoption by SMEs. We believe that the ease of use and low cost of these services have played a role, but our data also found that the human training and workshops and personal recommendations were identified as important for these new technologies.

Earlier, we described the literature where organizational readiness, and deliberate planning were pre-requisites or determinants of ICT adoption. Our own data showed a dramatic increase in interest in adopting specific technologies and services, which when coupled with inexpensive, easy to install/use services, and trusted facilitators, provides a compelling formula for the adoption of more advanced ICT.

This argument is best demonstrated by the successful student internship program (SBIP). Businesses keen to find ways to make the Internet work for them, have been trained on Internet marketing approaches, and been provided with trusted facilitators to assist them with implementation and operational details. (See Doiron et. al, 2010 for more details about the program and its success).

Together, we would propose these findings indicate a unique hypothesis that deserves research, examination and discussion.

The implication of these ideas for policy makers is very direct; they can now focus their policy and program efforts on Internet marketing facilitation, which will be the new defining factor in helping SMEs overcome barriers in adoption and move up the eCommerce adoption function.

At the same time, the value for SMEs and local economies is significant. For many SMEs, eCommerce and eBusiness adoption is stalled even though they have invested in web sites. Moving them up the adoption curve will serve to help them to better compete regionally, to export their products and/or services and to open up new markets and opportunities for their businesses. Focusing initial facilitation efforts on Internet marketing tactics may be a worth-

while facilitation strategy which can drive significant near term results.

REFERENCES

Abouzeedan, A. and Busler, M. (2006). Information Technology (IT) and Small and Medium-sized Enterprises (SMEs) Management: The Concept of "Firm Impact Sphere." *Global Business Review*, 7(2), 243–257.

Al-Qirim, N. A. Y. (2003). *Electronic Commerce in Small to Medium-Sized Enterprises: Frameworks, Issues and Implications* (p. 392). Information Science Publishing.

Bhagwat, R. and Sharma, M. K. (2007). Information system architecture: a framework for a cluster of small- and medium-sized enterprises (SMEs). *Production Planning & Control*, 18(4), 283-296.

Business New Brunswick. (2009). Schedule provides timeline for high-speed Internet access for rural *New Brunswick* (09/06/08). Retrieved July 29, 2010, from http://www.gnb.ca/cnb/news/bnb/2009e0818bn.htm

Chambers, E.J., and Shaw,W.J. (2008). Reaching Out: Exploring SME Exporting Opportunities and Challenges. *WCER Bulletin* 109. April pp. 1-76

Davis, C. and Vladica, F. (2004). Adoption of Internet Technologies and e-Business Solutions by Small and Medium-Sized Enterprises in New Brunswick. Commissioned report. pp. 1-68

Davis, C. and Vladica, F. (2005). Adoption and Use of Internet Technologies and e-Business Solutions by Canadian Micro-enterprises. Proceedings of the Conference of the International Association for the Management of Technology [IAMOT] pp. 1-16

Doiron, D., Fleet, G., and Paul-Elias, V. (2010). E-Commerce Adoption through a National Student Internship Program: A Case Study Demonstrating How Internet Marketing Focused Student Internships Facilitate Successful Ecommerce Adoption Canadian SMEs, Proceedings for ISBE 2010, London.

Dixon, T., Thompson, B., and McAllister, P. (2002). *The Value of ICT for SMEs in the UK: A Critical Literature Review* (pp. 1–28). Small Business Service Research Programme. Retrieved from http://www.bis.gov.uk/files/file38315.pdf

Fleet, G., Doiron, D., Williamson, M., Mendelson, M. (2010). The fantastic growth of broadband and ICT in Atlantic Canada. Proceedings for ISBE 2010, London.

Ghafoor, Z. and Iqbal, M. (2007). Role of the Internet in SME Growth Strategies: Case Studies of Swedish Companies, Masters Thesis, Lulea University of Technology. see http://epubl.ltu.se/1402-1552/2007/064/LTU-DUPP-07064-SE.pdf

Gilmore, A., Gallagher, D., and Henry, S. (2007). E-marketing and SMEs: operational lessons for the future. *European Business Review,* vol. 19 (3) pp. 234-247

Gray, C. (2009). ICT Adoption, Entrepreneurship and e-Business Diffusion in SMEs. Proceedings for ISBE 2009 Conference. pp. 1-19.

Hansen, H., Rand, J. and Tarp, F. (2004). SME growth and survival in Vietnam: Did direct government support matter? Discussion Paper 04-13, Department of Economics, University of Copenhagen.

Harindranath, G., Dyerson, R., and Barnes, D. (2008). ICT adoption and use in UK SMEs: a failure of initiatives? Electronic Journal Information Systems Evaluation, Volume 11 Issue 2, pp. 91 – 96.

Hofstede, G. (2001). *Culture's Consequences. Comparing Values, Behaviours, Institutions, and Organizations across Nations,* 2nd edition, Thousand Oaks, CA, Sage Publications.

Johnson, G., Scholes, K., and Whittington, R. (2008). *Exploring Corporate Strategy* (8th ed. p. 622). Harlow, UK: Financial Times / Prentice Hall.

Kable. (2010, July 16). Broadband target put back to 2015. *The Guardian*, Deadline for broadband in all UK homes by 2012 put back by Tory culture secretary Jeremy Hunt, who says Labour's plan was impractical, 1–2.

Kartiwi, M. and MacGregor, R.C. (2007). Electronic commerce Adoption barriers in small to Medium-sized Enterprises (SMEs) in Developed and Developing countries: A cross-country comparison. *Journal of Electronic Commerce in Organizations,* vol. 5 (3) pp. 35-51.

Kollmann,T., Kuchertz, A., and Breugst, N. (2009). Organizational readiness and the adoption of electronic business: the moderating role of national culture in 29 european countries. SIGMIS Database. vol. 40 (4).

Kruger, L., & Gilroy, A. (2008). *Broadband internet access and the digital divide: Federal assistance programs. Broadband Internet: Access, Regulation and Policy.* Congressional Research Service.

Levy, M. and Powell, P. (2002). SME Internet Adoption:Towards a Transporter Model. 15th Bled Electronic Commerce Conference: eReality: Constructing the eEconomy. pp. 1-15

MacGregor, R.C. and Kartiwi, M. (2010). Perception of Barriers to e-Commerce adoption in SMEs in a Developed and Developing Country: a Comparison Between Australia and Indonesia. *Journal of Electronic Commerce in Organizations,* vol. 8 (1) pp. 61-82

MacGregor, R.C., Vrazalic, L. and Harvie, C. (2007). The Perception of Barriers to E-commerce in Australian SMEs: Relationships to Small Business Cluster Membership. *Conference proceedings from the 4th SMEs in a Global Economy Conference* pp. 1-18.

Martin, L. M., and Matlay, H. (2001). "Blanket"_approaches to promoting ICT in small firms: some lessons from the DTI ladder adoption model in the UK. *Internet Research*, 399-410.

Ongori, H and Migiro, S. (2010). Information and communication technologies adoption in SMEs: literature review. Journal of Chinese Entrepreneurship, vol. 2, issue 1, pp. 93-104.

Porter, Michael E. (2001). 'Strategy and the Internet', Harvard Business Review, 79(3), 63–78.

Raus, M., Flugge, B., and Boutellier, R. (2008). Innovation steps in the diffusion of e-customs solutions. dg.o '08: Proceedings of the 2008 international conference on Digital government research.

Rogers, E.M. (1995). *Diffusion of Innovations,* 3th edition, New York, NY, Free Press.

Secretariat, U. (2006). Information Economy Report 2006. *UNCTAD/SDTE/ECB/2006/1*, 1–346.

Simmons, G., Armstrong, G.A., and Durkin, M.G. (2008). A Conceptualization of the Determinants of Small Business Website Adoption: Setting the Research Agenda. International Small Business Journal, vol. 26 (3) pp. 351-387.

Wielicki, T. and Arendt, L. (2010). A knowledge-driven shift in perception of ICT implementation barriers: Comparative study of US and European SMEs. Journal of Information Science, vol. 36 (2) pp. 162-174

Applying Multiple-Case Study for Theory Building: Exploring an Interpretive Approach in Information Systems

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ABSTRACT

This paper aims to explore the advantages of case study in explaining the phenomena of strategic alignment in the Information Systems area. An interpretive approach is used to explore the contextual meaning within which the predictive variables are actually hidden in the cases. Data were gathered from field interviews of selected resource persons in the target companies combined with secondary data such as company reports and documentations. The elaboration of textual data derived from the study relies on an intentional analysis in order to explore the dynamic process of strategic alignment in companies. The study supports the arguments of using case studies as elaborative method to discover some evidences and complex phenomena in Information Systems.

Key Words: Case Study, Interpretive Approach, Intentional Analysis, and Theory Building

INTRODUCTION

The case study (Yin, 2003) and survey (Baroudi, 1986) methods have seen extensive application in Information Systems (IS). The case study approach refers to a group of methods which emphasize qualitative analysis (Yin, 2003). Data are collected from a small number of organizations through methods such as participant-observation, documents, artifact, in-depth interviews, or longitudinal studies. Researchers using a case study for research purposes have to prepare for some strong arguments to overcome criticisms of the methods.

Case studies have been denigrated as having insufficient precision (i.e., quantification), objectivity, or rigor. To overcome this stereotype of case studies as a weak method, investigator must exercise a great care in designing and doing case studies and accompanied the case studies by theory and logical inquiry (Yin, 2003). Suggestions that came from the author who operates from a positivist stance throughout his book are not only addressed to positivist researches, but also to interpretive researcher intending to develop a theory through an inductive thinking process as well.

Researchers using case study method ought to be aware of the logic behind theoreti-

cal sampling as opposed to statistical sampling, and theoretical generalization as opposed to statistical generalization. The key idea related to theoretical sampling involves comparison of cases. Theoretical sampling is necessitates in developing interpretative theories from the emerging data and selecting a new sample to examine and elaborate on this theory. It is the principal strategy for the grounded theoretical approach but will be used in some form in most qualitative investigations necessitating interpretation (Marshal, 1996).

Interpretive researchers intending to build or develop a theory need to do more than just adopting the criteria proposed to overcome the aforementioned criticisms of case study, such as construct validity, internal validity, external validity, and reliability (Yin, 2003). Interpretive researchers also need to make some adaptations to the case study guidelines.

THEORETICAL PERSPECTIVES

Underlying Philosophical Assumptions

An important aspect that may influence the choice of a research method is the philosophical lens that is used to frame the investigation. Throughout the literature about approaches to IS research, there have been papers that explore this influence. Some authors described the three lenses through which IS research can be conducted (Orlikowski and Baroudi, 1991; Chua, 1986).

The positivist perspective, which has its roots in the natural sciences, assumes that an objective physical and social world exists independent of humans and can be objectively characterized and measured. Positivist studies are premised on the existence of a priori relationships within phenomena that are typically investigated with structured instrumentation (Orlikowski and Baroudi, 1991). This perspective, are an important paradigm to distinguish between studies that were theoretically grounded and those that are only aimed at describing a phenomenon (Orlikowski and Baroudi, 1991).

An interpretive perspective emphasizes that reality is socially constructed and open to various interpretations both by actors and researchers (Walsham, 1995). A researcher adopting such a perspective seeks to develop a thorough understanding of a phenomenon within a particular cultural and contextual setting. The intent is not to generalize but to understand the deeper structure of a phenomenon (Orlikowski and Baroudi, 1991).

The critical perspective is based on the notion that people have unfulfilled potential and can act to change their social and material environment (Orlikowski and Baroudi, 1991). It seeks (according to Cecez-Kecmanovic, 2001) "to achieve an emancipator social change by going beyond the apparent to reveal hidden agendas, concealed inequalities and tacit manipulation involved in a complex relationship between IS and their social, political and organizational contexts".

Interpretive in Information Systems

The emergence of interpretive in information system research is seen as gaining ground at that point against a predominantly positivist research tradition in IS (Walsham, 1995). Within interpretive research theory plays a crucial role in interpretive research in IS, and used as a 'sensitizing device' to view the world in a certain way (Klein and Myers, 1999), and the researcher's interpretation role is bringing "such subjectivity to the fore, backed with quality arguments rather than statistical exactness" (Garcia. 1997).

The interpretive view share the goal of understanding the complex world of lived experience from the point of view of those who live it. This goal is variously spoken of as an abiding concern for the life world, for the emic or insider's perspectives point of view, for understanding meaning, and for grasping the actor's definition of a situation Schwandt, 1994). The foundation assumption for interpretive research is that knowledge is gained, or at least filtered, through social constructions such as language, consciousness, and shared meanings (Walsham, 1995). In addition to the emphasis on the socially constructed nature of reality, interpretive research acknowledges the intimate relationship between the researcher and what is being explored, and the situational constraints shaping this process (Mingers, 2001; Klein and Myers, 1999).

Qualitative-interpretive approach

Qualitative and interpretive approaches are not, by all means, equivalent and interchangeable terms (Klein and Myers, 1999). Qualitative research encompasses many interpretive paradigms, each reflecting different epistemological, ontological and methodological assumptions and beliefs

Understanding and being explicit about these underlying premises is important in order that the research design achieves congruency between the theoretical paradigm, strategies of inquiry, and methods for data collection. Qualitative research is a broad umbrella term for research methodologies that describe and explain the experiences, behaviors, interactions and social contexts of a person (Strauss and Corbin, 1990) without the use of statistical procedures or quantification. Therefore, qualitative research may or may not be interpretive depending upon the philosophical assumptions of the researcher (Klein and Myers, 1999).

CASE STUDY DESIGN

Strategies of inquiry provide the link between a study's underlying paradigm and the methods used to collect the "empirical materials" Schwandt, 1994). A case study is but one of several ways of doing research. In general, "case studies are the preferred strategy when how or why question are being posed, when the investigator has little control over events, and when focus is on a contemporary phenomenon within some real-life context" (Yin, 2003).

The case study design can include a single, in-depth pilot case study followed by cross-case analysis of several firms. Problems and issues identified in the pilot case study can be pointed to an important variable for further investigation. These subsequent multiple case study, have the objective of testing a tentative pattern of important variables identified from the pilot case and the literature. It is conducted in a natural setting, without intentionally manipulating the environment, provide researchers with opportunities to unveil specific, unique contextual conditions, and allow researchers to grasp a holistic understanding of a phenomenon under investigation (Andrade, 2009).

It typically involves highly detailed rich descriptions of human behavior and opinions. With regard to analysis, data was organized "around the substantial topics of the case study" by first reviewed and coded in terms of its relationship to the organizational factors identified [Yin, 2003; Merriam, 1998), whereas the resultant data display tables represent a crucial link in the chain of evidence between the raw data and the subsequent analysis and development of conclusions (Yin, 2003).

Interpretive Case Studies

The use of the case study research approach is widespread in the IS community. The case study approach is multi-faceted and may be applied and used in a number of different ways (Darke, Shanks, and Broadbent, 1998). Case studies can be undertaken from a positivist or interpretive paradigm, may be deductive or inductive, may involve single or multiple cases using literal or theoretical replication and may use qualitative and quantitative data. Case study is one of the primary research designs for IS research, besides laboratory experiments and surveys.

In fact case study research is the most common and valuable interpretive-qualitative approach to studying IS in organization, and more strongly that it is a better method than positivism for this purpose (Orlikowski and Baroudi, 1991). Case study is also attributed as "the most appropriate method for conducting empirical research in the interpretative tradition is the in-depth case study" (Walsham, 1995) and that "positivist criteria...are inappropriate for interpretive research" (Klein and Myers, 1999).

In qualitative-interpretive case studies the researcher is directly involved in the process of data collection and analysis (Klein and Myers, 1999). It provides an opportunity to get a deep insight into the problem under study because "an interpretive explanation documents the [participant's] point of view and translates it into a form that is intelligible to readers" (Newman, 1997). Indeed, interpretive research makes it possible to present the researcher's own constructions as well as those of all the participants (Walsham, 1995).

Developing Theory with Cases

The emergence of interpretive in information system research is seen as gaining ground at that point against a predominantly positivist research tradition in IS (Walsham, 1995). Within interpretive research theory plays a crucial role in interpretive research in IS, and used as a 'sensitizing device' to view the world in a certain way (Klein and Myers, 1999), and the researcher's interpretation role is bringing "such subjectivity to the fore, backed with quality arguments rather than statistical exactness" (Garcia, 1997).

The interpretive view share the goal of understanding the complex world of lived experience from the point of view of those who live it. This goal is variously spoken of as an abiding concern for the life world, for the emic (or insider's perspectives) point of view, for understanding meaning, and for grasping the actor's definition of a situation Schwandt, 1994). The foundation assumption for interpretive research is that knowledge is gained, or at least filtered, through social constructions such as language, consciousness, and shared meanings (Walsham, 1995). In addition to the emphasis on the socially constructed nature of reality, interpretive research acknowledges the intimate relationship between the researcher and what is being explored, and the situational constraints shaping this process (Mingers, 2001; Klein and Myers, 1999).

DATA ANALYSIS AND INTERPRETATION

According to Yin (2003), there are various approaches to qualitative data analysis, some being more suited to certain situations than others; triangulation between data sources (data triangulation) or among different evaluators (investigator triangulation), as well as analysis, coding and data displaying (Miles and Huberman, 1994).

There are also three general approaches to text analysis with each being dependent on assumptions to include the role of the researcher: for positivistic view (content analysis, verbal protocol analysis, script analysis), linguistic (speech act analysis, discourse analysis) and interpretive (hermeneutics, intentional analysis) approaches (Lacity and Jansen, 1994).

Intentional analysis is a form of interpretive data analysis that attempts to understand the speaker's intention. It assumes the research and interview have similar background in the research subject allowing the research to better understand the contextual factors that influence the research subject (Lacity and Jansen, 1994). Intentional analysis allows the researcher to discuss with the participants the meaning they ascribe to their experiences. This method is particularly appropriate for analyzing data collected in interviews and consists of four steps of analysis; described as follows (Lacity and Jansen, 1994):

In the first step of the intentional analysis, the researcher describes the 'facts' of the phenomenon. 'Facts' are socially shared realities agreed upon by

Tabel 1 Lacity text analysis framework					
Assumptions					
Text analysis approaches	**Research Methods**	**Nature of the Text**	**Role of Researcher**	**Validity Check**	**Examples**
Positivist	Identification of nonrandom variation	Objectives	Outsider	Quantitative	• Content analysis • Verbal protocol analysis • Script analysis
Linguistics	Study language relationship	Emergent	Outsider	Primarily qualitative	• Speech act analysis • Discourse analysis
Interpretivist	Analyses the cultural	Subjective	Insider	Qualitative	• Hermeneutics • Intentional analysis

all participants. For example, in this case, the planning manager, the deputy director of IT, and employees may all attest to the "fact" that the SIGT (stands from System Information Gardu dan Trafo, a geographical based information systems and specific decisions support systems) implementation caused a change to their working environment.

In step two, the researcher determines the way participants ascribe meaning to their separate realities by how they perceive cause and effect. For example, in the case study, the planning manager and the deputy director of IT may attribute the SIGT implementation as a necessity created by a dominant pressure for performance indicator, whereas the employee may believe that the SIGT development and installation was based on firm's preference for an IT solution above a manual system.

In step three, the researcher identifies themes-(or invariants) that emerge from the text. The researcher then identifies themes that are used to develop common interpretations for an entire class of phenomena. Considering the large amounts of non-standard data produced, data analysis consisted of the identification and development of themes, rather than analyzing data based on an external, pre-defined structure. This process was supported by the early conception of the learning framework to guide research focus. As analysis progressed, the researcher identified relationships that connected portions of description, verified through field notes, with explanations offered in the working model, in order to develop common interpretation.

In step four, the researcher abstracts the "essences" from the text. Essences are wholly subjective gestalts what is learned from studying the phenomenon. Abstracting essences requires creativity, intuition and reflection. The researcher no longer asks "What do the participants think about the phenomenon?" but rather, "What do I think?" (Lacity and Jansen, 1994). Thus, analysis depends on an investigator's own style of a rigorous thinking (Yin, 2003). After the evidence from the triangulated resources were collected the responses for the research question are coded and tabulated in order to make some comparison in a cross-case analysis manners.

EXERCIZING THEORY BUILDING

Strong recommendation stated that researchers can take their previous knowledge into account, either from the existing literature or from their previous experience. It can be used as a guide during the process of forming a theoretical basis for the approach to the issue to be studied (Eisenhardt, 1989, Walsham, 1995). Although some researchers may mistakenly assume that exploratory study suggests getting into the field without reviewing the literature, it is a serious misunderstanding of the technique (Urquhart, 2007). Siggelkow (2007) explains exploratory study should take the stance that "our observations [are] guided and influenced by some initial hunches and frames of reference" and emphasize that "an open mind is good; an empty mind is not".

Interpretive researchers have to keep in mind for not just impose previous theories when analyzing the data instead of generating original categories; it informs the researchers' ideas and helps them to produce a preliminary theoretical framework that should be regarded as a "sensitizing device" (Klein and Myers, 1999), which can only be modified according to the actual findings; that may result in an unintentional discovery.

The literature also reminds the researchers for not to lose theoretical sensitivity (Glaser and Strauss, 1967) since theoretical sensitivity will provide the "awareness of the subtleties of meaning of data" and elaborate that "one can come to a research situation with varying degrees of sensitivity depending upon previous reading and experience with or relevant to that area."

Researchers ought to implement some evaluations concerning the relevance of their preliminary theoretical framework face-to-face the actual findings (Urquhart, 2007). It was suggested that "the preliminary literature review is conducted on the understanding that it is the generated theory that will determine the relevance of the literature" (Urquhart and Fernandez, 2006). And for that reason, it supposed to be revisited and contrasted to the emergent theory from the data.

Conducting research using interpretive case study

Interpretive case studies provide researchers with vehicle to develop theory by applying "an exploratory, fluid and flexible, data driven and context sensitive" approach (Mason, 1996). Nevertheless, a good research design should make answerable, decisions concerning the research questions, unit of analysis, sampling strategy, data collection strategy, analysis and management of data, and justification for conducting the research using this methodology from the beginning to enable further strategy decisions to be made if needed (Mason, 1996).

TABEL 2			
VALIDITY FOR INTERPRETIVE CASE STUDY APPROACH			
Criterion	**Definition**	**Specific case study tactic**	**Interpretive approach**
Construct validity	Establishing correct operational measures for the concepts being studied	Use multiple source of evidence Establish chain of evidence Have key informants review draft case study report	Confirmability: triangulation is considered to be a key criterion for confirmability: an extent to which the researcher admits his or her own predispositions [14]. Emphasizing the role of triangulation in promoting such confirmability is desirable in order to reduce the effect of investigator bias.
Internal validity	Establishing causal relationship as distinguished from spurious relationships	Do pattern matching Do explanation-building Address rival explanations Use logic models	Credibility: Pattern-matching, by which the researcher compares an observed pattern against a predicted one, is regarded as a valuable tactic for case study analysis, while explanation building is considered as a special type of pattern matching [1].
External validity	Establishing the domain to which a study's findings can be generalized	Use theory in single-case studies Use replication logic in multiple-case studies	Transferability: Generalizing implies going "from particular instances to general notions" [29], and interpretive researchers should include the temporal and spatial dimensions of the phenomenon under study in their analysis in order to produce theoretical generalizations [4]. Either from one case or from multiple cases, they intend to produce theoretical generalizations instead of testing theory.
Reliability	Demonstrating that a study can be repeated with the same results	Use case study protocol Develop case study database	Dependability: Presenting the chain of evidence contributes to the trustworthiness of the analysis. Indeed, reliability for qualitative research "means producing results that can be trusted and establishing findings that are meaningful and interesting to the reader" [32] instead of showing consistent results by repeated analyses.

Having developed research questions for the case study, the next element that needed to be consider is unit analysis. The "key issue in selecting and making decisions about appropriate unit analysis is to decide what it is you want to be able to say something about at the end of the study" (Patton, 1990). After the unit analysis had been defined, the sampling strategy needed to address the research questions must be identified. Interpretive case study tended to rely upon purposeful sampling rather than random sampling. Purposeful sampling involved an in-depth study of small samples of people that were situated in their context (Miles and Huberman, 1994). Researcher then moving to the next elements involving data to be collected and then analysis that lead to the theory produced.

Validity Consideration

In the interpretive research paradigm, a primary focus is for researchers to capture authentically the lived experiences of people, and it is noted that "Such experience, it is argued, is created in the social text written by the researcher. This is the representational problem. It confronts the inescapable problem of representation, but does so within a framework that makes the direct link between experience and text problematic" Schwandt, 1994). Part of their solution to the validity issue has been to rearrange traditional quantitative validity concepts and to use labels that are more acceptable to qualitative researchers (Lincoln and Guba, 1985). One set of criteria includes the following types: confirmability (to replace the quantitative concept of objectivity), credibility (to replace for the quantitative concept of internal validity), transferability (to replace the quantitative concept of external validity), and dependability (to replace the quantitative concept of reliability).

Confirmability

The concept of confirmability is the qualitative investigator's comparable concern to objectivity. Here steps must be taken to help ensure as far as possible that the findings in this work are the result of the experiences and ideas of the informants, rather than the characteristics and preferences of the researcher. Triangulation is considered to be a key criterion for confirmability:

an extent to which the researcher admits his or her own predispositions (Miles and Huberman, 1994). Emphasizing the role of triangulation in promoting such confirmability is desirable in order to reduce the effect of investigator bias.

Although case study approach recognizes the problematic nature of defining a correct "operational set of measures" (Yin, 2003), it does not discard it at all. Instead, the case study design proposes using multiple sources of evidence in a triangulation fashion in order to contribute to addressing any potential problem: "data triangulation….essentially provides multiple measures of the same phenomenon" (Yin, 2003). As a replacement for the word triangulation, interpretive researchers should prefer, and feel more comfortable with, the term corroboration, which denotes "the act of strengthening [an argument] by additional evidence" Hayward and Sparkes, 1975). An interpretive researcher is strongly advocated to maintain the chain of evidence, which is essential for achieving a persuasive account in theory building studies (Eisenhardt and Graebner, 2007). In case participants reviewing the report disagreed with the researcher's conclusions, they ideally should not dispute the factual account presented by the researcher (Yin, 2003).

Furthermore, considering on the previous argument of operational measures, even in the situation where all the participants agree with the researcher's conclusions, it doesn't mean that construct validity had been achieved. Instead of construct validity as is defined by the case study design (Yin, 2003), "theoretical sufficiency" should allow interpretive researchers to build up and work upon constructs which emerge from the problem under investigation (Dey, 1999). Researchers should also adopt the notion of "theoretical sufficiency" instead of "theoretical saturation" (Glaser and Strauss, 1967).

While both indicate that the data have been properly analyzed, the latter turns out to be   an inflexible expression because it "has connotations of completion [and] seems to imply that the process of generating categories (including their properties and relations) has been exhaustive" (Dey, 1999).

Credibility

One of the key criteria addressed by positivist researchers is that of internal validity, in which they seek to ensure that their study measures or tests what is actually intended. According to Merriam, the qualitative investigator's equivalent concept, i.e. credibility, deals with the question, "How congruent are the findings with reality?" There will be some answers for that question but the strongest argument stated that ensuring credibility is one of most important factors in establishing trustworthiness (Guba and Lincoln, 1994).

Pattern-matching, by which the researcher compares an observed pattern against a predicted one, is regarded as a valuable tactic for case study analysis, while explanation building is considered as a special type of pattern matching (Yin, 2003). However, as was explained earlier, in an attempt to achieve internal validity according to the precepts of the case study design, interpretive researchers may downgrade the essence of theory building. Once again, theory-building studies can produce conclusive theories and are useful not simply for the generation of hypotheses. In addition, looking for rival explanations, other than the posed theoretical propositions, is a principle that is not exclusive for positivist researchers during the study.

Searching alternative reasons for the occurrence of a phenomenon is a task that adds rigor to the piece of research. This is particularly true for interpretive researchers, who must keep an open mind when looking for any cause-effect relationship that can offer a plausible explanation of the phenomenon under study. This exercise adds to the credibility of the analysis and findings (Guba and Lincoln, 1994). The coding procedure assists interpretive researchers in establishing the causal relationships that ultimately produce theory.

Transferability

External validity "is concerned with the extent to which the findings of one study can be applied to other situations". In positivist work, external validity refers to the extent that the findings from a particular study are able to be generalized and the concern often lies in demonstrating that the results of the work at hand can be applied to a wider population. However, the term should not be restricted to a statistical definition based on generalizations to the population from the sample. Since the findings of a qualitative project are specific to a small number of particular environments and individuals, it is impossible to demonstrate that the findings and conclusions are applicable to other situations and populations.

Generalizing implies going "from particular instances to general notions" (Lee and Baskerville, 2003), and interpretive researchers should include the temporal and spatial dimensions of the phenomenon under study in their analysis in order to produce theoretical generalizations (Walsham, 1995). These dimensions can yield important explanations of past data in particular contexts that could be useful to other settings in the future. Interpretive researchers may or may not agree with the suggestion to test the emergent theory from one case to a second one and so on under the "replication logic" (Yin, 2003). This approach returns the research to a hypothesis-testing exercise, and although a correct approach is from a positivistic perspective, it diverts the interpretive researchers intending to develope theory away from their main objective. Either from one case or from multiple cases, they intend to produce theoretical generalizations instead of testing theory.

Dependability

Using a case study protocol and developing a case study database assists researchers in organizing data during the research process (Yin, 2003). However, from an interpretive approach, the purpose in doing so is not to guarantee that a second researcher will arrive at exactly the same conclusions as the first one might have. The interpretive paradigm is based on the concept of empathetic or appreciative understanding that can be attained "when, through sympathetic participation, we can adequately grasp the emotional context in which the action took place" (Weber, 1978). Researchers are seen to be part of the research process as they seek to uncover meanings and understandings of the broad interrelationships in the situation they are researching by relying on the people being studied to provide their own explanation of their situation or behavior. The interpretive paradigm therefore takes the

view that the world is socially constructed and subjective, and that there is no reality outside of people's perceptions (Ticehurst and Veal, 1999).

These arguments imply that, the next researcher that use the same data and give a different interpretation based on her/his own beliefs and abilities to grasp the essence of the emotional context, he/she might present a completely different picture or discover a different angle to the same problem. Presenting the chain of evidence contributes to the trustworthiness of the analysis. Indeed, reliability for qualitative research "means producing results that can be trusted and establishing findings that are meaningful and in-

teresting to the reader" (Trauth, 1997) instead of showing consistent results by repeated analyses.

THE APPLICATION OF THE CASE STUDY

The focus of the research objectives was to explore the pattern of IT infrastructures, and how it might be playing the role as an enable of strategic alignment. And as an exemplification on how case study design for developing theory, can be adopted and adapted, a doctoral research will be forwarded as an example.

Activities:	Description:
TABLE 3 **THE CASE STUDY PROTOCOL**	
Context	Information Systems
Research Question	The guiding research question is, "How do firms achieve and maintain strategic alignment in a dynamic environment?". This study also provided insight into the following questions that are more specific than the overall research question. "How do characteristic of infrastructure IT flexibility (connectivity, compatibility, and modularity) play the role in achieving firm's strategic alignment" and "How do knowledge and skills of IT staff play the role in achieving firm's strategic alignment?"
Boundary of the study	The role of information technology infrastructures flexibility in achieving and maintaining sustainable strategic alignment
Unit of analysis	Strategic alignment
The cases	Four major companies in Indonesia participating in this study, one public and three state own companies. The selection of cases based on the stated reports and the level of strategic alignment between information technology and business strategies.
Literal replication concern	(1) Willing to be accessed by strategic-alignment tools set, and (2) Developed and implementing information technology master plan as an output of information systems strategic planning activity
Data collection strategies	Data collection was conducted in the mode of triangulation source of data, categorized as primary and secondary source of data. The primary data includes: focused in-depth interviews, field notes, firm's artifacts, direct observation, and artifact examination; while the secondary sources of data entailed archives, documents, manuals, systems, as well as published information material.
Data analysis and chain of evidence	For analyzing and chaining the evidence from the findings, intentional analysis was adopted by conducting the Lacity's steps (Lacity and Janson, 1994).:
Interpretation of findings	Insights are validated with rich descriptions, direct quotes from participants, and peer review of the interpretation (Lacity & Hirschheim, 1993) in order to build the thick description (Geertz, 1973) sought under this analytical ethos.

Components of Research Design

The case study design is the logical sequence that connects the empirical data to a study's initial research questions, and ultimately to its conclusion (Yin, 2003). Within the context of Information Systems, the research question for this study is , "How do firms achieve and maintain strategic alignment in a dynamic environment?". This study also provided insight into the following questions that are more specific than the overall research question. "How do characteristic of infrastructure IT flexibility (connectivity, compatibility, and modularity) play the role in achieving firm's strategic alignment" and "How do knowledge and skills of IT staff play the role in achieving firm's strategic alignment?" For the purpose of analysis, this study define alignment between IT strategies and business strategy as unit analysis (holistic unit analysis).

This research was not testing any hypothesis, proposition, or theoretical framework. The goal of this multiple-case study design, is an in-depth understanding and exploratory of the research problem (Miles and Huberman, 1994) of how firms achieve strategic alignment. This study employed four major companies in Indonesia in the area of electricity and power plant, energy, and telecommunication as case studies. The strongest suggestion stated that the holistic multiple-case study design implied that this research adopted the literal replication for predicting similar results (Yin, 2003). Literal replication concern the following criteria: willing to be accessed by strategic-alignment tools set, and having developed and implementing information technology master plan as an output of information systems strategic planning activity. To be included to the case study design is a single, in-depth pilot case study followed by cross-case analysis of another three firms.

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For analyzing and chaining the evidence from the findings, intentional analysis was adopted by conducting the Lacity's steps (Lacity and Jansen, 1994). Analysis consisted of creating tables to help identify patterns and themes from the information collected. By categorizing the data, the researcher was able to make connections and gain understanding into the respondents perceptions and preferences (Creswell, 1998). This method is particularly appropriate for analyzing data collected in interviews.

Interpretation of the findings or insights are validated with rich descriptions, direct quotes from participants, and peer review of the interpretation (Lacity and Jansen, 1994) in order to build the thick description sought under this analytical ethos.

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Interpretation of the findings or insights are validated with rich descriptions, direct quotes from participants, and peer review of the interpretation (Lacity and Jansen, 1994) in order to build the thick description sought under this analytical ethos.

Corroboration of the result

The most important point for methodological rigor in case studies, is the use of multiple sources of evidence Creswell (1998). Any findings from a case study will be more credible if it has been based on different sources of information, following a "corroborative" model (Yin, 2003). In methodological writing, the term qualitative data is generally taken to encompass the "rough materials researchers collect from the world they are studying", including field notes, documents, transcriptions of interviews and interactions, and artifacts (Bogdan and Biklen, 2006). Data are produced from social interactions and are therefore constructions or interpretations. There are no "pure," "raw" data, uncontaminated by human thought and action, and the significance of data depends on how material fits into the architecture of corroborating data. "Data analysis leads to reconstruction of those constructions" (Lincoln and Guba, 1985). In other words, qualitative data and information are always already interpretations made by participants as they answer questions or by researchers as they write up their observations. Neither research participants nor researchers can be neutral, because, as emphasized earlier, they are always positioned culturally, historically, and theoretically (Bogdan and Biklen, 2006).

This research adopted both primary and secondary sources of data. Focused in-depth interviews, field notes, firm's artifacts, and observation are among the primary sources of data, while the secondary sources of data entailed archives, documents, manuals, systems, as well as published information material. According to Yin (2003), the focused in in-depth interviews assisted the research in uncovering understandings, meanings, stories and experiences, and feelings and motivations around the problem.

Theoretical Coding and Theoretical Generalization

The case study research encompasses an acknowledgment of the researchers' bias, the selection of a data collection site, the data collection process, the process of coding and analysis, and the compilation of results. Coding and analysis includes three stages: open coding, selective coding, and theoretical coding. Open coding employs constant comparison and and results in themes, sub-categories, and core categories. These results guide the subsequent sampling of participants through theoretical sampling. The next stage of coding – selective coding – also employs constant comparison and memo creation. This stage results in dense, saturated core categories.

Ultimately, theoretical coding includes activities of sorting, writing, theorizing, and cross-referencing with literature. As mentioned previously, inductive approaches are intended to aid an understanding of meaning in complex data through the development of summary themes or categories from the raw data ("data reduction"). This inductive analysis for qualitative data considered to be done at the point when the theoretical sufficiency has been attained. This results will led to theoretical generalizations, and, it can be inferred that the end result of the research is not just to code the collected data, but theory development.

After Gregor (2006), the aims of this research are to produce a theory for analyzing "the how is" as well as a theory for explaining "the why is", the firm achieved strategic alignment and the role of information technology infrastructures in contributing the achievement of the strategic alignment. This paper is focused on the methodology adopted in conducting the research, as well as the considerations behind the decision to be taken. This paper demonstrated how to develop a theory by adopting an interpretive case study approach as a research design. It is also described the advantages and limitations of case study design for interpretive researchers in developing theory.

The case study is adopted for defining the initial steps of the research. The analysis was done by intentional analysis, whereas the quality of the findings was achieved from the interpretive stance. Theory was produced by following the

guidelines provided by earlier works of authors in order to analyze the data nor producing a theory that widely published (Yin, 2003; Eisenhardt, 1989]. Intentional analysis has been embedded to a case study and been used to build a chain of evidence. There is a limitation concerning the nature of intentional analysis. The very quality that lends intentional analysis to interview data analysis, the common contextual factors between the subjects and researcher, introduces some degree of bias. This paper is not intended to cover the overall findings, and for such details interested readers may refer to the author.

CONCLUSIONS

This paper demonstrated how to develop a theory by adopting an interpretive case study approach as a research design. It is also described the advantages and limitations of case study design for interpretive researchers in developing theory. The case study is adopted for defining the initial steps of the research.

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REFERENCES

Andrade, A. D. (2009). Interpretive Research Aiming at Theory Building: Adopting and Adapting the Case Study Design. The Qualitative Report, 14(1), pp. 42-60.=]=;;;\

Baroudi, J. J., Olson, M. H., and Ives, B. (1986). An Empirical Study of the Impact of User Involvement on System Usage and Information Satisfaction. Communications of the ACM, 29 (3), pp. 232-238.

Benbasat, I., Goldstein, D. K., and Mead, M. (1987). The case research strategy in studies of information systems. Management Information Systems Quarterly, 11(3), pp. 369-388.

Bogdan, R., & Biklen, S. (2006). Introduction to Qualitative Re-search in Education (5th ed.). Boston: Allyn & Bacon.

Cecez-Kecmanovic, D. (2001), Doing critical IS research: the question of methodology, in Trauth, E. (Ed.), Qualitative Research in Information Systems: Issues and Trends, Idea Group Publishing, Hershey, PA, pp. 142-63.

Chua, W. F. (1986). Radical developments in accounting thought, The Accounting Review, 61, pp. 601–632.

Creswell, J. W. (1998). Qualitative Inquiry and research design: Choosing among five traditions. Thousand Oaks, CA: Sage.

Darke, P, Shanks, G and Broadbent, M. (1998). Successfully Completing Case Study Research: Combining Rigour, Relevance and Pragmatism, Information Systems Journal, 8, pp. 273-289.

Dey, I. (1999). Grounding grounded theory: Guidelines for qualitative inquiry. San Diego, CA: Academic Press.

Eisenhardt, K. M. (1989). Building theories from case study research. Academy of Management Review, 14(4), pp. 532-550.

Eisenhardt, K. M., and Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. Academy of Management Journal, 50(1), pp. 25-32.

Garcia, L., and Quek, F. (1997). Qualitative research in information systems: Time to be subjective? Paper presented at the Proceedings of the IFIP TC8 WG 8.2 International Conference on Information Systems and Qualitative Research, Philadelphia, PA.

Glaser, B. G., and Strauss, A. L. (1967). The discovery of grounded theory: Strategies for qualitative research. Chicago: Aldine.

Gregor, S. (2006). The nature of theory in information systems. Management Information Systems Quarterly, 30(3), pp. 611-642.

Guba, E. G., and Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In N. K. Denzin and Y. S. Lincoln (Eds.), Handbook of qualitative research (pp. 105-117). Thousand Oaks, CA: Sage.

Hayward, A. L., and Sparkes, J. J. (Eds.). (1975). Cassell's English dictionary (4th ed.), London: Cassell and Collier Macmillan.

Klein, H. K., and Myers, M. D. (1999). A set of principles for conducting and evaluating interpretive field studies in information systems. Management Information Systems Quarterly, 23(1),pp. 67-88.

Lacity, M., and Jansen, M. A. (1994). Understanding qualitative data: A framework of text analysis methods. Journal of Management Information Systems, 11, pp. 137-166.

Lee, A. S., and Baskerville, R. L. (2003). Generalizing generalizability in information systems research. Information Systems Research, 14(3), pp. 221-243.

Lincoln, Y. S., & Guba, E. G. (1985). Naturalistic inquiry. Newbury Park, CA: Sage.

Marshall M. N. (1996). Sampling for qualitative research, Family practice, 13, pp. 522-525.

Mason, J., (1996). Qualitative researching. Thousand Oaks. CA: Sage.

Merriam, S. B. (1998). Qualitative Research and Case Study Applications in Education, San Francisco, Jossey-Bass.

Miles, M. B., and Huberman, A. M. (1994). Qualitative data analysis: An expanded sourcebook (2nd ed.). Thousand Oaks, CA: Sage.

Mingers, J. (2001). Combining IS Research Methods: Towards a Pluralist Methodology. Information Systems Research, 12(3), pp. 240-259

Newman, M. (1997). Epicene pronouns: the linguistics of a prescriptive problem. New York: Garland.

Orlikowski, W. J., and Baroudi, J. J. (1991). Studying information technology in organizations: Research approaches and assumptions. Information Systems Research, 2(1), pp. 1-28.

Patton, M.Q. (1990). Qualitative Evaluation and Research Methods, Newbury Park, CA: Sage.

Schwandt, T. A. (1994). Constructivist, interpretivist approaches to human inquiry. In N. K. Denzin and Y. S. Lincoln (Eds.), Handbook of qualitative research (pp. 118-137). Thousand Oaks, CA: Sage.

Siggelkow, N. (2007). Persuasion with case studies. Academy of Management Journal, 50(1), pp. 20-24.

Strauss, A. L.,and Corbin, J. M. (1990). Basics of qualitative research: Grounded theory procedures and techniques. Newbury Park, CA: Sage.

Ticehurst,G.W., and Veal, A.J.(1999). Business Research Methods: A Managerial Approach, Addison Wesley, South Melbourne.

Trauth, E. M. (1997). Achieving the research goal with qualitative methods: Lessons learned along the way. Paper presented at the Proceedings of the IFIP TC8 WG 8.2 International Conference on Information Systems and Qualitative Research, Philadelphia, PA.

Urquhart, C. (2007). The evolving nature of grounded theory method: The case of information systems discipline. In A. Bryant and K. Charmaz (Eds.), The Sage handbook of grounded theory (pp. 311-331). London: Sage.

Urquhart, C., and Fernández, W. (2006). Grounded theory method: The researcher as blank slate and other myths. Paper presented at the International Conference on Information Systems, Milwaukee, WI.

Walsham, G. (1995). Interpretive case studies in IS research: Nature and method. European Journal of Information Systems, 4(2), 74-81.

Weber, M. (1978). Economy and Society: An Outline of Interpretive Sociology, University of California Press, Berkeley.

Yin, R. K. (2003). Case study research: Design and methods (3rd ed., Vol. 5). Thousand Oaks, CA: Sage.

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Policy Planning with the Delphi Method:
A Healthcare HRM Case Study

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ABSTRACT

The Delphi Method offers business and government professionals a systematic methodology for policy planning. This paper offers a comprehensive explanation of the Delphi Method and its application in a human resource management (HRM) application in the health sector. The Delphi Method is introduced and the process for conducting a Delphi study in a policy-planning context is described. Most significantly, this process is illustrated by an application of the Delphi Method to develop a health workforce classification framework for employment relations and funding. The paper concludes with eleven recommendations for conducting a Delphi Method study for policy planning and development.

INTRODUCTION

Human resource management (HRM) in the health sector is an important and difficult occupation. In no other industry are several groups of highly skilled professionals working together as a team in an endeavor so important as the care of human life. The health workforces that are the focus of this study—doctors, nurses, midwifes, and allied and primary health professionals—are also highly paid professionals in a large and costly industry.

A critical aspect of healthcare HRM is policy planning for employment relations, individual and collective bargaining, and funding allocation. Too often this planning is done on an ad hoc basis and without a comprehensive framework to guide policy development. What alternatives are there to policy development under pressure and in a top-down manner, usually in a cost-constraining environment?

As described in this paper, the Delphi Method is a structured and iterative process designed to reach a consensus on a policy question of interest, utilizing the informed opinions of a group of experts. The Delphi Method offers all business and government professionals a methodology for reasoned and informed policy planning.

The principal purpose of this paper is to offer a comprehensive explanation of the Delphi Method and illustrate its application in the development of a health workforce classification framework for employment relations and funding. All professionals in a policy-planning role will benefit by seeing how the Delphi Method can be used for policy development. The second purpose is to provide healthcare HRM professionals with a validated framework for setting health workforce priorities, a framework that can be adapted to their institutional or governmental situations.

THE DELPHI METHOD

The original purpose of the Delphi Method was to forecast the future. Specifically, the RAND Corporation developed the Delphi Method in the 1950s for use by the United States military. Forecasting methods available at the time were mostly unreliable (e.g., an expert's judgment) or

depended on data that were unavailable (e.g., trend extrapolation). The first applications of the Delphi Method included forecasting studies such as bombing requirements in case of a nuclear war (Dalkey & Helmer, 1963). The name "Delphi" is a reference to the ancient Greek village of Delphi, location of the Temple of Apollo in which the oracle Pytha resided.

An analysis of Delphi studies from 1975 to 1994 (Gupta & Clarke, 1996) identified 179 published papers that utilized the Delphi Method, and most of the early studies involved some aspect of forecasting. Twenty-seven papers were in health care (e.g., Bijl, 1992) and three were human resource applications of the Delphi Method (e.g., Couger, 1988; Koch & Fortner, 1983).

In 1970 Murray Turoff introduced the concept of the policy Delphi "to offer some suggestions and ideas to anyone interested in designing, utilizing, or participating in a Delphi devoted to examining policy issues" (Turoff, 1970, p. 149). Unlike the forecasting Delphi, policy applications of the Delphi Method tend to utilize informed advocates, not experts. Similarly, in policy-developing applications of the Delphi Method, an airing of views is considered more important than reaching a consensus (Turoff, 2002). Discussion of various methodological issues and applications of the Delphi Method in social policy and public health are available in Adler and Ziglio (1996).

A concise description of the Delphi Method follows, but many of the key points for implementing the Delphi Method in a policy planning process are illustrated in the case study that forms the bulk of this paper.

THE POLICY DELPHI METHOD PROCESS

Every application of the Delphi Method begins with a question or a problem. The principal investigator defines the problem as best he/she is able to and conducts some initial research to formulate the key issues involved (Turoff, 2002). Initial research is important because it gives some focus to round one.

Next, a panel of experts or advocates is assembled. There is no prescribed maximum or minimum number of panelists required, it will depend on the nature of the study. For various reasons, in a policy Delphi study smaller is better, usually between 10-50 and frequently approximately 20 panelists (Turoff, 2002). These reasons include:

- The opinions of a few highly valued experts would almost certainly produce the same or better results than soliciting the opinions of everyone who could be involved.

- Agreement to participate in the study by a few highly committed individuals will reduce panel drop out throughout the study (Judd, 1972).

- The process of compiling the results by the investigator and reviewing feedback by the panelists can be onerous with a large panel.

- The panel should represent a balance of perspectives, but this is not a debate so deliberately loading the panel with opposing sides will make consensus difficult or impossible, even after multiple rounds.

Then the Delphi Method process formally begins:

- In round one, the panel is provided with the question or problem and the initial research. Generally the purpose of this round is to ensure a clear understanding of the problem and that the initial research is complete. This is usually achieved by the use of a questionnaire featuring open-ended questions such as "Is this list complete? If not, what is missing?".

- The investigator compiles the results from round one in a format that allows all panelists to see the comments of all other panelists and this is sent to the panel in round two.

- In round two, the focus tends to shift to priority setting in order to identify areas of agreement and disagreement in the panel. Typically, the panel is asked to rate or rank the options put to them and,

critically, to comment on and justify their ratings or rankings.

- The investigator compiles the results from round two, typically using measures of central tendency such as the mean, median, and/or mode. Depending on the statistical knowledge of the panelists, measures of dispersion such as standard deviation and inter-quartile range can be used (Hasson, Kenney, & McKenna, 2000).

- The principal purpose of round three is to determine if a consensus can be reached. An effective way to do this is to remind each panelist of their rating or ranking of each item in round two, in comparison to a group mean or median. Each panelist is also asked to consider the comments from round two. Then each panelist decides a new score for each item, either the same as in round two, or a new one based on the input from round two.

- If there is a lack of consensus or new issues and dissenting opinions arise in round three, a fourth round may be necessary.

- The final task of the investigator is to compile the results into a policy document that accurately records the collective judgment of the panel.

This process shows the iterative nature of the Delphi Method as the judgments of experts or advocates are collected, aggregated, and distributed in controlled feedback in a consensus-seeking process.

An important aspect of this process is the anonymity of the panelists. At all times, the identity of each panelist is not known to other panelists, only to the investigator. The key reason for this is to enable impartial opinion to emerge. If high status individuals are included in the panel and their vote or opinion is revealed to others, then there may be some movement of the panel to that position. In highly contentious circumstances, there could be social pressure or lobbying from some individuals to other panelists. Although panelists may know each other personally or by reputation, their identities are not revealed any-

time in the process and any comments that may reveal their identity are adjusted by the investigator to preserve anonymity of the panelists.

APPLICATION OF THE DELPHI METHOD TO DEVELOP A HEALTH WORKFORCE CLASSIFICATION FRAMEWORK

Like other healthcare industries around the world, the New Zealand health sector faces challenges in employment relations (i.e., relationships in the workplace environment), industrial relations (i.e., individual and collective bargaining), and funding allocation. In 2011 a policy planning study was undertaken to address these issues (Aileone, 2011). The highly condensed summary of this research-based study in this section provides the case study to illustrate the application of the Delphi Method, as described in the previous section.

Formulation of the Study and Key Issues

The motivation for the study originated because one of the authors has worked for the New Zealand health sector in HRM consulting with a special interest in labor relations. Seeking a more methodical way to establish priorities within the health sector, the Delphi Method was suggested as a suitable method to develop a framework that could be used for employment relations (ER), industrial relations (IR), and funding allocation.

To frame the context of the study, the research question framework in Cooper and Schlinder (2008) was used to identify the key questions to undertake in the study (see Table 1).

A literature review identified the need to develop more appropriate frameworks for health workforce monitoring and development (Conway, McMillan, & Becker, 2006) as well as proposed frameworks in health care (e.g., Bloor & Maynard, 2001; Conway, et al., 2006; Hughes, 2003) and other fields (e.g., Mackay, 1999; Segerholm, 2003).

More significantly, a number of studies in the New Zealand health sector (e.g., Duckett, 2005; Hadorn, 2010; Horn, 2009; HWAC, 2002) suggested some elements that could be used to build a classification framework suitable for the

TABLE 1	
RESEARCH QUESTION HIERARCHY FOR HEALTH CLASSIFICATION FRAMEWORK	
Management Dilemma	Why does the New Zealand health sector not have better information when making decisions on workforce priorities when entering into employment and industrial relations negotiations with health professionals?
Management Question	How can the New Zealand health sector improve the current processes for gathering information about health workforces, within the ER and IR contexts?
Research Question	Could the health sector use a health workforce classification for employment relations and funding? Is this a plausible course of action and should this be considered?
Investigative Questions	*What criteria could be used to better inform this process?* Based on international best practice, this research determines what criteria for funding prioritization works best within the New Zealand context. This was identified in the first round and confirmed in the second and third rounds of the Delphi Method. *What criteria do other countries use as "best practice" when allocating funding prioritization for health workforces?* Criteria for specification of a funding framework was identified in the literature and presented to the panel of health workforce experts in the first round of the Delphi Method. The draft framework was tested in association with these identified criteria.

New Zealand situation. Additional elements and justifications were provided by interviews with a few key staff in the health sector.

From the literature and interviews, five elements were identified for inclusion in the initial framework. In alphabetical order these elements are: operational capacity, operational flexibility, public profile, service need, and supply factors. For each element various sub-elements were identified (e.g., in supply factors: community/population health requirements, distribution of the work force).

These proposed elements and sub-elements were written up in a background paper provided to the panelists in round one.

Selection of the Panel

Delbecq, Van de Ven, and Gustafson (1975) recommend "top management decision makers who will utilize the outcome of the Delphi study" and "professional staff members" (p. 85) as target groups for inclusion on a Delphi panel in the program planning area. This approach was adapted for this study.

Specifically, the final Delphi panel was composed of 15 participants. The participants were all employees in New Zealand district health boards (DHBs) and were all engaged in senior or executive leadership roles. The panelists represent a good distribution by geography (e.g., North Island versus South Island; urban versus rural DHB), position (e.g., CEO, CFO, HR manager, professional consultant) and organization (e.g., small, medium-sized, and large DHB). Most panelists have been involved in collective agreement bargaining in the health sector.

Note that the panel did not include stakeholders from central government, for funding, or unions, for labor negotiations. Consistent with advice offered in the previous section, this position was taken to ensure a consensus could be reached on a framework suitable for the district health boards, who are at the front line of employment relations, industrial relations, and funding allocation within the health sector. This was not a forum for debate or labor negotiations, but a consensus building process. The final report recommended that once a classification framework that represented the DHB

viewpoint was in place, then the next step is "the establishment of a tripartite working group of representatives of, for example, employers, unions and central government to achieve a common view of pressure points and priorities" (Aileone, 2011, p. 39).

Invitations to all panelists included a timetable for all three rounds of the study and a realistic estimate of the work required. Several invitees declined to participate because of scheduling conflicts (e.g., being overseas or on annual leave during one or more rounds) or simply being too busy to give the time expected.

This is a key point: Investigators should always be honest and realistic with panelists about time commitments to read, respond, and comment, which can be quite onerous, especially in round one. The alternative—to minimize or not mention time commitment—can lead to less-than-fully committed individuals and panel drop out. In this study, all 15 panelists responded to all three rounds, panel drop out was zero.

Delphi Method Rounds One to Three

Any serious data collection effort should be preceded by a pilot study to test the data collection instruments and process. Accordingly, three individuals who were eligible to sit on the panel, but who were not panelists, were asked to read the background paper and complete the proposed questionnaire for round one. Small adjustments were made in the questionnaire to remove ambiguity identified in the pilot study.

Round one included the background paper written from the literature review and a structured questionnaire with ten open-ended questions about the elements or the framework (e.g., If you could add an additional key factor, what would it be? How would it be described?). Panelists were also strongly encouraged to "please provide a brief comment or explanation of your response. These comments are critical to inform other panel members about your answer and to reach a consensus in subsequent rounds."

In round two each participant was provided with feedback from round one and asked to consider their position in light of this feedback. They were then able to look at the collec-

tive feedback and decide whether they wanted to change their stated position about inclusion of the original elements/sub-elements, new elements/sub-elements, descriptions, etc. A scoring matrix also allowed ranking of the elements in the framework.

In the third and final round, each participant received the framework and the summarized feedback from round two. This round allowed participants to make any further changes or explanations of previous information. No substantial comments for change were offered, and so a consensus was reached.

Delphi Method Results

The combination of data, feedback, and consensus from the three rounds allowed the draft framework for workforce prioritization to be modified to ensure it is as close as possible to a consensus of participants' agreed opinion. The final workforce classification framework derived from three rounds of the Delphi Method as described in this section is summarized in Table 2. The framework can be used to set priorities in ER, IR, and funding. For example, funding proposals that address service need in the health sector should get a higher priority than those that support public profile.

RECOMMENDATIONS FOR POLICY PLANNING USING THE DELPHI METHOD

The classification framework in Table 2 will be of interest to human resource managers in the health sector, either in an institutional (e.g., hospital) or governmental (e.g., funding agency, governance) role. This fulfills the secondary purpose of this study.

The principal purpose is to offer a comprehensive explanation of the Delphi Method and to illustrate its application in the process of developing this framework. The process was described in the third section of this paper and illustrated in the case study. To conclude, we offer some recommendations for business and government professionals considering adapting the Delphi Method for a policy-planning project.

TABLE 2
CLASSIFICATION FRAMEWORK FOR HEALTH WORKFORCE PRIORITIZATION

Service Need

- Service stability: are there expected changes to current service demand (population/purchasing drivers)?

- Operational deployment and intensity of occupational utilization: for example, is 7 day/24 hour service required?

- Clinical processes/model of care influence on occupational requirements: for example, are clinical processes nurse/doctor led?

Public Profile

- Public confidence: does the lack of a readily available workforce pose potential public confidence issues if the service cannot be delivered as required?

- Political/Policy context: what political mandate/drivers exist for particular workforces?

- Labor market positioning: relative strength in the labor market.

Supply Factors

- Community/population health requirements: are there sufficient numbers of this occupational grouping within the system (via education and immigration)?

- Distribution: is there a general distribution issue or a specific local/regional misdistribution?

- Gender/ethnicity/age: is an aging workforce an additional risk factor? Are there ethnicity or gender issues?

Operational Flexibility

- Regulatory influences impact under Health Practitioners Competence Assurance Act (HPCAA) 2003: statutory impacts on workforce availability.

- Custom and practice: are the current barriers/ways of working, custom, and practice as opposed to actual legislative barriers?

- Size of occupational grouping: small numbers tend to be an additional risk factor.

- Scope of practice: how enabling/limiting is the current scope in terms of flexibility?

- Ability to substitute: can workforce elements be readily or easily substituted if required? If not, does this pose an additional risk?

- Qualifications/Education pathways: timeframes for gaining competent practitioners (longer/postgrad qualifications are an additional risk as longer lead in).

Operational Capacity

- Lead in time for recruitment: either internal supply or ability to recruit internationally (particularly if majority of source is gained internationally).

- Recruitment and retention: including public/private drag on supply.

- Specificity of skills/competency required: how specialized are the skills required to perform the role?

- Suitably skilled workforce specific service/clinical process: does the current workforce have all the skills required?

- Additional regulations: how do these regulations impact on healthcare professionals ability to practice

- Begin by becoming familiar with the Delphi Method. An excellent online source is *The Delphi Method: Techniques and Applications* (Linstone & Turoff, 2002). Chapter III.B.1 (Turoff, 2002) of this book describes, at a general level, the use of the Delphi Method for policy development. A more practical introduction to the use of the Delphi Method for decision making in social policy planning is offered by Ziglio (1996).

- Aim for diversity of viewpoints in selecting panel members; avoid creating coalitions of opposing viewpoints. As noted earlier, the goal of the Delphi study is to create a consensus on a question or problem of public policy, not a debate.

- When determining panel size, less is more. Delphi panels of 50, 100, and even over 1,000 are described in the literature (e.g., Judd, 1972), although these usually are simple quantitative surveys conducted in an iterative manner with little or no control over panel membership and participation. A policy Delphi will require fewer individuals. In most cases using over 20 individuals will result in dimensioning returns for each new panelist and will almost certainly overload the investigator and panelists with unnecessary work.

- The best panelist is a committed panelist. Panelists are sometimes invited solely for their expertise and the amount of work involved is minimized or not mentioned. This is a mistake because when the materials for round one arrive these busy individuals are likely to set the work aside and never deliver on their acceptance of the invitation. The invitation to be a panelist should contain a realistic schedule, a clear statement of time commitments, and a requirement for a reply that commits the individual to the project.

- A realistic schedule includes sufficient time for the panelists to complete at least three rounds of surveys—each including reading, responding, and commenting—and for the investigator to complete compilation of results and return feedback to the panelists in a timely matter. The Delphi study described in this study took almost three months (March

22—June 3, 2011) for all three rounds. Yet, the final report concluded "In hindsight, the use of three rounds coupled with the very senior roles that the participants held, meant that further time should have been allowed for this process." (Aileone, 2011, p. 37)

- In the invitation, promise to provide panelists a copy of the results, and do so. This can be offered as a benefit that ensures a commitment to the task.

- Conduct initial research and present it to the panel in round one. Brainstorming works well in a face-to-face environment, but not so well when participants are isolated and unsure of what to suggest. The Delphi Method begins best when the panelists have a document or proposal to react to, and a structured questionnaire of open-ended questions to answer in round one.

- Do a pilot study. The investigator is almost certainly very close to the subject and so ambiguous terms or unclear questions are likely to appear in the panelists' materials. All data collection worth doing is worth a pilot study.

- Use Internet facilities, but wisely. The days of sending and receiving Delphi round materials by postal mail are history. Today, most panelists receive instructions and questionnaires as attachments to email messages and return their responses in the same manner. Offering the feedback and questionnaires in an online survey format is possible, but will tend to limit opportunities for deep thinking and considered responses. In online surveys, rating and ranking is easy, but commenting is more time consuming and difficult, which limits feedback to fellow panelists. Other online tools, such as online discussion boards in which panelists can view each other's contribution in real time, obviously contaminate the independence of each response and so should not be used.

- Panelists must be given every opportunity to comment and be strongly encouraged to do so. In rounds two and three, the key input to the panelist is the comments from fellow panelists. Instructions should require or strongly encourage comments and questionnaires must be designed with an

explicit opportunity to add comments. On the other hand, excessively verbose, off-the-topic or identity-revealing comments should be modified by the investigator.

- Recognize that the Delphi Method is never completely free from investigator bias. Inevitably, in the conduct and preparation of the initial research, in the selection of the panelists, and in the editing of the panelist comments, there are opportunities for bias. This can be minimized by reflective thinking, co-investigation by "at least two [investigators] so that one can check the other" (Turoff, 2002, p. 88), and external moderation. In the case study described in this paper, all materials sent to the panelists by the principal investigator were moderated by the co-author for objectively, fairness, and accuracy.

CONCLUSION

This paper offers business professionals and government officials in policy planning roles insight into how the Delphi Method can be used for policy development. Individuals not familiar with the Delphi Method will appreciate this introduction to this methodology and its application in a policy planning study. Individuals who may be familiar with the Delphi Method in a forecasting context will have gained an appreciation of its application in policy planning. All prospective Delphi Method users will benefit because several of the recommendations (e.g., select panelists for diversity of opinion, conduct a pilot study, how to ensure committed panelists) are made explicit or are new—not in the existing literature.

REFERENCES

Adler, M. & Ziglio, E. (1996). *Gazing into the oracle: The Delphi Method and its application to social policy and public health*. Bristol, PA: Jessica Kingsley Publishers, Ltd.

Aileone, L. C. (2011). *Use of a health workforce classification framework for employment relations and funding*. Unpublished MBA research report, Massey University, Auckland, New Zealand.

Bijl, R. (1992). Delphi in a future scenario study on mental health and mental health care. *Futures, 24*, 232-250.

Bloor, K. & Maynard, A. (2001). Workforce productivity and incentive structures in the UK National Health Service. *Journal of Health Services Research and Policy, 6*(2), 105-113.

Conway, J., McMillan, M., & Becker, J. (2006). Implementing workforce development in health care: A conceptual framework to guide and evaluate health service reform. *Human Resource Development International, 9*(1), 129-139.

Cooper, D. R. & Schindler, P. S. (2008). *Business research methods* (10th ed.). Boston, MA: McGraw-Hill.

Couger, J. (1988). Key human resource issues in IS in the 1990s: View of IS executives versus human resource executives. *Information & Management, 1*(4), 161-174.

Dalkey, N. & Helmer, O. (1963). An experimental application of the Delphi Method to the use of experts. *Management Science, 9*(3), 458-467.

Delbecq, A. L., Van de Ven, A. H., & Gustafson, D. H. (1975). *Group techniques for program planning*. Glenview, IL: Scott, Foresman and Co.

Duckett, S. J. (2005). Interventions to facilitate health workforce restructure. *Australia and New Zealand Health Policy, 2*(14).

Gupta, U. G. & Clarke, R. E. (1996). Theory and applications of the Delphi technique: A bibliography (1975-1994). *Technological Forecasting and Social Change, 53*, 185-211.

Hadorn, D. (2010). *Moving forward on healthcare prioritisation* (Department of Public Health Seminar). Wellington, NZ: University of Otago.

Hasson, F., Keeney, S., & McKenna, H. (2000). Research guidelines for the Delphi survey technique. *Journal of Advanced Nursing, 32*(4), 1008-1015.

Horn, M. (2009). Meeting the challenge: Enhancing sustainability and the patient and consumer experience within the current leg-

islative framework for health and disability services. In *New Zealand Report of the Ministerial Review Group*. Retrieved from http://www.hive.org.nz/sites/default/files/MRG_Report_Meeting_the_Challenge.pdf.

Hughes, R. (2003). A conceptual framework for intelligence-based public health nutrition workforce development. *Public Health Nutrition*, *6*(6), 599–605.

HWAC (Health Workforce Advisory Committee). (2002). *The New Zealand health workforce: A stocktake of issues and capacity 2001*. Wellington, NZ: Health Workforce Advisory Committee.

Judd, R. C. (1972). Use of Delphi Methods in higher education. *Technological Forecasting and Social Change*, *4*(2), 173-186.

Koch, E. & Fortner, C. (1983). Trends in training and OD. *CTM: The Human Element, 15*, 22-27.

Linstone, H. A. & Turoff, M. (2002). *The Delphi Method: Techniques and applications*. Retrieved from http://is.njit.edu/pubs/delphibook.

Mackay, K. (1999). *A diagnostic guide and action framework: Evaluation capacity development (*ECD Working Paper, Series No. 6). Washington, DC: World Bank.

Segerholm, C. (2003). Research evaluation in national (state) politics and administration: a critical approach. *American Journal of Evaluation*, *24*(3), 353-372.

Turoff, M. (1970). The design of a policy Delphi. *Technological Forecasting & Social Change*, *2*(2), 149-171.

Turoff, M. (2002). The policy Delphi (chapter III.B.1). In Linstone, H. A. & Turoff, M. (Eds.), *The Delphi Method: Techniques and applications*, (pp. 80-96). Retrieved from http://is.njit.edu/pubs/delphibook/ch3b1.pdf.

Ziglio, E. (1996). The Delphi Method and its contribution to decision-making. In Adler, M. & Ziglio, E. (Eds.), *Gazing into the oracle: the Delphi Method and its application to social policy and public health* (pp. 3-26). Bristol, PA: Jessica Kingsley Publishers, Ltd.

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An Empirical Analysis of the Theory of Reasoned Action on Understanding the Impact on Auditing Ethical Decisions

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ABSTRACT

Understanding the process of ethical decision making by accountants and auditors has increasing become more important than in past decades. This study will attempt to contribute to the small but growing body of literature concerning ethical decisions by auditors using the Theory of Reasoned Action (TORA), a popular psychology theory. The TORA is used in this study to attempt to understand the decision making process involving ethical dilemmas using auditing students as surrogates for entry level auditors.

The subjects in this study included 67 auditing students at the conclusion of an undergraduate auditing class. The study instrument consisted of 37 questions across three measures as hypothesized by the TORA. Two vignettes were used to measure ethical decision making with each vignette requiring two decisions.

Principle components analysis of the 37 scale responses yielded three identifiable dimensions regarding ethical decisions: 1) subject attitudes toward ethical behavior, 2) subjective norms toward the expected ethical behavior and 3) subject intentions toward ethical decisions.

The results of the study showed that across both vignettes, one component of the TORA (subjective norms) is significantly correlated (.283, sig .010) to intentions, but subject attitudes are not correlated to intentions (.104, sig .201). In all vignettes, intentions of the subjects and subjective norms are significantly correlated with the decisions, but subject attitudes are not.

These results seemed to indicate that students (entry level auditors) are influenced by what they perceive the auditing profession would find acceptable ethical behavior (subjective norms), even when their overall attitudes toward ethical behavior are not correlated with the vignette decisions. This partial confirmation of the TORA model appears consistent with results in much of the psychology literature.

INTRODUCTION

Understanding the process of ethical decision making by accountants and auditors has increasing become more important than in past decades, and consequently many university accounting programs increased the coverage of accounting ethics in their programs of study. This increased coverage of accounting ethics ranged from stand-alone ethics courses to increased ethics coverage across the accounting curriculum. However, understanding the process of ethical decision making has not received as much attention.

During the 1990s, the largest accounting firms expanded into global, multidisciplinary, professional services firms that *also happened to conduct audits*. In June 1996 Arthur Levit, then

SEC Chairman, said "I'm deeply concerned that '*independence*' and '*objectivity*' are increasingly regarded by some [in the accounting profession] as quaint notions....I caution the [accounting] industry, if I may borrow a Biblical phrase, not to 'gain the whole world, and lose [its] own soul'."

These same firms responsible for the financial reporting function were impacted from the fallout of recent financial-reporting scandals. "Reports on the collapse of Enron, the bankruptcy of WorldCom, and a growing list of failures and near failures have exposed massive manipulations of financial reporting by management, inexplicable breakdowns in the independent audit process, astonishing revelations of holes in our financial-reporting standards and practices, and stunning lapses of corporate governance" (Sutton, 2002). As Sutton also pointed out, "in this environment, investors and the public have become increasingly skeptical about a system that seems to be out of control."

Sutton points out we must confront some challenging questions in light of the failures mentioned above. These questions are:

Can we believe in and rely on the independent audit?

- Can we believe the accounting and disclosure standards provide the transparency essential to investors and the public?

- Can we rely on self-regulatory systems to ensure audit quality and to root out and discipline substandard performance?

- Can we rely on corporate governance processes—-oversight by boards of directors and audit committees—-to ride herd on management and to see to it that auditors do their jobs?

Sutton continued that events have changed how these questions are considered, and the change may last for decades to come. Most of these concerns are directly impacted by the process of analyzing and making ethical decisions during the conduct of an audit.

This study attempts to contribute to the body of literature concerning ethical decisions using the Theory of Reasoned Action, a popular psychol-ogy theory. The TORA is used in this study to attempt to understand the decision making process involving ethical dilemmas.

THE THEORY OF REASONED ACTION

The Theory of Reasoned Action (TORA) of Fishbein and Ajzen (1975) and Ajzen and Fishbein (1980) is based on the proposition that an individual's behavior is determined by the individual's *behavioral intentions* to perform that behavior, which provides the most accurate prediction of behavior. Behavioral intention is a function of two factors: the subject's *Attitude* toward the behavior and the subject's *Subjective Norms*. *Attitudes* toward the behavior is defined as "a person's general feeling of favorableness or un-favorableness for that behavior" (Ajzen and Fishbein, 1980). *Subjective Norms* are defined as a person's "perception that most people who are important to him (in this case the auditing profession) think he should or should not perform the behavior in question" (Ajzen and Fishbein, 1980). Variables that are external to the model are assumed to influence intentions only to the extent they affect either attitudes or subjective norms (Fishbein and Ajzen, 1975). Gibson and Frakes (1997) explained the TORA as a parsimonious model which assumes human beings are quite rational and make systematic use of the information available to them. The model viewed an individual's behavior as following logically from this information. The major goal of the theory is to understand and predict a person's behavior.

The solid lines in this model indicate the theoretical direct relationships between the model variables while the dotted lines indicate relationships outside the theoretical structure of the TORA model.

LITERATURE REVIEW

Theory of Reasoned Action

The TORA can be applied in situations in which an individual consciously considers a decision to engage in ethical behavior, such as using the guidance of a formal code of conduct or behaviors learned in a school, church etc. that

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FIGURE 1
BASIC TORA MODEL

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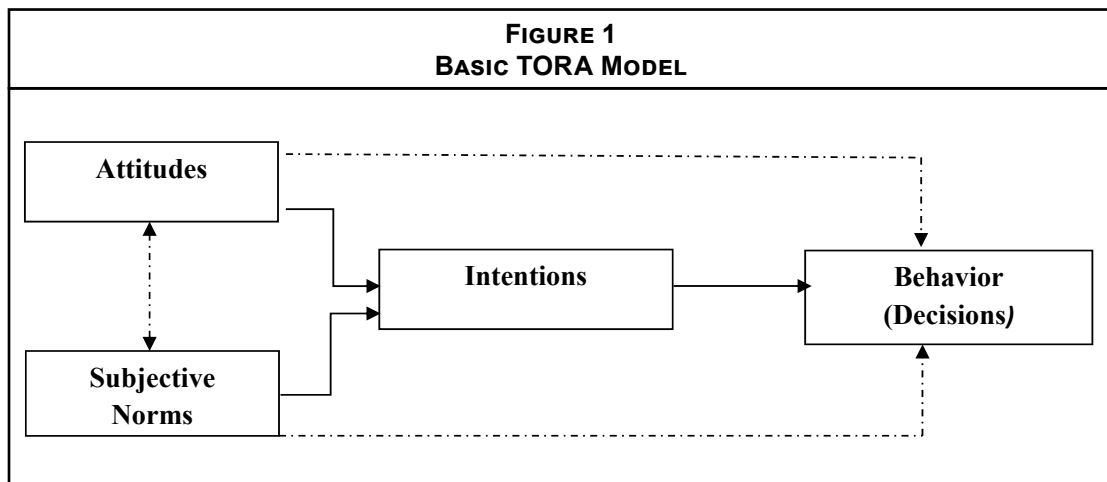
relates to making ethical business decisions, or in this case, auditing decisions. The social psychology literature shows a robust research history of support for the TORA, including the differentiation of subjective norms and attitudes as influences on behavioral intentions and the value of behavioral intentions as the link between attitude and behavior (Trafimow and Fishbein 1994, 1995; Sheppard et al. 1988). However, subjective norms and attitudes have sometimes been found to be correlated rather than independent as hypothesized in the TORA (Albrecht and Carpenter, 1976; Fredricks and Dossett 1983).

In a 1989 paper by Randall (1989) summarizing business ethics research which tests the theory of reasoned action she suggested directions for further research. The theory of reasoned action had been, at the date of the study, applied only once to the explanation of unethical conduct in organizations. Her review of empirical literature revealed very few of the linkages hypothesized by the theory of reasoned action have been explored. Only one of the hypothesized linkages, between external variables and beliefs about performing a behavior, has been extensively explored in ethics research.

Using a sample of 146 undergraduates, DeVries and Ajzen (1971) studied cheating in two colleges. They found highly significant correlations between attitudes toward cheating and cheating intentions, subjective norms and cheating intentions, as well as cheating intentions and self-reports of cheating.

Theory of Reasoned Action in Accounting

In a study of taxpayer compliance issues, Hanno and Violette (1996) used the TORA model to identify beliefs and norms that underlie taxpayer compliance decisions. The subjects in their study exhibited a strong link between their intentions to comply in both self-reported and hypothetical tax compliance behavior. In addition, the independent variables of attitude toward tax compliance and subjective norm both contributed significantly to the prediction of tax compliance intentions.

Theory of Reasoned Action in Accounting Ethics

In what may be the first study in accounting ethics using the TORA model, Gibson and Frakes (1997) found individuals were unwilling to accurately report either unethical behavior or intention, particularly in situations where there is no question as to the unacceptability of the action or the potential penalty as presented in the AICPA Code of Professional Conduct. They continued to state the unwillingness to accurately report ethical conduct may be particularly true in accounting, where the penalty for violating the AICPA Code of Professional Conduct demeaned the profession as a whole in the eyes of the public, was linked to audit failures, and carried the threat of expulsion from the profession. Therefore when using a theory such as the TORA, which assists in the explanation of intention and behavior, we must also ensure "ac-

curate" responses when reliant on self-reporting. Gibson and Frakes (1997) concluded:

> The theory of reasoned action provides a useful theoretical explanation for unethical behavior among CPAs in the state of Washington. An accountant's intention to behave unethically is a function of both attitudes toward performing the behavior and social pressure, as well as the beliefs behind these constructs. Accountants appear to be unwilling to accurately report either unethical behavior or intention, particularly in situations where there is no doubt as to the unacceptability of the action or the potential penalty as presented in the AICPA Code of Professional Conduct.

Cohen, Pant and Sharp (1994) employed the TORA to identify the behavioral determinants of auditor aggressiveness in client relations. They examined individual aggressiveness from the perspective that a willingness of professional auditors to promote their personal interest or that of the firms may result in choices that move closer to compromising ethical or professional standards of conduct. The results of their study indicated the model's overall fit was appropriate, and its two variables (attitudes and subjective norms) were highly associated with the aggressiveness intention variable.

Buchan (2005), in a study of the theory of planned behavior which is an extension of the theory of reasoned action found strong support for a direct relationship between attitudes and ethical intentions. In his study the proposed direct effect of subjective norms was not supported. However, a significant relationship between subjective norms and attitudes was determined. Professionals' attitudes towards ethical issues clearly influenced intentions in this study. While the literature is rich with studies that test the TORA there are none that directly test the TORA in explaining auditor ethical decisions.

METHODOLOGY AND SURVEY INSTRUMENT

To understand and measure the impact of the Theory of Reasoned Action (TORA) on ethical decision making, data needed to be captured that measured subjects' attitudes toward ethical behavior, the perceived behavior expected by the auditing profession (subjective norms), and the intention to make an informed ethical decision.

The subjects for the study included senior accounting majors at the conclusion of an undergraduate auditing class. There were 67 students in total, 35 females and 32 males. The students were provided a questionnaire which consisted of 37 questions subjectively identified as dealing with attitudes (14 questions), subjective norms (12 questions) and Intentions (11 questions). The survey was developed using an instrument developed, tested, and used in a study of the audit expectations gap in Britain (Humphrey, et. al., 1993). Modifications were implemented by Grambling, et.al. (1996), in recognition of differences in auditing and accounting issues between Britain and the United States, and the Grambling et.al. (1996) questionnaire served as the basis of the instrument used in the present study. The instrument was modified to fit the intent of the present study and consisted of four primary sections: 1) a set of questions designed to measure subject attitudes toward ethical behavior in general (attitudes); 2) a set of questions designed to measure attributes the subjects would associate with ethical attitudes of auditors (Subjective Norms); 3) a set of questions dealing with how the subjects would react to ethical situations in an audit environment (Intentions), and 4) two short vignettes used to determine actions that participants as auditors would make in situations involving an ethical dilemma. The responses to the questions and vignettes were measured using a 7 point fully anchored scale.

The two vignettes required two responses. Vignette one dealt with insider trading and vignette two concerned a food manufacturer selling contaminated baby food and the disclosure to the public.

FIGURE 2
TORA (DIRECT RELATIONSHIPS)
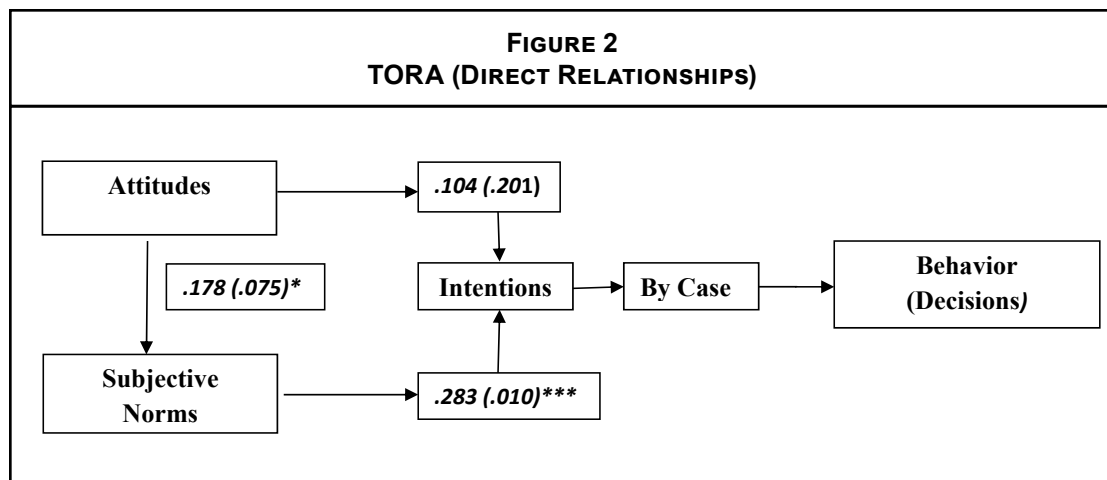
DATA ANALYSIS

Factor Analysis

Scale responses were factor-analyzed using principal components analysis to determine the degree of correspondence between scale questions and the three expected dimensions (attitudes, subjective norms, and intentions). Varimax rotation was used with a cutoff score of Ø.5 for factor retention. The principal components analysis yielded three interpretable factors from the scale. Of the 14 questions identified as measuring subject attitudes toward ethical behavior, seven exhibited factor scores exceeding Ø.5. Of the 12 questions that were identified as measuring subjective norms six exhibited factor scores exceeding Ø.5 and of the eleven questions identified as subject intentions to make ethical decisions, five exhibited factor scores of Ø.5 or greater. Collectively, the three factors explained 52.995 percent of the variance in the scale items: 21.796 percent for the *Attitude* factor, 17.289 percent for the *Subjective Norms* factor and 13.910 for the *Intentions* factor.

The Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) was calculated as well as the Bartlett's Test of Sphericity. The KMO was .685 which indicates an acceptable level of sampling adequacy. The Bartlett's Test showed an approximate Chi-Square of 591.578 with 171 degrees of freedom and a significance level of .000.

Regression Analysis

The first step in measuring the direct correlations of the variables in the TORA model calculated the correlation of the two variables, *Attitudes* and *Subjective Norms,* to *Intentions.* The regression analysis showed only *Subjective Norms* (.283, sig .010) with a significant correlation with intentions. There was also a less significant correlation between the two variables, *Attitudes* and *Subjective norms* (.178, sig .075), which the prior literature has shown is fairly common. The measured correlation between *Intentions* and the cases are case specific.

Vignette 1, Question 1

Question one, dealing with insider trading and the auditor referring to the matter in the audit report indicated **Intentions** being significantly correlated with the decision (.269, sig .014). **Subjective Norms** also indicated a significant correlation with this decision (.546, sig .000). The subjects on this part of the first vignette were 67% confident they would refer to the matter in the audit report. The significant correlation of subjective norms with the case decision seemed to indicate the subjects' perception of what the audit profession would expect was and represented a major explanatory factor in that decision.

Vignette 1, Question 2

The analysis of question two dealing with reporting the transaction to the SEC was con-

VIGNETTE 1 **INSIDER TRADING**		
Vignette 1: During the course of the audit of an international construction group, the auditors discovered a case of insider dealing. In the week prior to the public announcement of a major overseas contract, the chief executive officer purchased a significant number of the company's shares on the Stock Exchange. After the announcement of the contract, the price of the shares rose by 40% and in the subsequent two weeks the director reduced his/her shareholding to its previous level.		
Question 1: How likely is it that you as the auditor will refer to the matter in the audit report?		
Data:		
	Intentions	Case/Decision
Attitudes	.104 (.201)	.050 (.345)
Subjective Norms	.283 (.010)***	.546 (.000)***
Intentions		.269 (.014)***
Question 2 How likely is it that you as the auditor will report the transaction to the appropriate regulatory authority?		
Data:		
	Intentions	Case/Decision
Attitudes	.104 (.201)	.088 (.239)
Subjective Norms	.283 (.010)***	.488 (.000)***
Intentions		.185 (.067)**

sistent with the analysis of the first question in vignette 1. **Subjective Norms** was significantly correlated with decision (.488, sig .000) with **Intentions** significant at the .067 level (.185, sig .067). Subjects were even more confident (more than 70%) they would report the matter to the appropriate regulatory authority (SEC). Once again the perception of what the auditing profession would expect appears to drive the high correlation of subjective norms on the decision.

Vignette 2, Question 1

Question one in vignette two dealing with disclosure of the matter showed a significant indirect correlation of **Subjective Norms** (.349, sig .001), while **Intentions** was significant at the .064 level (.188, sig .064). In this vignette the subjects were over 70% confident they would report the matter. Subjective norms being signifi-

cantly correlated with the decision appears to be consistent with prior decisions. In other words, the subjects appear to believe the auditing profession would expect them to report the matter.

Vignette 2, Question 2

Question two in vignette two showed a significant correlation between **Subjective Norms** and the question of referring to the matter in the audit report (.349, sig .002), while **Intentions** showed significance at the .067 level (.185, sig .067). Subjects were over 70% confident they would refer to the matter in the audit report. Once again the perception that the audit profession would expect them to act in an ethical manner is very highly correlated with the decision.

	VIGNETTE 2 INSIDER TRADING	
Vignette 2:		
The auditors of a food manufacturing company discovered the company sold a contaminated baby product. This information is known only by trusted employees and by the chief executive. The potential liability of the company is a significant amount, but the chief executive does not want the information to be made public and has threatened to change auditors if they do so.		
Question 1:		
How likely is it that you as the auditor will report the matter to the appropriate public health agency?		
Data:		
	Intentions	Case/Decision
Attitudes	.104 (.201)	.075 (.272)
Subjective Norms	.283 (.010)***	.362 (.001)***
Intentions		.188 (.064)**
Question 2		
How likely is it that you as the auditor will refer to the matter in the audit report?		
Data:		
	Intentions	Case/Decision
Attitudes	.104 (.201)	.096 (.219)
Subjective Norms	.283 (.010)***	.349 (.002)***
Intentions		.185 (.067)**

DISCUSSION

The TORA posited that attitudes toward a particular behavior and subjective norms will be correlated with a subjects intention to make a certain decision. In this study, subject attitudes toward ethical behavior were theoretically present before the auditing class. The audit class included instruction concerning the professional code of conduct and perceived ethics of the profession. These attitudes were not correlated with the intention to make the specific auditing related ethical judgments. . The other variable in the TORA model, subjective norms, which were perceptions the subjects had about the expected behavior of an auditor were correlated with behavioral intentions and in most cases were positively indirectly correlated with the decisions. This result would appear to answer the question of "can ethics be taught." In other words, the subjects made auditing related ethical decisions on the vignettes using the ethical values learned in the audit class.

The positive correlation between subjective norms and intentions and also the positive correlation between subjective norms and the decisions, seems to indicate the perception of the expectations of the auditing profession are an important attribute to the decision process when dealing with auditing ethical issues. The lack of correlation between overall attitudes concerning ethical behavior with intentions and case decisions seems to indicate previous learned behavior regarding ethical behavior as supplemented by the AICPA Professional Code of Conduct in decision models had little impact on auditing ethical judgments. The correlation between Attitudes and Subjective Norms while relatively small (.178, sig.075) would appear to be impacting the overall impact of the intention variable.

This study used auditing students as subjects, which is a potential weakness; however, the literature shows that in certain situations students can be reliable subjects. In this study, the

removal of the potential bias of practicing auditors being reluctant to provide honest responses seems to be one of the situations where students are viable subjects.

Future research in this area, should explore the attitude link in the TORA. This could include better questions focused on capturing the inherent ethical beliefs of the subjects. Also the theory of planned behavior, an extension of the TORA could be explored.

REFERENCES

Albrecht, S.L. and K.E. Carpenter, 1976. Attitudes as Predictors of Behavior Versus Behavior Intentions: A Convergence of Research Traditions, *Sociometry 39, 1-10.*

Ajzen, I. and M. Fishbein, 1980. Understanding Attitudes and Predicting Social Behavior, Prentice Hall, Englewood Cliffs, NJ)

Buchan, H.F., 2005. Ethical Decision Making in the Public Accounting Profession: An Extension of Ajzen's Theory of Planned Behavior. *Journal of Business Ethics 61, 165-181.*

Cohen, J., L. Pant, and D. Sharp, 1994. Behavioral Determinants of Auditor Aggressiveness in Client Relations, *Behavioral Research in Accounting,* Vol 6, 121-143.

DeVries, D. L. and L. Ajzen, 1971. The Relationship of Attitudes and Normative Beliefs to Cheating in College, *Journal of Social Psychology 83, 199-207.*

Fredricks, A.J. and D.L. Dossett, 1983. Attitude-Behavior Relations: A Comparison of the FIshbein-Ajzen and the Bentler-Speckart Models, *Journal of Personality and Social Psychology, 45, 501-512.*

Fishbein, M., and I. Ajzen, 1975. Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research. Reading, MA. Addison-Wesley.

Grambling, A.A., J.W. Schatzberg, and W.A. Wallace, 1996. The role of undergraduate auditing coursework in reducing the expectations gap. *Issues in Accounting Education* 11 (1): 131-161.

Gibson A.M. and A.H. Frakes, 1997. Truth or Consequences: A Study of Critical Issues and Decision Making in Accounting', *Journal of Business Ethics* 16, 161-171.

Hanno H.M. and G.R. Violette, 1996. An Analysis of Moral and Social Influences on Taxpayer Behavior, *Behavioral Research in Accounting, Vol 8 Supplement, 57-79.*

Humphrey, C., P. Moizer, and S. Turley. 1993. The audit expectations gap in Britain: An empirical investigation. *Accounting and Business Research* (Winter): 395-411.

Randall, D.M. and A.M. Gibson, 1991. Ethical Decision Making in the Medical Profession: An Application of the Theory of Planned Behavior. *Journal of Business Ethics* 10, 111-122.

Sheppard, B.H., J. Hartwick and P.R. Warshaw, 1988. The Theory of Reasoned Action: A Meta Analysis of Past Research with Recommendations for Modifications and Future Research. *Journal of Consumer Research 15, 325-343.*

Sutton. M.H. 2002. Financial Reporting at a Crossroads. *Accounting Horizons* (December): 319-328.

Trafimow, D. and M. Fishbein, 1994. The importance of risk in determining the extent to which attitudes affect intentions to wear seat belts. *Journal of Applied Social Psychology,* 24, 1-11.

Trafimow, D. and M. Fishbein, 1995. The Moderating Effect of Behavior Type on the Subjective Norn-Behavior Relationship. *Journal of Social Psychology, 134, 755-763.*

Intellectual Capital Disclosure and the Cultural and Legal Differences of Nations

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ABSTRACT

Hypothesis: variations in intellectual capital disclosures are related to the cultural and legal differences of nations. Twenty-five studies analyzing the intellectual capital disclosure for twenty-countries were used to obtain disclosure measures. Hofstede's expanded six dimension cultural model provided measures of the culture of these twenty-countries. A regression analysis related each of the three categories of intellectual capital disclosure (structural, human and relational capital) to the six dimensions of culture (power distance, individualism, achievement, uncertainty avoidance, long-term orientation and indulgence). Structural capital was found to be related to power distance and uncertainty avoidance; human capital to both power distance and individualism; and relational capital to individualism. Regression analysis was also used to relate the intellectual capital disclosure to the legal system of the nation (common law, civil law, or other). None of the legal systems were significantly related to the categories of intellectual capital disclosure.

INTRODUCTION

Intellectual capital disclosure has been proposed as a means to improve external reporting. Improvements can be grouped into five categories. First, intellectual capital can be used to close the gap between book value and market value. Second, intellectual capital provides improved information about the "real value" of the organization. Third, intellectual capital disclosure serves to reduce information asymmetry. Fourth, disclosures of intellectual capital can increase a company's ability to raise capital by providing a valuation on intangibles. Fifth, disclosures of intellectual capital can enhance an organization's reputation [Andriessen (2004)]. Numerous studies have investigated the intellectual capital disclosure for many different countries and have noted differences in both the amount of disclosure and the relative amounts of disclosure (for a review see Dielis (2007)).

Several studies have questioned whether the intellectual capital disclosure differences among countries may be due to cultural differences among nations. Chaminade and Johanson (2003) argue that the amount of intellectual capital disclosure as well as the approach taken will vary across countries due to differences in national culture. Herremans and Isaac (2007) studied intellectual capital disclosure at the organizational level, testing whether differences in the development and emphasis of intellectual capital differs with culture. Dielis (2007) compared the level of intellectual capital disclosure for seven countries, finding the level varied across countries and that culture is a driver of the level of disclosure.

Similarly, studies have investigated whether national culture influences differences in national accounting practices and financial reporting in general. Gray (1988) has postulated that national culture influences national reporting characteristics such as uniformity/flexibility, conservatism/optimism, and secrecy/transparency. Ding, Jeanjean and Stolowy (2005) found that the level of harmonization of international reporting standards and national standards were related to measures of national culture. MacArthur (2006) investigated the impact of culture on management accounting practices in Germany and the US and found that variations in culture leads to differences in practices.

Other studies have investigated whether the legal system of a nation is related to the amount of financial disclosures. The legal system in use varies across nations and can be categorized as predominately common law (found primarily in Anglo-American countries), civil or code law (found in countries influenced by continental Europe), or "other" (including muslim law or customary law). La Porta et al (1997) found that differences in the legal environments of nations has a relationship to the size and extent of the nation's capital markets. Jaggi and Low (2000) found that common law countries have greater financial disclosures, but had mixed results in relating culture with the financial disclosures. Hope (2003), on the other hand, found that cultural differences as well as the legal system have an explanatory power for financial disclosure levels.

This paper focuses on intellectual capital disclosure rather than financial reporting and will investigate whether the relative differences in which types of intellectual capital are being disclosed differs across countries and whether the differences can be explained by differences in either the legal system or the national culture.

Cultural Differences of Nations

Hofstede has defined culture as "...the collective mental programming of the human mind which distinguishes one group of people from another. This programming influences patterns of thinking which are reflected in the meaning people attach to various aspects of life and which become crystallized in the institutions of a society." (http://geert-hofstede.com/countries.html) Cultural differences can be measured along six dimensions of culture. These six dimensions are: (1) power distance, (2) individualism versus collectivism, (3) masculinity versus femininity, (4) uncertainty avoidance, (5) long-term versus short-term orientation, and (6) indulgence versus restraint. The fifth (long-term versus short-term orientation) and sixth (indulgence versus restraint) dimensions have not been measured for as many countries in the past and have been excluded from most studies. Until recently, only the first four dimensions were measured. However, in recent work published (Hofstede, Hofstede, Minkov (2010)), measurements are now available for a broad sample of countries for all six dimensions.

The six dimensions can be described as follows (Hofstede, Hofstede, Minkov (2010)):

Power distance (PDI) is the degree to which the less powerful members of society accept and expect that power is not distributed in an equal fashion. The basic issue is how inequalities among people are handled by society. A culture with a large degree of power distance will have a hierarchical order in which everybody has a place while a culture with a low power distance strives to equalize the distribution of power.

Individualism (IDV) is the preference for a loose social framework where individuals are expected to take care of themselves and their immediate families only. Collectivism is a tightly-knit society in which individuals can expect their relatives or associated group members to look after them in exchange for unquestioning loyalty.

Achievement orientation (ACH) has traditionally been labeled Masculinity/Femininity. Masculinity is a preference for achievement, heroism, assertiveness and material reward for success. A masculine society as a whole is more competitive. Femininity is a preference for co-operation, modesty, caring for the weak and quality of life. A feminine society as a whole is more consensus-oriented.

Uncertainty avoidance (UAI) is the extent to which people feel threatened or uncomfortable with uncertainty and ambiguity. Countries with a strong uncertainty avoidance maintain rigid codes of belief and behavior and are intolerant of the unorthodox. Countries with weak uncertainty avoidance maintain a more relaxed attitude in which practice is more important than principles.

Long-term orientation (LTO) is the fostering of virtues that are oriented toward future rewards. In a society with a strong long-term orientation there is a propensity to save and invest, thriftiness, and perseverance in achieving results. Short-term orientation exhibits great respect for traditions, a lesser propensity to save for the future, and a focus on achieving quick results.

Indulgence (IVR) is demonstrated in a society that allows relatively free gratification of the human drive to enjoy life and have fun. Restraint is demonstrated in a society where the gratification of needs is suppressed and is regulated through strict social norms. This dimension was not part of Hofstede's original work, but has been added recently.

Legal Systems

There are two major families of legal systems: common and civil (or code). Common law systems are based on precedents from judicial systems. The law is formed by judges' decisions on specific disputes. The common law tradition started in England and spread through colonization. Civil or code law originated in the Roman Empire and is based on statutes and codes. Code law has a tradition based on continental Europe.

Non-western countries have legal systems that are often a mixture of religious law, law based on customs, or a mixture of common and code law. For example, China has a mixture of civil law and socialist principles while Israel has a mixture of common, civil, muslim and jewish law.

Intellectual Capital Disclosure

There have been numerous taxonomies used to categorize intellectual capital disclosure. Sveiby (1997) classifies intellectual capital as employee competence, internal structure, and external structure. Stewart (2001) uses the terms human capital, structural capital, and customer capital. Edvinssson (2002) uses just two categories, human capital and structural capital, combining internal structural capital with customer (Stewart) or external structure (Sveiby). Most studies that have followed have used a three factor breakdown: human capital, structural capital, and customer capital. More recent studies have used the term relational capital rather than customer capital.

Gudergan and Soo (2001) considered several relationships between intellectual capital disclosure and Hofstede's cultural dimensions. Gudergan and Soo argued that both structural capital and relational capital are linked to in-

teractions either within a collective or between collectives and that these interactions would be weaker in those societies that are characterized as more individualistic. They also argued that the relationship between intellectual capital and collectivistic cultures is greater for structural capital than for relational capital. Finally, they proposed that structural and relational capital will be greater in cultures with a lower degree of power distance or a lower degree of uncertainty avoidance. All of these proposed relationships (with the exception of the second) relate to the amount of disclosure, not differences between categories.

Numerous studies have presented the results of an analysis of the degree of intellectual capital disclosure for either a single country or a small sampling of countries. Most of the studies to date have been descriptive, describing how much intellectual capital disclosure exists and the breakdown of the disclosure into the categories of intellectual capital. This study attempts to measure the differences in the categories of intellectual capital disclosure and to relate this to differences in the measures of national culture. To that end, past studies are used in a meta-analysis to compare the three categories of intellectual capital disclosure with the six cultural dimensions.

PROPOSITIONS

Past studies have proposed that the variations in national accounting systems are related to the culture of the countries. In addition, it has been shown that different nation's responses to international accounting standards are also related to national cultural differences. Since intellectual capital disclosure is a form of non-financial performance measures and is included in the accounting annual reports, are similar cultural differences seen in the intellectual capital disclosures?

Proposition #1: Variations in intellectual capital disclosures among nations are related to the cultural differences of nations.

Other studies have proposed that the legal system of a nation has an impact on what is disclosed by companies. Using a similar argument

as for proposition #1, are similar legal differences seen in the intellectual capital disclosures?

Proposition #2: Variations in intellectual capital disclosures among nations are related to the differences in the legal systems of nations.

DATA AND SAMPLE

Twenty-five studies were identified that analyzed intellectual capital disclosure. These studies were published between 2000 and 2011, and investigated twenty different countries. The object of study was the intellectual capital disclosure in an organization's annual report (23 studies) or initial public offering (IPO) registration statements (2 studies). All 25 studies used a form of content analysis to quantify the intellectual capital disclosure (see Guthrie and Petty (2000) for a discussion of content analysis). Sample sizes ranged from a low of 11 organizations to a high of 334. Twenty-three of the studies analyzed for-profit organizations; two studies (Steenkamp (2007) and Holmen (2011)) also included not-for-profit and/or governmental organizations. Table 1 presents an overview of the studies.

Most of the studies investigated a single country (22 of the studies), one study investigated two countries, one study investigated three countries, and one study investigated seven countries. Ten countries were investigated once, seven countries were investigated twice, two countries three times, and one country was investigated in four separate studies.

The metric that is used is the proportionate breakdown of the three forms of intellectual capital: structural capital, human capital, and relational capital. Some of the studies reported the proportions, other studies reported a frequency for each. If frequencies were reported, a proportion was calculated by taking the category frequency divided by the total frequency for all three categories. When multiple studies analyzed a country, the proportionate breakdowns of intellectual capital disclosure were averaged into a single value. Table 2 presents the descriptive statistics for structural, human, and relational capital.

TABLE 2 SAMPLE STATISTICS			
	Structural	**Human**	**Relational**
Mean	0.364	0.272	0.365
Standard Error	0.017	0.015	0.019
Median	0.345	0.259	0.389
Minimum	0.215	0.097	0.194
Maximum	0.490	0.407	0.488

Intellectual capital disclosure, on average, consisted of 36.4% structural capital, 27.2% human capital and 36.5% relational capital. The individual countries varied in what was disclosed, however, with structural capital consisting of between 21.5% and 49% of the disclosure, human capital ranging between 9.7% and 40.7%, and relational capital ranging from 19.4% to 48.8% of the disclosure. To test whether the differences in disclosure is significant a t-test for the difference in means was performed. The difference observed between human capital and either structural capital or relational capital was statistically significant at the 1% level. The difference between structural capital and relational capital was not significant.

Measurements for the six cultural dimensions are found in Hofstede, Hofstede, Minkov (2010). As noted earlier, prior studies limited their analysis to the first four dimensions due to data availability. Legal system classification was found in http://www.juriglobe.ca/eng/sys-juri/index-alpha.php.

Table 3 presents the correlations for the cultural dimensions and the legal classification. Notice that the cultural dimensions of Power Distance and Individualism are highly correlated. The cultural dimension of Indulgence is highly correlated with Power Distance, Individualism, and Long-Term Orientation. Common law is highly correlated with the cultural dimensions of Uncertainty Avoidance and Long-Term Orientation; civil law is highly correlated with Uncertainty Avoidance and Other Legal System is highly correlated with Uncertainty Avoidance, Individualism, Long-Term Orientation, and Indulgence.

TABLE 1					
SAMPLE CHARACTERISTICS					
Author	**Year of Publication**	**Country**	**Sample Size**	**Year of Sample**	**Annual Report or IPO**
Guthrie and Petty	2000	Australia	20	1998	AR
Brennan	2001	Ireland	11	1998	AR
April, Bosma & Deglon	2003	South Africa	20	2000	AR
Bozzolan, Favotto and Ricceri	2003	Italy	30	2001	AR
Goh & Lim	2004	Malaysia	20	2001	AR
Abdolmohammadi	2005	US	58	1993-1997	AR
Bukh, Nielsen, Gormsen and Mouritsen	2005	Denmark	68	1990-2001	IPO
Vandemaele, Vergauwen and Smits	2005	Netherlands Sweden UK	20 20 20	1998,2000,2002	AR
Guthrie, Petty & Ricceri	2006	Australia Hong Kong	50 100	2002	AR
Oliveira, Rodrigues & Craig	2006	Portugal	56	2003	AR
Dielis	2007	France Germany Italy Netherlands Spain Sweden US	25 25 25 25 25 25 25	2004-2006	AR
Singh and Van der Zahn	2007	Singapore	334	1997-2004	IPO
Steenkamp	2007	New Zealand	30	2004	AR
Sujan & Abeysekera	2007	Australia	20	2004	AR
Abeysekera	2008	Singapore	20	1998-2000	AR
Oliveras, Gowthorpe, Kasperskaya & Perramon	2008	Spain	12	2000-2002	AR
Schneider & Samkin	2008	New Zealand	82	2004/2005	AR
Sonnier	2008	US	143	2000, 2004	AR
Sonnier, Carson & Carson	2008	US	141	2000, 2004	AR
Whiting and Miller	2008	New Zealand	70	2003	AR
Rimmel, Nielsen & Yosano	2009	Japan	120	2003	AR
Yau, Chun & Balaraman	2009	Malaysia	60	2003	AR
Yi & Davey	2010	China	49	2006	AR
Holmen	2011	Denmark	16	2000-2006	AR
Singh & Kansal	2011	India	20	2009	AR

The strongest correlation observed is between common law and civil law. Countries in the sample have either a common law system or a civil law system. Only one country, South Africa, has a mixture of both common and civil law. Six countries had a mixture of common law and other (4 countries) or civil law and other (2 countries).

		PDI	IDV	ACH	UAI	LTO	IVR	Common	Civil	Other
Culture	**PDI**	1.ØØ								
	IDV	-Ø.79**	1.ØØ							
	ACH	Ø.15	-Ø.Ø5	1.ØØ						
	UAI	Ø.Ø6	Ø.Ø3	Ø.18	1.ØØ					
	LTO	Ø.32	-Ø.38	Ø.2Ø	Ø.1Ø	1.ØØ				
	IVR	-Ø.64**	Ø.69**	-Ø.33	-Ø.29	-Ø.52*	1.ØØ			
Legal	**Common**	Ø.Ø9	Ø.Ø4	Ø.33	-Ø.55*	-Ø.48*	Ø.22	1.ØØ		
	Civil	-Ø.1Ø	-Ø.Ø2	-Ø.28	Ø.55*	Ø.4Ø	-Ø.16	-Ø.9Ø**	1.ØØ	
	Other	Ø.75**	-Ø.78**	Ø.31	-Ø.28	Ø.49*	-Ø.58**	Ø.22	-Ø.29	1.ØØ

Table 3
Correlations of Culture and Legal Variables
(Culture: PDI, IDV, ACH, UAI, LTO, IVR; Legal: Common, Civil, Other)

** significant at p < .Ø1
* significant at p < .Ø5

FINDINGS

The first proposition analyzed was whether the variations in intellectual capital disclosures are related to the cultural differences of nations. This proposition was tested using a regression analysis. The form of the general linear model is shown below.

To derive estimates of the coefficients, three separate univariate regression models were estimated. Multivariate regression analysis could have been used to simultaneous evaluate the three intellectual capital metrics; the individual coef-

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GENERAL LINEAR MODEL

Structural = intercept + α_1 Culture: PDI + β_1 Culture: IDV + χ_1 Culture: ACH + δ_1 Culture: UAI + ε_1 Culture: LTO + ϕ_1 Culture: IVR

Human = intercept + α_2 Culture: PDI + β_2 Culture: IDV + χ_2 Culture: ACH + δ_2 Culture: UAI + ε_2 Culture: LTO + ϕ_2 Culture: IVR

Relational = intercept + α_3 Culture: PDI + β_3 Culture: IDV + χ_3 Culture: ACH + δ_3 Culture: UAI + ε_3 Culture: LTO + ϕ_3 Culture: IVR

Where:

Structural = % ICD being structural capital
Human = % ICD being human capital
Relational = % ICD being relational capital

and culture values being taken from Hofstede (2Ø1Ø):

Culture: PDI= power distance
Culture: IDV = individualism/collectivism
Culture: ACH= achievement orientation (masculine/feminine)
Culture: UAI = uncertainty avoidance
Culture: LTO =long-term orientation
Culture: IVR =indulgence

		Intercept	Culture					
			PDI	IDV	ACH	UAI	LTO	IVR
Panel A: Structural Capital								
Full model	coefficients	0.1087	0.0024	0.0004	-0.0001	0.0014	0.0002	0.0007
	p-value	0.498	0.065	0.728	0.890	0.056	0.830	0.655
R^2	47.5%							
Reduced	coefficients	0.2127	0.0017	-	-	0.0013	-	-
	p-value	0.000	0.016	-	-	0.027	-	-
R^2	44.8%							
Panel B: Human Capital								
Full model	coefficients	0.5290	-0.0025	-0.0029	-0.0002	-0.0005	0.0006	.0008
	p-value	0.002	0.030	0.018	0.785	0.462	0.439	0.535
R^2	49.0%							
Reduced	coefficients	0.5849	-0.0028	-0.0029	-	-	-	-
	p-value	0.000	0.008	0.004	-	-	-	-
R^2	40.5%							
Panel C: Relational Capital								
Full model	coefficients	0.3640	0.0001	0.0024	0.0003	-0.0010	-0.0008	-0.0015
	p-value	0.084	0.939	0.131	0.756	0.272	0.471	0.429
R^2	35.3%							
Reduced	coefficients	0.2572	-	0.0018	-	-		
	p-value	0.000	-	0.023	-	-		
R^2	25.4%							

TABLE 4
REGRESSION RESULTS: CULTURAL DIMENSIONS

ficients, as well as their standard errors will be the same using a univariate regression as those produced by the multivariate regression. Table 4 presents the estimates for the three regression models:

Panel A of Table 4 presents the regression results for structural capital. The full model includes all six dimensions of culture and yields an R^2 of 47.5%. However, not all of the six dimensions are statistically significant. A stepwise regression yields a reduced model with two significant culture variables: PDI and UAI. The R^2 of this reduced model is 44.8%. In addition, the coef-

ficients for the culture variables are positive; the higher the PDI or UAI score, the greater the proportion of structural capital in the intellectual capital disclosure. It can be inferred from this that a nation with a higher PDI score will be a more hierarchical society; structural capital contains such items as models and computer systems, strategy, structures, routines and procedures, all of which relate to hierarchy. Uncertainty avoidance also relates to hierarchy and yields a similar inference.

Panel B presents the regression results for human capital. The full model includes all four di-

mensions of culture and yields an R^2 of 49.0%. A stepwise regression yields a reduced model with two significant culture variables: in this case PDI and IDV. The R^2 of this reduced model is 40.5%. In this case, however, the coefficients for the culture variables are negative; the higher the PDI or IDV score, the lower the proportion of human capital in the intellectual capital disclosure. Since human capital consists of employee competence and the capacity to create value, a negative coefficient for PDI infers that the more hierarchical the culture, the less human capital will be disclosed. Similarly, the higher the individualism score, the less human capital will be disclosed. The converse is also true: the lower the individualism score, the more collective the culture and the more human capital will be disclosed.

Panel C presents the regression results for relational or customer capital. The full model includes all four dimensions of culture and yields an R^2 of 35.3%. A stepwise regression yields a reduced model with a single significant culture variable: IDV. The R^2 of this reduced model is 25.4%. The coefficient for the culture variables is positive; the higher the IDV score, the greater the proportion of relational capital in the intellectual capital disclosure. This result is contrary to Gudergan and Soo's conjecture that relational capital would be weaker in those societies that are characterized as more individualistic.

The second proposition analyzed was whether variations in intellectual capital disclosures among nations are related to the differences in the legal systems of nations. This proposition was also tested using regression analysis. Due to the high degree of correlation between Legal: Common and Legal: Civil, only Legal: Common will be included in the linear model. The form of the general model tested is shown bleow.

Panel A of Table 5 presents the regression results for structural capital. The full model includes both variables for the legal system and yields an R^2 of 15.8%. However, neither of the variables are statistically significant. A stepwise regression failed to yield a reduced model with significant variables. It can be concluded that the variation in the structural capital disclosure is not related to the legal system of the country.

Panel B presents the regression results for human capital. The full model includes both variables for the legal system and yields an R^2 of 6.6%. As was the case for structural capital, neither of the variables are statistically significant. Similar to structural capital, a stepwise regression failed to yield a reduced model with significant variables and so it can be concluded that the variation in the human capital disclosure is not related to the legal system of the country.

Panel C presents the regression results for relational capital. The full model includes both variables for the legal system and yields an R^2 of 29.2%. In this model only the Legal: Other variable is statistically significant at the 5% level. However, when stepwise regression was used, the Legal: Other variable was not significant at the 5% level. The overall conclusion therefore is

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FORM OF THE GENERAL MODEL TESTED

Structural = intercept + α_1 Legal: Common + β_1 Legal: Other

Human = intercept + α_2 Legal: Common + β_2 Legal: Other

Relational = intercept + α_3 Legal: Common + β_3 Legal: Other

Where:

    Structural = % ICD being structural capital
    Human = % ICD being human capital
    Relational = % ICD being relational capital

and legal systems being identified at http://www.juriglobe.ca/eng/sys-juri/index-alpha.php:

    Legal: Common= common law system
    Legal: Other = other legal system (muslim, customary)

TABLE 5				
REGRESSION RESULTS: LEGAL SYSTEMS				
			Legal	
		Intercept	Common	Other
Panel A: Structural Capital				
Full model	coefficients	0.3749	-0.0471	0.0539
	p-value	0.000	0.191	0.171
R^2	15.8%			
Panel B: Human Capital				
Full model	coefficients	0.2620	-0.0096	0.0389
	p-value	0.000	0.772	0.289
R^2	6.6%			
Panel C: Relational Capital				
Full model	coefficients	0.3632	0.0570	-0.0933
	p-value	0.000	0.128	0.028
R^2	29.2%			
Reduced	coefficients	0.3877	-	-0.0798
	p-value	0.000	-	0.058
R^2	18.5%			

that intellectual capital disclosure does not vary in content across different legal systems.

CONCLUSIONS AND LIMITATIONS

The first major conclusion of this study is that the differences seen among nations in the categories of intellectual capital disclosure are statistically significant. The differences between either structural capital and human capital or relational capital and human capital are significant at the .01 level of significance. The differences observed between structural and relational capital are not statistically significant.

The second major conclusion is that there is a statistically observed relationship between several of Hofstede's cultural dimensions and the categories of intellectual capital disclosure. Structural capital is seen to be statistically related to the cultural dimensions of power distance and uncertainty avoidance. Human capital is seen to be statistically related negatively to power distance and individualism. Relational capital is statistically related only to individualism.

It is interesting to note that neither of the two more recent additions to Hofstede's cultural model (long-term orientation and indulgence) were found to be related to the categories of disclosure. This finding implies that past studies that looked only at the four original cultural dimensions are still valid.

The third major conclusion is that there is no statistically significant relationship between the categories of intellectual capital disclosure and the legal system in the nations. This is in contrast with Hope (2003) where both cultural dimensions and legal systems were related to financial disclosure. This difference may be due to the non-financial nature of most of the intellectual capital disclosures.

There are a number of limitations to this study. First, since this was a meta-analysis of previous research, there is no guarantee that all relevant studies were represented. Second, half of the countries studied were done so by a single study; only one country was investigated more than three times. Third, although content analysis

was used as the means to measure intellectual capital disclosure, there were minor differences in the terms used in the analysis. Fourth, while most of the studies used a company's annual report as the basis of analysis, two studies used IPO registration statements.

REFERENCES:

Abdolmohammadi, M. (2005), "Intellectual capital disclosure and market capitalization", *Journal of Intellectual Capital*, Vol. 6, No. 3, pp. 397-416.

Abeysekera, I. (2008), "Intellectual capital disclosure trends: Singapore and Sri Lanka", *Journal of Intellectual Capital*, Vol. 9, No. 4, pp. 723-737.

Andriessen, D. (2004), "IC Valuation and Measurement: Classifying the State of the Art," *Journal of Intellectual Capital*, Vol. 5, No. 2, pp. 230-242.

April, K., Bosma, P. and Deglon, D. (2003), "IC measurement and reporting: establishing a practice in SA mining", *Journal of Intellectual Capital*, Vol. 4, No. 2, pp. 165-180.

Bozzolan, S., Favotto, F. and Ricceri, F. (2003), "Italian annual intellectual capital disclosure, an empirical analysis", *Journal of Intellectual Capital,* Vol. 4, No. 4, pp. 543-558.

Brennan, N. (2001), "Reporting intellectual capital in annual reports: evidence from Ireland", *Accounting, Auditing & Accountability*, Vol. 14, No. 4, pp. 423-436.

Bukh, P., Nielsen, C., Gormsen, P. and Mouritsen, J. (2005), "Disclosure of information on intellectual capital in Danish IPO prospectuses", *Accounting, Auditing & Accountability Journal*, Vol. 18, No. 6, pp. 713-732.

Chaminade, C., and Johanson, U. (2003), "Can guidelines for intellectual capital management and reporting be considered without addressing cultural differences?", *Journal of Intellectual Capital,* Vol. 4, No. 4, pp 528-542.

Dielis, M. (2007) "Intellectual capital disclosure in corporate annual reports: establishing culture as a driver and discovering trends", unpublished Master's Thesis, Maastricht University.

Ding, Y., Jeanjean, T. and Stolowy, H. (2005), "Why do national GAAP differ from IAS? The role of culture", The International Journal of Accountancy, Vol. 40, pp. 325-350.

Edvinsson, L. (2002), *Corporate Longitude: What You Need To Know To Navigate The Knowledge Economy*, Financial Times Prentice Hall, London.

Goh, P. and Lim, K. (2004), "Disclosing intellectual capital in company annual reports: evidence from Malaysia", *Journal of Intellectual Capital,* Vol. 5, No. 3, pp. 500-510.

Gray, S. (1988), "Towards a theory of cultural influence on the development of accounting systems internationally", *Abacus*, Vol. 24, No. 1, pp. 1-15.

Gudergan, S. (2007), "Effect of culture on social capital and innovation", *International Journal of Knowledge, Culture & Change Management*, Vol. 5, No. 11, pp. 11-14.

Gudergan, S.P; and Soo, C. (2001), "Cultural impact on Intellectual Capital and Innovation", *Proceedings of Eighth Cross-Cultural Research Conference*, Scott Smith, ed. http://www.crossculturalresearch.com/ccr_website/proceedings01/papers\Gudergan-Soo.doc

Guthrie, J. and Petty, R. (2000), "Intellectual capital: Australian annual reporting practices", *Journal of Intellectual Capital*, Vol. 1, No. 3, pp. 241-251.

Guthrie, J., Petty, R. and Ricceri, F. (2006), "The voluntary reporting of intellectual capital: comparing evidence from Hong Kong and Australia", *Journal of Intellectual Capital*, Vol. 7, No. 2, pp. 254-271.

Herremans, I. and Isaac, R. (2007), "Relationships among intellectual capital, uncertain knowledge, and culture", *Global Journal of Business Research*, Vol. 1, No. 1, pp 24-35.

Hofstede, G., Hofstede, G. and Minkov, M. (2010), *Cultures and Organizations: Software of the Mind, 3rd Ed.*, McGraw-Hill, New York, NY.

Holmen, J., (2011), "Using intellectual capital disclosure as a framework for nonfinancial disclosures: the Danish experience", *Academy of Accounting and Financial Studies Journal,* Vol. 15, No.4, pp. 141-154.

Hope, O-K., (2003), "Firm-Level Disclosures and the Relative Roles of Culture and Legal Origin", *Journal of International Financial Management and Accounting,* Vol. 14, No. 3, pp. 218-248.

Jaggi, B. and Low, P., (2000), "Impact of Culture, Market Forces, and Legal System on Financial Disclosures", *The International Journal of Accounting,* Vol. 35, No. 4, pp. 495-519.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A. and Vishny, R. (1997), "Legal Determinants of External Finance", *The Journal of Finance,* Vol. 52, No. 3, pp. 1131-1150.

MacArthur, J. (2006), "Cultural influences on German versus U.S. management accounting practices", *Management Accounting Quarterly*, Vol. 7, No. 2, pp. 10-16.

Oliveira, L., Rodrigues, L. and Craig, R. (2006), "Firm-specific determinants of intangibles reporting: evidence from the Portuguese stock market", *Journal of Human Resource Costing & Accounting*, Vol. 10, No. 1, pp. 11-33.

Oliveras, E., Gowthorpe, C., Kasperskaya, Y. and Perramon, J. (2008), "Reporting intellectual capital in Spain", *Corporate Communications: An International Journal*, Vol. 13, No. 2, pp. 168-181.

Rimmel, G., Nielsen, C. and Yosano, T. (2009), "Intellectual capital disclosures in Japanese IPO prospectuses", *Journal of Human Resource Costing & Accounting*, Vol. 13, No. 4, pp. 316-337.

Schneider, A., and Samkin, G., (2008), "Intellectual capital reporting by the New Zealand local government sector", *Journal of Intellectual Capital,* Vol. 9, No. 3, pp. 456-486.

Singh, I. and Van der Zahn, J.-L. (2007), "Does intellectual capital disclosure reduce an IPO's cost of capital? The case of underpricing", *Journal of Intellectual Capital*, Vol. 8, No. 3, pp. 494-516.

Singh, S. and Kansal, M. (2011), "Voluntary disclosures of intellectual capital: An empirical analysis", *Journal of Intellectual Capital,* Vol. 12, No. 2, pp. 301-318

Sonnier, B. (2008), "Intellectual capital disclosure: high-tech versus traditional sector companies", *Journal of Intellectual Capital*, Vol. 9, No. 4, pp. 705-722.

Sonnier, B., Carson, K. and Carson, P. (2008), "Intellectual capital disclosure by traditional US companies: a longitudinal assessment", *Journal of Accounting & Organizational Change*, Vol. 4, No. 1, pp. 67-80.

Steenkamp, N., (2007), "Intellectual capital reporting in New Zealand: refining content analysis as a research method", unpublished PhD Thesis, Auckland University of Technology.

Stewart, T. (2001), *The Wealth of Knowledge: Intellectual Capital and the Twenty-First Century Organization*, Currency Doubleday, New York, NY.

Sujan, A. and Abeysekera, I. (2007), "Intellectual capital reporting practices of the top Australian firms", *Australian Accounting Review*, Vol. 17, No. 2, pp. 71-83.

Sveiby, K. (1997), *The New Organizational Wealth: Managing and Measuring Knowledge-Based Assets*, Berret-Koehler, San Francisco, CA.

Vandemaele, S., Vergauwen, P. and Smits, A. (2005), "Intellectual capital disclosure in The Netherlands, Sweden and the UK, a longitudinal and comparative study", *Journal of Intellectual Capital,* Vol. 6, No. 3, pp. 417-426.

Whiting, R. and Miller, J. (2008), "Voluntary disclosure of intellectual capital in New Zealand annual reports and the 'Hidden value'", *Journal of Human Resource Costing & Accounting*, Vol. 12, No. 1, pp. 26-50.

Yau, F., Chun, L. and Balaraman, R. (2009), "Intellectual capital reporting and corporate characteristics of public-listed companies in Malaysia", *Journal of Financial Reporting & Accounting*, Vol. 7, No. 1, pp. 17-35.

Yi, A., and Davey, H. (2010), "Intellectual capital disclosure in Chinese (mainland) companies", *Journal of Intellectual Capital,* Vol. 11, No. 3, pp. 326-347.

Earnings Attributes and the Properties of Analysts' Forecasts:
A Comparison among Firms Reporting under IFRS, US GAAP and Non-US Local Standards

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ABSTRACT

The purpose of this paper is to explore the association between earnings attributes and the properties of analysts' earnings forecasts for firms reporting under different accounting standards. Financial analysts are sophisticated market participants for whom firms' historical financial statements are important inputs. For that reason, the association between the properties of analysts' forecasts (accuracy and dispersion) and the attributes of earnings numbers (persistence, predictability and smoothness) might provide additional evidence on the value and informativeness of different accounting standards. My results show that the association between earnings attributes (especially predictability) and the accuracy and dispersion of analysts' earnings forecasts is stronger for firms reporting under IFRS compared to firms reporting under US GAAP or other domestic accounting standards. In addition, these results are stronger for firms incorporated in countries with high levels of legal enforcement, which is consistent with previous findings on the impact of a country's legal enforcements levels on the implementation of IFRS.

Keywords: *Accounting standard; analysts' forecast; earnings attributes; Legal enforcement*

INTRODUCTION

Financial statements are one of the main sources of information in capital markets. Accordingly, previous literature finds that sell-side analysts use the information contained in firms' financial statements to issue earnings forecasts, stock price targets, and stock recommendations (Byard and Cebenoyan, 2007; Lang and Lundholm, 1996; Lev and Thiagarajan, 1993). Financial analysts are information intermediaries who obtain, process, and disseminate firm, industry, and market information. As a result, analysts' forecasts might reflect the overall quality and value of the firms' historic accounting information. The purpose of this paper is to study and compare the association of earnings attributes and the accuracy and dispersion of analysts' earnings forecasts for firms that report accounting information under the International Financial Reporting Standards (IFRS), US Generally Accepted Accounting Standards (US GAAP), and non-US Domestic Accounting Standards (ODAS).

The main goal of the implementation of the IFRS is to "ensure a high degree of transparency and comparability of financial statements and hence ensure an efficient functioning of the Community capital market and of the Internal Market" (European Community Regulation No. 1606/2002). Several studies analyze the impact of the adoption of these standards in the capital markets (see Pope and McLeay, 2011 for a summary). They find that the quality of firms' earnings and financial disclosures, and the accuracy of analysts' earnings forecasts improve after the implementation of the IFRS in European countries (Ashbaugh and Pincus, 2001; Barth, Landsman, and Lang 2008; Brown, Preiato, and

Tarca, 2009). Sell-side analysts are key users of financial information, and therefore, they are particularly well-suited to evaluate the informativeness and value of alternative accounting standards. If analysts find that financial statements reported under IFRS are more informative about future firm performance (because of the level of homogeneity, quality of disclosure, and transparency of the financial statements), I expect to observe a stronger association between the attributes of earnings (persistence, predictability, and smoothness) and the characteristics of analysts' earnings forecasts (accuracy and dispersion) for firms reporting under these standards. In addition, prior studies find that the implementation of the IFRS depends on the legal enforcement level of each adopting country (Li, 2010). Strong enforcement environments encourage managers to act in accordance with the new standards. For this reason, for firms reporting under IFRS, I expect that the association between earnings attributes and the accuracy and dispersion of analysts' forecasts will be stronger for firms incorporated in countries with high levels of legal enforcement.

To test the association between analysts' forecasts properties and earnings attributes for firms that report financial statements under IFRS, US GAAP, and ODAS, I collect one-quarter-ahead analysts' earnings forecasts from the IBES database from 2006 to 2009. I then measure two properties of these forecasts: accuracy and dispersion. Following the methodology of Francis, LaFond, Olsson, and Schipper (2004), I use quarterly accounting data from Compustat Industrial and Compustat Global to calculate three earnings characteristics: earnings persistence, predictability, and smoothness. Then, I estimate a linear regression of analysts' earnings forecasts characteristics on these three earnings attributes, as well as other control variables, for groups of firms that report financial statements under one of the three accounting standards. Consistent with previous research, I find that desirable accounting attributes are related to more accurate and less dispersed analysts' forecasts. In addition, I find that the association between earnings predictability and the accuracy and dispersion of analysts' forecasts is stronger for firms reporting under IFRS than for firms reporting under US GAAP and ODAS. To

determine whether the country's level of legal enforcement plays a role in the association between predictability and the accuracy and dispersion of analysts' forecasts, I divide the group of firms reporting under IFRS into two categories: firms incorporated in countries with strong and weak legal enforcement systems based on the country scores of Regulatory Quality, Rule of Law and Control of Corruption (Kaufmann, Kraay, and Mastruzzi, 2009). I find that the association between predictability and accuracy and dispersion of analysts' forecasts is stronger for firms incorporated in countries with high levels of legal enforcement.

This study might be useful to researchers and regulators. Specifically, it will help researchers understand the information that analysts use in predicting earnings numbers and how accounting information and, specifically, the accounting standards under which accounting information is prepared affect these forecasted numbers. Previous research finds that the quality of information environment improves after the IFRS implementation for voluntary and mandatory adoptions (Ashbaugh and Pincus, 2001, Byard, Li and Yu, 2011). This study contributes to the literature drawing a direct link between statistical properties of firms' earnings and properties of analysts' information environment under different accounting standards. It will also help regulators understand the implications of mandatory IFRS adoption by providing evidence on its impact on the information provided by financial statements and their use by sell-side analysts. In recent years, there has been much debate about the advantages and disadvantages of the implementation of the IFRS in the US. The results show that there is a stronger association between accounting information and the products offered by sell-side analysts for firms reporting under IFRS. It might imply that analysts find financial statements reported under IFRS more informative about firms' current and future performance.

This paper proceeds as follows. Section two reviews the literature about the information that analysts use to develop forecasts and the findings on the impact of the implementation of IFRS in capital markets. It also examines the literature on earnings attributes and analysts' forecasts.

In this section, I also develop my hypotheses. Section three describes the research design and presents the sample selection procedure. Section four presents descriptive statistics of the main variables and describes the multivariate results. Section five concludes the paper.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Information used by Financial Analysts

Early studies on financial analysts try to determine what information sell-side analysts use in predicting stock prices and in forecasting accounting information, and how the quality of the information provided by firms affects the products offered by these market participants. Applying various research methodologies, several authors conclude that one of the primary sources of information that financial analysts use to develop their earnings forecasts and stock recommendations is the firm's financial statements. For example, using survey methodology, the Financial Executives Research Foundation (FERF, 1987) finds that the five most commonly used sources of information are the company annual report, SEC form 10-K, the company quarterly report, other analysts and professionals, and company management.

Other studies extensively analyze analysts' reports. For example, Previts et al. (1994), using content analysis to count words and short phrases in the text of 479 analyst reports, find that analysts base their recommendations on an evaluation of company income, emphasizing core earnings and earnings variability, and considering firms' competitive position and management strategy. Rogers and Grant (1997) studying the content of 187 sell-side analysts reports find that earnings are more important than balance sheet and cash flow statement information, and that the MD&A section of the firms' annual report is important in terms of the information cited in analysts' reports.

Several studies rely on archival data to analyze the information used by analysts. These studies find that management communication in the form of earnings guidance, annual published information, press releases, proxy statements, investor relations, and conference calls have an impact on the number of analysts following a firm, the accuracy of the analysts' earnings forecasts, and the volatility of these forecasts (Barron, Kile, and O'Keefe, 1999; Bowen, Davis, and Matsumoto 2002; Lang and Lundholm, 1996; Williams, 1996). Hope (2003), analyzing an international sample, concludes that the quality of the annual reports, measured by the Center for International Financial Analysis and Research1, is negatively correlated with the dispersion and error of analysts' earnings forecasts.

The view of analysts as sophisticated information intermediaries has been challenged by recent studies that find that analysts do not use all information in past earnings, changes in earnings, working capital accruals from most recent annual reports, and all the fundamental values reported by companies in forecasting earnings numbers (Abarbanell and Bushee, 1997; and Bradshaw, Richardson, and Sloan, 2001). In addition, it seems that analysts do not incorporate their own earnings forecasts into their stock recommendations (Bradshaw, 2004; and Ke and Yu, 2009). Thus, there is still uncertainty about what information financial analysts use and how the characteristics of this information affect the products they offer to market participants. Also, there is little evidence on how the quality of accounting numbers reported under different accounting standards are associated with the accuracy and dispersion of analysts' earnings forecasts.

Earnings Attributes

The accounting literature identifies several desired earnings attributes that have an impact on capital markets (Francis et al. 2004). These attributes include persistence, predictability and smoothness. These values are usually calculated using only accounting information. Persistence in earnings is viewed as a measure of the sustainability of a firm's earnings. Persistent earnings numbers might be perceived by investors and analysts as more permanent and thus less transitory, which would be more useful for analysts given that they usually rely on ratios, such as price to earnings, to map their forecasts in stock recommendations (Bradshaw, 2004). As recognized by Shipper and Vincent (2003), earnings

persistence is a function of the accounting standards, the reporting business model, the operating environment and management discretion. Even when management cannot exercise discretion over reported earnings, they can exercise discretion over firms' disclosure quality, possibly making it more difficult for investors and analysts to understand the implications of current earnings for future performance. For example, Li (2008) finds that the profits of firms with annual reports that are easier to read are more persistent.

The FASB Concepts Statements No. 2 includes predictability as a relevant element, which is defined as the ability of earnings to predict future earnings. This characteristic seems to be valued by market participants, especially financial analysts who forecast earnings and stock prices and make stock recommendations. Firms with less predictable earnings have a higher information asymmetry and enjoy a higher cost of equity and debt. Affleck-Graves, Callahan, and Chipalkatti (2002) provide evidence that the cost of equity capital is lower for NASDAQ stocks with higher earnings predictability than for firms with lower earnings predictability. Crabtree and Maher (2005) find that firms' earnings predictability is significantly negatively associated with the offering yield of the firm's debt issues and positively associated with its bond ratings.

Smoothness is another desirable property of earnings. Graham, Harvey, and Rajgopal (2005) find that the vast majority of CFOs prefer to report smooth earnings and to hold cash flows constant because of the perception of lower risk, the lower cost of equity and debt, and the improved predictability of earnings by analysts. Francis et al. (2004) argue that managers might use their private information about the future to smooth out transitory components of earnings and therefore achieve more useful earnings numbers. However, managers can use their discretion and make earnings numbers noisier in their attempt to smooth them. Looking for some empirical evidence on this issue, Tucker and Zarowin (2006) find that income smoothing improves the informativeness of past and current earnings about future earnings. Consequently, analysts might find earnings smoothing helpful in forecasting accounting numbers.

Given that earnings values are inputs in the analysts' production process, earnings characteristics might have an impact on the properties of analysts' final outcomes, namely the accuracy and dispersion of their earnings forecasts. In addition, financial analysts might help us understand the value of earnings numbers reported under different accounting standards.

Analysts' Earnings Forecast Properties And Their Relation With Earnings Attributes

Financial analysts are viewed as a sophisticated group of market participants who process all available information in order to forecast accounting data and to offer stock price targets and stock recommendations. Several papers analyze the determinants of the accuracy and dispersion of earnings forecasts. For example, Lang and Lundholm (1996) find that analysts' forecasts are more accurate, less dispersed, and exhibit less volatile revisions for larger firms and for firms with small earnings surprises. Hwang, Jan, and Basu (1996) find that analysts' earnings forecasts are less accurate for loss-reporting firms. Forecast dispersion is usually used as a proxy for investors' uncertainty. The literature finds that analysts' earnings forecast dispersion decreases following earnings announcements and that it increases following the implementation of the Fair Disclosure Regulation in 2000 (Bailey, Li, Mao and Zhong, 2003). There is also evidence that audit quality affects the accuracy and volatility of analysts' short-term earnings forecasts. Behn, Choi, and Kang (2008) report higher accuracy and lower volatility of one-year-ahead analysts' earnings forecasts for firms audited by the Big 5 audit firms. They argue that the quality of financial information has a positive impact on the quality of analysts' forecasts.

Several studies examine the impact of individual earnings characteristics on the accuracy of analysts' earnings forecasts. Kross, Ro, and Schroeder (1990) report that the accuracy of analysts' earnings forecasts is inversely related to earnings volatility. Eames and Glover (2003) document a positive association between earnings levels and both forecast errors and earnings predictability. Reinforcing the finding of Sloan (1996) that investors fail to recognize the implication of cash

flow and accruals for future earnings, Bradshaw et al. (2001) find that analysts' earnings forecast errors are negatively related to the magnitude of accruals. They suggest that accrual quality affects the accuracy of earnings forecasts because analysts do not fully understand the decline in earnings associated with higher levels of accruals. Taken together, the literature documents that earnings attributes have an impact on the properties of analysts' forecasts. Analysts' forecasting ability increases with the quality of financial information they use to predict future earnings, which might help us understand the value and informativeness of different accounting standards. The more the historical earnings information contains desirable earnings attributes, the more likely it is that analysts will issue accurate forecasts. Moreover, the more the historical earnings information contains desirable earnings attributes, the less likely it is that analysts will diverge in their opinion about future earnings.

The impact of the implementation of IFRS on capital markets

On July 19, 2002, the European Union (EU) parliament passed a regulation that requires all companies listed in the EU, beginning on January 1, 2005, to report financial statements under IFRS. The main purpose of the implementation of IFRS in Europe was to promote transparency and comparability, thus improving the overall quality of the firms' financial information. Several studies have analyzed the changes in the quality of financial reporting and the capital market consequences after the implementation of IFRS. Barth et al. (2008), based on inferences on a sample of firms in 21 countries that voluntarily reported under the International Accounting Standards (IAS)2 between 1993 and 2003, find that those firms display less earnings smoothing, less earnings managing toward targets, more timely loss recognition, and more relevant accounting numbers, compared to matching non-US firms. Li (2010) finds that after the mandatory adoption of IFRS in 2005, mandatory adopters show a significant reduction in their cost of equity. The author identifies two channels through which mandatory adoption reduces the cost of capital: enhanced disclosure

and enhanced comparability, consistent with the arguments used by the proponents of IFRS.

Several authors have studied the impact of the voluntary and mandatory adoption of IFRS on financial analysts. Hope (2003) finds that analysts' forecast accuracy is positively related to the level of annual report disclosure for firms in more than 23 countries, and this relation is especially strong in countries with high levels of law enforcement. Ashbaugh and Pincus (2001) investigate the impact of the differences in countries' accounting standards on the analysts' earnings forecasts accuracy by studying a sample of voluntary IFRS adopters before and after they adopted IAS. They find a decrease in analysts' earnings forecast errors after the adoption of IAS. They conclude that the financial information became more predictable after the adoption of IAS. In a similar spirit, Brown et al. (2009) find that the dispersion of analysts' earnings forecasts declined since the mandatory adoption of IFRS in the European Union. They conclude that their finding supports the idea of an increase in the overall quality of financial reporting following the adoption of IFRS.

IFRS are viewed as more principle-based accounting standards, in contrast to many local standards (including the US GAAP) that are rule-based systems (Leone, 2008). As discussed by Atwood, Drake, Myers, and Myers (2010), if managers use the increased reporting flexibility under IFRS to convey private information and if the quality and comparability of financial statements are greater for firms reporting under IFRS, sell-side analysts might find their financial statements more informative about future cash flows. Consequently, I expect to observe a stronger association between earnings attributes and the accuracy of analysts' earnings forecasts. In addition, if the introduction of the IFRS improves the overall quality of financial information and reduces information asymmetries, I expect to observe a more pronounced association between analysts' earnings forecast dispersion and earnings attributes for the set of firms reporting under IFRS. Therefore, my first two hypotheses are stated as follows:

> Hypothesis 1: Firms with higher quality earnings attributes (more earnings persistence, more smoothness, and

more predictability) have more accurate analysts' earnings forecasts. The association is stronger for firms reporting under IFRS than for firms reporting under US GAAP or ODAS.

- Hypothesis 2: Firms with higher quality earnings attributes (more earnings persistence, more smoothness, and more predictability) have less dispersed analysts' earnings forecasts. The association is stronger for firms reporting under IFRS than for firms reporting under US GAAP or ODAS.

Several studies find that the impact of the implementation of IFRS depends on the country's institutional quality (Ball, Robin and Wu, 2003 and Li 2010) and not only on the quality of the accounting standards. This pattern suggests that, for firms reporting under IFRS, the association between earnings attributes and the properties of analysts' earnings forecasts would be stronger (or only evident) in countries with high levels of legal enforcement.

Hypothesis 3. For firms reporting under IFRS, the association between earnings attributes and the accuracy and dispersion of analysts' earnings forecasts is stronger in countries with high levels of legal enforcement.

RESEARCH DESIGN AND SAMPLE SELECTION

Earnings Attributes Measures

I use measures developed in previous studies to calculate all three earnings attributes. Following Francis et al. (2004), I measure earnings persistence as the slope coefficient of an autoregressive time series model of earnings of order one (AR1):

$$EBIX_{it} = \beta 0t + \beta 1t \, EBIXit\text{-}4 + \upsilon_{it} \quad (1)$$

Where

EBIX$_{it}$ = Firm i's earnings before extraordinary items in quarter t.

EBIXit-4 = Firm i's earnings before extraordinary items in quarter t-4.

Both values are scaled by the firm's market value at quarter t-4.

For each firm-quarter observation in my sample, I estimate Equation (1) using a rolling twelve-quarter window.3 The estimated coefficient β1t is my measure of earnings persistence:

$$Persistence_{it} = \beta 1t. \quad (2)$$

Values closer to 0 indicate less persistence in the time series of the firm's earnings, and values closer to 1 indicate highly persistent earnings.

Using Equation (1) and based on Lipe (1990), I define the earnings predictability as the negative value of the standard deviation of firm-quarter specific residuals over twelve quarters.

$$Predictability_{it} = -SD \, (\upsilon i \; time), time = t\text{-}12, t\text{-}11,..., t. \quad (3)$$

I multiply the value of predictability by -1 so that more positive values of predictability$_{it}$ imply more predictable earnings.

Based on Leuz et al. (2003), I calculate, using a rolling twelve-quarter window, earnings smoothness as the negative value of firm i's standard deviation of net income before extraordinary items (divided by the firm's market value at the beginning of the period) divided by the standard deviation of cash flow from operations (divided by the firm's market value at the beginning of the period).

$$Smoothness_{it} = -SD \, (EBIX_{i \, time}) \, / \, SD \, (CFO_{i \, time}) \, ; \\ time = t\text{-}12, t-11, ... , t \quad (4)$$

Where:

EBIX$_{it}$ = Firm i's earnings before extraordinary items in quarter t.

CFO$_{it}$ = Firm i's cash flow from operations items in quarter t.

Both values are scaled by the firm's market value at quarter t-4. I multiply the value of smoothness by -1 so that larger values of smoothness$_{it}$ imply smoother earnings.

Analysts forecast properties

I also follow the previous literature in measuring the properties of analysts' forecasts. I mea-

sure the analysts' accuracy as the negative value of the absolute forecast error:

$$Accuracy_{it} = -| Actual_{it} - Forecast_{it} | / Price_{it} \quad (5)$$

Where:

Actual$_{it}$ = Firm i's actual value of earnings per share in quarter t.

Forecast$_{it}$ = the consensus (median) forecast value of earnings per share for firm i in quarter t.

I scale the accuracy measure by the stock price at the end of the period. I define the analysts' forecast dispersion as the negative value of the standard deviation of all analysts' earnings per share forecasts issued for firm i in quarter t:

$$Dispersion_{it} = - SD (Forecasts_{it}) / Price_{it} \quad (6)$$

I multiply the forecast characteristics by negative one so that more positive values indicate that the analysts' forecasts are more accurate and less dispersed.

To test whether earnings attributes are associated with the properties of analysts' earnings forecasts under IFRS, US GAPP and ODAS, I estimate the coefficients of the following two equations using OLS regression for each group separately4:

$$Accuracy_{it} = \alpha0 + \alpha1\ Attribute_{it} + \alpha2\ Horizon_{it} + \alpha3\ Num\_A_{it} + \alpha4\ Loss_{it} + \alpha5\ Size_{it} + \varepsilon_{it} \quad (7)$$

$$Dispersion_{it} = \beta0 + \beta1\ Attribute_{it} + \beta3\ Std\_Horizon_{it} + \beta2\ Size_{it} + \beta4\ Loss_{it} + \varepsilon it \quad (8)$$

where

Attribute$_{it}$ = { Persistence$_{it}$, Predictability$_{it}$, Smoothness$_{it}$ }

Num_A$_{it}$ = Number of analysts issuing a forecast for firm i in quarter t.

Horizon$_{it}$ = Average number of calendar days between the forecast announcement date and subsequent earnings announcement for all analysts' forecasts.

Std_horizon$_{it}$ = Standard deviation of the number of calendar days between the forecast announcement date and the next earnings announcement for all analysts' forecasts.

Size$_{it}$ = logarithm of firm i's total assets in quarter t.

Loss$_{it}$ = 1 if firm i reports a loss in quarter t, 0 otherwise.

I control for the firm size, the average horizon of the forecasts, the number of analysts following the firm, and whether the firm reports a loss or not. Lang and Lundholm (1996) find that larger firms and firms with more analysts following them have more accurate analysts' forecasts. Therefore, I include size, measured as the logarithm of the total assets, and Num_A, measured as the number of analysts issuing a forecast for the firm, as control variables. Brown (2001) finds that forecasts announced closer to the actual earnings announcement date are more accurate than forecasts issued earlier. For that reason, I include the average number of calendar days between the forecast announcement date and the next earnings announcement date. Hwang et al. (1996) find that analysts' forecasts for firms with losses are less accurate. In consequence, I include a dummy variable (Loss), which takes the value of 1 if the firm-quarter observation corresponds to a firm reporting losses in quarter t. I include country and year fixed effects to control for possible country and time differences that might affect the association between earnings attributes and analysts' forecast properties.

To test whether the country's enforcement level impacts the association between earnings attributes and the properties of analysts' earnings forecasts for firms reporting under IFRS, I divided this group of firms into two subsamples, firms incorporated in countries with high and low levels of legal enforcement based on the scores of Rule of Law, Control of Corruption, and Regulatory Quality computed by the World Bank (Kaufman et al. 2009). The results are qualitatively similar if I use the average score of the efficiency of the Judicial System, Rule of Law, and Corruption from La Porta (1998). Kaufman et al. (2009) define Regulatory Quality as a variable "capturing perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development." Rule of Law is defined as a variable "capturing perceptions of the extent to which agents have

confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence." Control of Corruption is defined as a variable "capturing perceptions of the extent to which public power is exercise for private gain, including both petty and grand forms of corruption, as well as capture of the state by elites and private interests." The indicators are based on several hundred individual variables drawn from 35 separate data sources constructed by 33 different organizations around the world.

I rerun models 7 and 8 for the two subsamples. If the association between earnings attributes and the properties of analysts' forecasts is stronger for firms in countries with high levels of enforcement, I expect that the coefficients $\alpha 1$ and $\beta 1$ will be more positive for firms in countries with high levels of legal enforcement. The countries in the high enforcement group are Finland, Denmark, Luxembourg, Norway, the Netherlands, the Czech Republic, Austria and Sweden. The countries in the low enforcement group are Poland, Italy, Greece, Portugal, Spain, France, Belgium, and Hungary. Germany and Great Britain are in the middle of the classification list, so I delete all firms incorporated in these countries.

Sample selection

I select all firms with at least one-quarter-ahead analysts' earnings forecasts, from 2006 to 2009, from IBES database. I impose the following restrictions: i) all firms must have sufficient accounting data from Compustat Industrial/Commercial and Compustat Global to calculate earnings attributes; ii) the forecast must be issued at least 90 days before the earnings announcement date; and iii) I delete all observations that changed accounting standard during the sample period. Following Daske, Heil, Leuz and Verdi (2009), I classify a firm as part of the IFRS group if its accounting standard code in Compustat Global is DI, DA or DT. All US firms in the Compustat Industrial/Commercial file are classified in the US GAAP group. I classified a firm as part of the ODAS group if its accounting standard code is DD, DO, DS, DR or MI in Compustat Global.

Panel A of Table 1 presents the sample distribution by year and accounting standard group. The final sample consists of 4,944 firm-quarter observations reporting under IFRS, 28,460 firm-quarter observations reporting under US GAAP and 1,658 firm-quarter observations re-

TABLE 1 SAMPLE DISTRIBUTION BY YEAR, ACCOUNTING STANDARD AND COUNTRY OF INCORPORATION			
Panel A: Distribution of the observations by year and accounting standard			
	Observations under		
Year	**IFRS**	**US GAAP**	**ODAS**
2006	199	7,418	115
2007	1,399	7,434	422
2008	1,788	7,526	500
2009	1,558	6,082	532
Total	4,944	28,460	1,658
Panel B: Distribution of the observations by country			
IFRS sample		**ODAS sample**	
Country	**N**	**Country**	**N**
AUT	116	BRA	402
BEL	92	CHL	25
CHE	93	CHN	377
DEU	1,046	IDN	144
DNK	218	IND	112
ESP	252	MEX	206
FIN	797	MYS	41
FRA	112	PHL	27
GBR	178	SGP	119
GRC	91	THA	205
HUN	27	Total	1,658
ITA	153		
LUX	32		
NLD	163		
NOR	605		
POL	26		
PRT	61		
SWE	882		
Total	4,944		

TABLE 2					
DESCRIPTIVE STATISTICS BY ACCOUNTING STANDARD					
Panel A: Firms reporting under US GAAP					
Variable	**1st Quartile**	**Mean**	**Median**	**3rd Quartile**	**Std Dev**
Persistence	-0.043	0.375	0.316	0.835	0.733
Predictability	-0.242	-0.267	-0.109	-0.482	0.495
Smoothness	-0.683	-0.485	-0.403	-0.232	0.321
Accuracy	-0.006	-0.009	-0.002	0.001	0.023
Dispersion	-0.003	-0.004	-0.001	0.001	0.007
Size	5.539	6.774	6.708	7.903	1.773
Loss	0.000	0.281	0.000	1.000	0.448
Panel B: Firms reporting under IFRS					
Variable	**1st Quartile**	**Mean**	**Median**	**3rd Quartile**	**Std Dev**
Persistence	-0.049	0.359	0.339	0.806	0.695
Predictability	-0.022	-0.194	-0.119	-0.510	0.024
Smoothness	-0.434	-0.312	-0.230	-0.118	0.257
Accuracy	-0.011	-0.020	-0.003	-0.001	0.063
Dispersion	-0.007	-0.011	-0.003	-0.001	0.032
Size	6.156	7.576	7.572	9.038	2.042
Loss	0.000	0.209	0.000	0.000	0.407
Panel C: Firms reporting under ODAS					
Variable	**1st Quartile**	**Mean**	**Median**	**3rd Quartile**	**Std Dev**
Persistence	0.063	0.506	0.485	0.941	0.674
Predictability	-0.175	-0.157	-0.189	-0.433	0.214
Smoothness	-0.472	-0.337	-0.283	-0.142	0.247
Accuracy	-0.008	-0.013	-0.003	-0.001	0.032
Dispersion	-0.005	-0.012	-0.003	-0.001	0.056
Size	8.554	10.358	9.613	11.325	2.665
Loss	0.0000	0.084	0.000	0.000	0.278

Panel D: Test of the Differences in Mean Values

	IFRS vs. US GAAP				IFRS vs. ODAS				US GAAP vs. ODAS			
	Mean Values				Mean Values				Mean Values			
	IFRS	**US GAAP**	**Diff**		**IFRS**	**ODAS**	**Diff**		**US GAAP**	**ODAS**	**Diff**	
Persistence	0.359	0.375	-0.016		0.359	0.506	-0.147	**	0.375	0.506	-0.132	***
Predictability	-0.194	-0.267	0.073	***	-0.194	-0.157	-0.037	**	-0.267	-0.157	-0.110	**
Smoothness	-0.312	-0.485	0.173	***	-0.312	-0.337	0.025	*	-0.485	-0.337	-0.148	**
Accuracy	-0.020	-0.009	-0.011	***	-0.020	-0.013	-0.007	***	-0.009	-0.013	0.004	*
Dispersion	-0.012	-0.004	-0.008	***	-0.012	-0.013	0.001		-0.004	-0.013	0.009	**

***, **, and * denote significance at 1%, 5% and 10% respectively

TABLE 3 — CORRELATION MATRIX					
Panel A: Firms reporting under US GAAP					
	Persistence	**Predictability**	**Smoothness**	**Accuracy**	**Dispersion**
Persistence	1.00	0.11	0.01	-0.01	0.02
Predictability		1.00	0.34	0.14	0.17
Smoothness			1.00	0.06	0.08
Accuracy				1.00	0.66
Dispersion					1.00
Panel B: Firms reporting under IFRS					
	Persistence	**Predictability**	**Smoothness**	**Accuracy**	**Dispersion**
Persistence	1.00	0.13	0.15	0.01	0.04
Predictability		1.00	0.34	0.18	0.22
Smoothness			1.00	0.18	0.20
Accuracy				1.00	0.64
Dispersion					1.00
Panel C: Firms reporting under ODAS					
	Persistence	**Predictability**	**Smoothness**	**Accuracy**	**Dispersion**
Persistence	1.00	0.20	-0.04	0.02	0.03
Predictability		1.00	0.37	0.18	0.06
Smoothness			1.00	0.03	0.01
Accuracy				1.00	0.64
Dispersion					1.00

porting under ODAS. Panel B of Table 1 presents the distribution of the IFRS and ODAS samples by country.

Almost half of the observations in the IFRS group are from Germany, Finland, Norway and Sweden. Brazil and China are the countries with the most observations in the ODAS group.

DESCRIPTIVE STATISTICS AND RESULTS

Table 2 presents the descriptive statistics by group. Panel A presents the results for the US GAAP group, Panel B presents the results for the IFRS group and Panel C presents the results for the ODAS group. The mean values of persistence, predictability and smoothness are 0.375,

-0.267 and -0.485 for the US GAAP group, 0.359, -0.194 and -0.312 for the IFRS group and 0.506, -0.157 and -0.337 for the ODAS group, respectively.[5] Panel D presents the test of statistical differences in the mean values. There is evidence that earnings are equally persistent under IFRS and US GAAP, consistent with the findings of Atwood et al. (2010), but it seems that earnings are more persistent under ODAS than under IFRS. There is also evidence that earnings are more predictable and smoother for firms reporting under IFRS than those reporting under US GAAP.

To obtain some initial evidence about the association between earnings attributes and the accuracy and dispersion of analysts' earnings forecasts, Table 3 presents the Pearson correlation

TABLE 4
REGRESSION RESULTS ON THE JOINTLY IMPACT OF EARNINGS ATTRIBUTE ON EARNINGS FORECAST ACCURACY BY ACCOUNTING STANDARD

Panel A

	IFRS			US GAAP			ODAS		
	Coeff	**t-statistic**		**Coeff**	**t-statistic**		**Coeff**	**t-statistic**	
Intercept	-0.035	-3.47	***	-0.024	- 7.74	***	-0.018	-2.54	**
Persistence	0.036	1.52	*	-0.004	-1.17		0.007	0.34	
Predictability	0.423	5.17	***	0.092	8.00	***	0.255	2.62	***
Smoothness	-0.005	- 0.93		0.002	2.94	***	0.002	0.43	
Horizon	-0.001	-1.67	**	0.001	2.49	***	-0.001	-1.15	
Num_A	0.001	0.94		-0.001	-5.39	***	0.001	1.00	
Size	0.005	4.43	***	0.003	19.49	***	0.001	1.92	**
Loss	-0.022	-6.79	***	-0.008	-17.46	***	-0.034	-5.17	***
Country Fixed Effect	Yes			No			Yes		
Year Fix effect	Yes			Yes			Yes		
N	4,944			28,460			1,658		
Adj_R^2	0.257			0.204			0.190		

Panel B

Test of the differences

	IFRS vs. US GAPP		IFRS vs. ODAS		US GAAP vs. ODAS	
	Diff		**Diff**		**Diff**	
Predictability	0.331	***	0.168	***	-0.163	***

***, **, and * denote significance at 1%, 5% and 10% respectively, t-stat are calculated using robust standard errors clustered by firm.

matrix among the main variables in the analysis. I find that all earnings attributes are positively associated with analysts' earnings forecast accuracy and dispersion. Higher quality of earnings numbers is associated with more accurate and less dispersed analysts' forecasts under US GAAP, IFRS and ODAS. For example, the correlation between earnings predictability and forecasts' accuracy (dispersion) is 0.14 (0.17) for firms reporting under US GAAP, 0.18 (0.22) for firms reporting under IFRS and 0.18 (0.06) for the subsample of firms reporting under ODAS. The association between earnings attributes and analysts' forecast properties appears to be stronger for the IFRS subsample of firms.

In order to control for other variables that might affect earnings forecasts' accuracy, Panel A of

Table 4 presents the results of the regression of the accuracy of analysts' earnings forecasts on the properties of earnings numbers and other control variables for firms reporting under US GAAP, IFRS and ODAS. For firms reporting under IFRS, the coefficients of earnings persistence and predictability are positive and statistically significant (0.036, p-value<0.10 and 0.423, p-value<0.01, respectively). For firms reporting under US GAAP, the coefficients of earnings predictability and smoothness are positive and statistically significant (0.092, p-value<0.01, 0.002, p-value < 0.001, respectively). For firms reporting under ODAS, the coefficient of earnings predictability is positive and statistically significant (0.255, p-value<0.01). Predictability is the dominant earnings attribute in each case.

As previously documented, larger firms have more accurate earnings forecasts, and firms that report losses in the quarter present less accurate earnings forecasts. Panel B presents the test of differences on the coefficients of earnings predictability between groups. It shows that the coefficient of earnings predictability is larger for firms reporting under IFRS than for firms reporting under US GAAP or ODAS. The differences (0.331, p-value<0.001 and 0.168, p-value<0.001) are statistically significant. Analyzing the marginal effects, I find that one standard deviation increase in earnings predictability increases forecast accuracy by 0.15, 0.18 and 0.12 standard deviations for the US GAAP, IFRS and ODAS firms, respectively.

Table 5 presents the results of the regression of the dispersion of analysts' earnings forecasts on the properties of earnings numbers for firms reporting accounting information under IFRS, US GAAP and ODAS. The coefficients of

earnings predictability are positive and statistically significant (0.159, p-value<0.01, 0.032, p-value<0.01, and 0.129, p-value<0.10, respectively). Predictability is the dominant earnings attribute in each case. As expected, larger firms have less dispersed earnings forecasts, and firms that report losses in the quarter present more dispersed earnings forecasts for the three groups of firms. Panel B presents the test of differences on the coefficients of earnings predictability between groups. It shows that the association between analysts' earnings forecast dispersion and earnings predictability is stronger for firms reporting under IFRS than for firms reporting under US GAAP or ODAS. The differences in the coefficients (0.127, p-value<0.001 and 0.030, p-value<0.05) are statistically significant. In addition, the dispersion of analysts' earnings forecasts is more highly associated with earnings predictability for firms reporting under ODAS than for firms reporting under US GAAP. Analyzing the marginal effects, I find that one stan-

TABLE 5
REGRESSION RESULTS ON THE IMPACT OF EARNINGS ATTRIBUTE ON EARNINGS FORECAST DISPERSION BY ACCOUNTING STANDARD

Panel A									
	IFRS			**US GAAP**			**ODAS**		
	Coeff	**t-statistic**	**Sig.**	**Coeff**	**t-statistic**	**Sig.**	**Coeff**	**t-statistic**	**Sig.**
Intercept	-0.012	-2.06	**	-0.008	-8.31	***	0.005	1.60	
Persistence	0.003	0.35		-0.001	-0.52		0.009	1.31	
Predictability	0.159	2.43	***	0.032	7.48	***	0.129	1.68	*
Smoothness	0.001	0.31		0.001	2.74	***	0.009	0.81	
Std_Horizon	-0.001	-0.68		0.001	9.94	***	-0.001	1.22	
Size	0.002	2.95	***	0.001	17.69	***	-0.003	-0.83	
Loss	-0.015	-7.08	***	-0.004	-19.94	***	-0.044	-3.03	***
Country Fixed Effect	Yes			No			Yes		
Year Fix effect	Yes			Yes			Yes		
N	3,114			23,674			427		
Adj_R2	0.309			0.258			0.156		
Panel B: Test of the differences									
	IFRS vs. US GAPP			**IFRS vs. ODAS**			**US GAPP vs. ODAS**		
	Diff			**Diff**			**Diff**		
Predictability	0.127	***		0.030	**		-0.097	**	
***, **, and * denote significance at 1%, 5% and 10% respectively, t-stat are calculated using robust standard errors clustered by firm.									

dard deviation increase in earnings predictability increases analysts' forecast dispersion by 0.09, 0.12 and 0.07 standard deviations for the US GAAP, IFRS and ODAS firms, respectively.[6]

Overall, these results support the hypotheses that financial statements reported under IFRS provide more information about firms' future prospects and therefore, the association between the accuracy and dispersion of analysts' earnings forecasts and earnings predictability is stronger for this subset of firms.

Table 6 shows the results of the regression of the accuracy of analysts' earnings forecasts on earnings attributes for firms reporting under IFRS and incorporated in countries with high and low levels of legal enforcement. It shows that the association between earnings predictability

and analysts forecast accuracy is stronger for firms based in countries with high levels of legal enforcement (0.519, p-value<0.001 vs. 0.197, p-value<0.001). The difference in the coefficients is statistically significant.

The results of the regression of the dispersion of analysts' earnings forecasts on earnings attributes for firms reporting under IFRS and incorporated in countries with high and low levels of legal enforcement are presented in table 7. Firms incorporated in countries with high levels of legal enforcement present a stronger association between earnings predictability and dispersion of analysts' forecasts (0.238, p-value<0.001 vs. 0.158, p-value<0.001). The difference in the coefficients is statistically significant.

TABLE 6
REGRESSION RESULTS ON THE JOINT IMPACT OF EARNINGS ATTRIBUTE ON EARNINGSFORECASTACCURACYBYLEGALENFORCEMENTLEVELFORFIRMSREPORTINGUNDERIFR

Panel A						
	IFRS					
	High enforcement level			Low enforcement level		
	Coeff	t-statistic	Sig.	Coeff	t-statistic	Sig.
Intercept	-0.043	-3.12	***	-0.038	-1.92	**
Persistence	0.004	1.93	*	-0.001	-0.23	
Predictability	0.519	4.78	***	0.197	1.99	**
Smoothness	-0.011	-1.46		0.002	0.39	
Horizon	0.001	0.34		-0.001	-0.22	
Num_A	0.001	2.56	***	0.001	0.31	
Size	0.005	3.59	***	0.003	1.62	*
Loss	-0.022	-5.92	***	-0.015	-3.31	***
Country Fixed Effect	Yes			Yes		
Year Fix effect	Yes			Yes		
N	2,906			814		
Adj_R2	0.17			0.07		
Panel B: Test of the differences						
	Diff					
Predictability	0.322		***			
***, **, and * denote significance at 1%, 5% and 10% respectively, t-stat are calculated using robust standard errors clustered by firm.						

TABLE 7
REGRESSION RESULTS ON THE JOINT IMPACT OF EARNINGS ATTRIBUTE ON EARNINGS FORECAST DISPERSION BY LEGAL ENFORCEMENT LEVEL FOR FIRMS REPORTING UNDER IFRS

Panel A

	IFRS					
	High enforcement level			**Low enforcement level**		
	Coeff	**t-stat**		**Coeff**	**t-stat**	
Intercept	-0.012	-2.74	***	-0.019	-1.87	*
Persistence	0.001	0.15		0.002	0.32	
Predictability	0.238	2.99	***	0.158	3.15	***
Smoothness	-0.004	-1.05		-0.001	-0.51	
Std_Horizon	0.007	0.58		-0.003	-0.42	
Size	0.001	3.25	***	0.001	1.5	
Loss	-0.015	-6.35	***	-0.006	-2.24	**
Country Fixed Effect	Yes			Yes		
Year Fix effect	Yes			Yes		
N	2,014			373		
Adj_R^2	0.19			0.16		

Panel B: Test of the differences

	Diff		
Predictability	0.080	***	

***, **, and * denote significance at 1%, 5% and 10% respectively, t-stat are calculated using robust standard errors clustered by firm.

Overall, these results present evidence that the level of institutional quality plays an important role in the implementation of IFRS and in the association between earnings persistence and the accuracy and dispersion of analysts' forecasts.

CONCLUSIONS

This study provides additional evidence for the debate over the benefits of adopting IFRS. Because the main purpose of IFRS is to enhance earnings quality and comparability, the products of financial analysts might provide an interesting setting to test whether financial statements reported under IFRS provide more information to the market. Even though I am not able to compare the association between analysts' earnings forecasts and earnings attributes before and after the IFRS implementation for firms incorporated in Europe because of data availability, my results show that the association between earnings attributes (especially earnings predictability) and the accuracy and dispersion of analysts' earnings forecasts is stronger for firms reporting under IFRS than for firms reporting under US GAAP or ODAS. It seems that financial statements based on IFRS provide more information to an important group of market participants, sell-side analysts. Moreover, I find that, for firms reporting under IFRS, the association between earnings persistence and the properties of analysts' earnings forecasts is stronger for firms incorporated in countries with high level of legal enforcement.

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NOTES

1. The Center for International Financial Analysis and Research (CIFAR) measures, on a scale from 0 to 100, firms' disclosure *levels* based on the inclusion or exclusion of 85 annual report items and 20 accounting items.

2. For the ease of exposition, I will hereafter use "IFRS" to refer to both the International Accounting Standards (IAS) and the International Financial Reporting Standards (IFRS).

3. To compute earnings predictability, persistence and smoothness, I require all firms to have at least 10 observations in the last twelve quarters. I use data from Compustat and Compustat Global from 2003 to 2009.

4. Since my sample includes several observations per firm, I estimate t-statistics using standard errors clustered by firm.

5. To remove the influence of outliers, I winsorize all continuous variables at their 1st and 99th percentile levels.

6. I also use the Principal Component Analysis (PCA) to summarize the three earnings attributes in one variable. For each group of firms, the first principal component (PC1) explains more than 60% of the total variance observed in the three attributes. The weights assigned to earnings predictability, persistence and smoothness are 0.636, 0.418 and 0.6481 for the US group of firms, 0.718, 0.2912 and 0.631 for the IFRS group, and 0.705, 0.228 and 0.672 for the ODAS group. I include

PC1 in the models 7 and 8, instead of the three attributes, and I find that the coefficient is larger for firms reporting under IFRS than for firms reporting under US GAAP and ODAS.

REFERENCES

Abarbanell, J., and Bushee, B. 1997. Fundamental analysis, future earnings, and stock prices. Journal of Accounting Research, 35: 1–24.

Affleck-Graves, J., Callahan, C.M., and Chipalkatti, N. 2002. Earnings predictability, information asymmetry, and market liquidity. Journal of Accounting Research, 40: 561–583.

Ahmed, A., Song, M., and Stevens, D. 2009. Earnings Characteristics and Analysts' Differential Interpretation of Earnings Announcements: An empirical Analysis. Accounting and Finance, 49: 223-246.

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

Atwood T., Drake, M., Myers, J., and Myers, L. 2011. Do earnings reported under IFRS tell us more about future earnings and cash flows? Journal of Accounting and Public Policy, 30: 103 – 121.

Ball, R., Robin, A., and Wu, J. 2003. Incentives versus standards: properties of accounting income in four East Asian countries and implications for the acceptance of IAS. Journal of Accounting and Economics, 36: 235-270.

Barron, O., Kile, C., and O'Keefe, T. 1999. MD&A quality as measured by the SEC and analysts' earnings forecasts. Contemporary Accounting Research, 16: 75–109.

Barth, M. E., Landsman, W. R., and Lang, M. 2008. International Accounting Standards and Accounting Quality. Journal of Accounting Research, 46: 467-498.

Bailey, W., Li, H., Mao, C., and Zhong, R. 2003. Regulation Fair Disclosure and earnings in-

formation: Market, analyst and corporate responses. Journal of Finance, 58:2487–2514.

Behn, B., Choi, J., Kang, T. 2008. Audit Quality and Properties of Analyst Earnings Forecasts. The Accounting Review, 83: 327-349.

Bowen, R., Davis, A., and Matsumoto, D. 2002. Do conference calls affect analysts' forecasts? The Accounting Review 77: 285–316.

Brown, P., Preiato, J., Tarca, A. 2009. Mandatory IFRS and Properties of Analysts' Forecasts: How Much Does Enforcement Matter? Australian School of Business Research Paper .

Bradshaw, M., Richardson, S., and Sloan, R. 2001. Do analysts and auditors use information in accruals? Journal of Accounting Research, 39: 45–74.

Bradshaw, M. 2004. How do analysts use their earnings forecasts in generating stock recommendations? The Accounting Review, 79: 25–50.

Brown, L . 2001. A temporal analysis of earnings surprises: Profits versus losses. Journal of Accounting Research, 39:2 21-241.

Byard, D., and Cebenoyan, F. 2007. Alternative Evidence on Financial Analysts' Use of Financial Statement Information. Review of Accounting and Finance, 6: 442-459.

Byard, D., Ying, L., and Yu, Y. 2011. The effect of mandatory IFRS adoption on financial analysts' information environment. Journal of Accounting Research, 41: 69-96.

Collins, D., Maydew, E. and Weiss, I. 1997. Changes in the Value –Relevance of Earnings and Book Value over the Past Forty Years. Journal of Accounting and Economics, 24: 39-67.

Crabtree A., and Maher, J. 2005. Earnings Predictability, Bond Ratings, and Bond Yields. Review of Quantitative Finance and Accounting, 25: 233-253

Daske, H., Hail. L., Leuz, C., and Verdi, R. 2009. Adopting a Label: Heterogeneity in the Economic Consequences of IFRS Adoptions. Working Paper

Eames, M., and Glover, S. 2002. Earnings Predictability and the Direction of Analysts' Earnings Forecast Errors. The Accounting Review, 78:707-724.

Francis, J., LaFond, R., Olsson, P., and Schipper, K. 2004. Cost of Equity and Earning Attributes. The Accounting Review, 79: 967-1010.

Graham, J., Harvey, C., and Rajgopal, S. 2005. The economic implications of corporate financial reporting. Journal of Accounting and Economics, 40: 3-73.

Hope, O. 2003. Disclosure practices, enforcement of accounting standards, and analysts' forecast accuracy: An international study. Journal of Accounting Research, 41: 235–272.

Hwang, L., Jan C., and Basu, S. 1996. Loss firms and analysts' earnings forecast errors. Journal

of Financial Statement Analysis, 1: 18-3 1.

Johnson, V., Khurana, I., Reynolds, J. 2002. Audit- firm Tenure and the Quality of Financial reporting. Contemporary Accounting Research, 19: 637-660.

Kaufmann, D., Kraay, A. and Mastruzzi, M. 2009. Governance Matters V: Aggregate and Individual Governance Indicators 1996-2008. The World Bank.

Ke, B., Yu, Y. 2009 Why Don't Analysts Use Their Earnings Forecasts in Generating Stock recommendations? Working Paper.

Kross, W., Ro, B., and Schroeder, D. 1990. Earnings Expectations: The Analysts' information Advantage. The Accounting Review, 65:461-476.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., and Vishny, R. 1998. Law and finance. The Journal of Political Economy, 106: 1113-1155.

Lang, M., and Lundholm, R. 1996. Corporate disclosure policy and analyst behavior. The Accounting Review, 71: 467–492.

Leone, M., 2008. Audit firm big cite lust for global standards. CFO.com (January 16).

Lev, B., and Zarowin, P. 1999. The Boundaries of Finance Reporting and How to Extend

them. Journal of Accounting Research, 37: 353- 85.

Lev, B., and Thiagarajan, S. 1993. Fundamental Information Analysis. Journal of Accounting Research, 31: 190–215.

Li, F. 2008. Annual report readability, current earnings, and earnings persistence. Journal of Accounting and Economics, 45: 221-247.

Li, S. 2010. Does Mandatory Adoption of International Financial Reporting Standards in the European Union Reduce the Cost of Equity Capital? The Accounting Review, 85: 607 – 640.

Lipe. R. 1990- The relation between stock returns and accounting earnings given alternative information. The Accounting Review, 65: 49-71.

Leuz, C. Nanda, D., and Wysocki, P. 2003. Earnings management and investor protection: An international comparison. Journal of Financial Economics, 69: 505-527.

Pope, P. and McLeay, S. 2011. The European IFRS experiment: objectives, research challenges and some early evidence, Accounting and Business Research, 41: 233-266

Previts, G., Bricker, R., Robinson, T., and Young, S. 1994. A content analysis of sell-side financial analyst company reports. Accounting Horizons, 8: 55–70.

Rogers, R., and Grant, J. 1997. Content analysis of information cited in reports of sell-side financial analysts. Journal of Financial Statement Analysis, 3:17–30.

Schipper, K., and Vincent, L. 2003. Earnings quality. Accounting Horizons, 17(Supplement): 97-110.

Sloan, R. 1996. Do stock prices fully reflect information in accruals and cash flows about future earnings? The Accounting Review, 71: 289–315.

Tucker, J., and Zarowin, P. 2006. Does Income Smoothing Improve Earnings Informativeness? The Accounting Review, 81:251-270.

Williams, P. 1996. The relation between a prior earnings forecast by management and analyst response to a current management forecast. The Accounting Review, 71: 103–113.

Xie, H. 2001. The Mispricing of Abnormal Accruals. The Accounting Review, 76: 357- 373.

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