Cross Market Information Flows: U.S. Listed ADR Accounting Principles Choice and the Market Reaction to SEC Form 20-F

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In this study we expand our previous work (Senteney et al, 2014) using Grange Causality technique to test the SEC Form 20F information flow hypothesis. We investigate whether accounting principle choice used by ADR firms has any impact on equity security market at the time of the Form 20-F filings. We employ models of the cross-market ADR and equity security share response to the Form 20-F filing. Our results indicate that both ADR and equity security share markets respond to the Form 20-F filing and there is strong indication that the U.S. ADR share market response dominates the cross-market information flow driving the home country equity share market response. Furthermore, we find that the cross-market response to ADR Form 20-F filing is not equal across the three available accounting principle choices in either the ADR share market or the home country equity share market. Results are consistent with U.S. GAAP conveying the most of new price relevant information, and IFRS and local accounting standards being informative but not to the same extent.

INTRODUCTION

The first decade of the second millennium has witnessed historically unprecedented growth in the use of American Depository Receipts (i.e., ADRs) as a vehicle for non-U.S. firms to acquire access to U.S. equity markets[1], as well as a dramatic increase in the degree of integration of global equity as a consequence. Although it may seem that firm-specific information events (e.g., new financing, dividends, and earnings announcements) ought to arise primarily as a result of home country factors, the U.S. Securities and Exchange Commission Form 20-F[2] disclosures for Level II and III ADRs listed on the major U.S. exchanges (required for compliance with SEC disclosure requirements) provide one prominent example of high quality price relevant disclosures arising off-shore. Extant empirical research indicates that, in numerous instances, significant information flows from the U.S. stock exchanges to the home country equity share exchanges suggesting that U.S. stock exchanges play a preeminent role in the cross-market transmission of equity share price relevant information.[3] Naturally, a direct consequence of the increased interrelation of global equity markets is that the firm-specific disclosures arising in one market may prompt security return and trading volume responses in another.

The purpose of this study is to examine comparative aspects of the Form 20-F filing date cross-market ADR and equity return and trading volume reaction where in substantial cross-market pricing differentials are quickly arbitraged away by rent seeking investors and, as a result, afford an opportunity to empirically observe the cross-market transfer of information. The perceived higher quality[4] accounting disclosures required by the U.S. Securities and Exchange Commission for Level II and III ADRs listed on the major U.S. exchanges (i.e., NYSE, AMEX, and NASDAQ) ought to prompt an equity share market response proportional to the new information and, consequently, one ought to observe the rapid erosion of any accompanying pricing differentials as a result. One contribution of this study is a more focused study of cross-market information transfers by examining the ADR and equity security return and trading volume behavior surrounding the U.S. Securities and Exchange Commission Form 20-F filing date which is known to be a unique source of unsurpassed accounting disclosures providing new information vis-a-vis the equity share market for a number of U.S.-listed ADR firms. Furthermore, in contrast with prior studies, this research provides a more complete perspective of the ADR and equity market reaction to the Form 20-F filing for U.S. exchange-listed ADRs as well as the role of security returns and trading volume in cross-market information transfers analogous to Chen and Sami (2008) and Chen and Sami (2012).[5]

Foreign private issuers submitting the periodic update Form 20-F accompanied by financial statements prepared in accordance with IFRS need not include the reconciliation and components to U.S. GAAP Net Income and Shareholders Equity amounts (i.e., Item 17 or Item 18 of Form 20-F) provided that (1) the foreign private issuer unequivocally and explicitly indicates that its financial statements are in compliance with English language IFRS in an appropriate footnote accompanying the financial statements, and (2) the independent auditor's report accompanying the foreign private issuer's financial statements affirms that those financial statements are presented in accordance with English language version IFRS.[6] Considering the prominence given discussion of the comparative merits of discontinuance of the Form 20-F reconciliation, the particularly noteworthy observation is that the Form 20-F U.S. GAAP reconciliation requirement remains effective for all non-GAAP bases of accounting employed in conjunction with the Form 20-F other than English language IFRS.

The results of this study indicate that investors in both ADR and equity share markets respond to the disclosures required by the U.S. Securities and Exchange Commission Form 20-F, providing confirming evidence of ADR Form 20-F information content. In addition, this study documents significant cross-market information transfers following upon Form 20-F U.S.-GAAP disclosures via associations between U.S.-listed ADR Form20-F filing date unexpected returns and unexpected trading volume and the equity security market reaction to the ADR Form 20-F filing in the home country market. In particular, we find that cross-market information transfers are the strongest for non-U.S. firms filing the SEC Form 20-F using U.S. GAAP or home country GAAP with reconciliation to U.S. GAAP.

The balance of this paper is presented as follows. In the second section, we provide a brief discussion of the existing cross-market information transfer research as well as the literature relating to the U.S. Securities and Exchange Commission Form 20-F disclosures and the evidence regarding the securities market reaction to new information provided by the disclosures. The third section describes the sample selection process and describes the firms employed in the statistical analyses. The fourth section of the paper describes and discusses the empirical methods and hypotheses tests used. Then, we present the empirical results and accompanying robustness tests. And the conclusions of this study and suggestions for future research are presented in the final section of this paper.

Extant Research Literature and Underlying Intuition
Cross-Market Information Transfer
The focus of this research regards precisely what we ought to expect regarding the role of U.S. trading in price discovery when an entity has ADR and equity shares traded simultaneously in both the United States and its home country. More specifically, are the preeminent financial disclosures required by the Securities and Exchange Commission following upon U.S. ADR share exchange listing an important determinant of whether U.S. securities exchanges play a dominant role in equity share price discovery vis-à-vis the equity shares traded on the home country exchange? There is comparatively sparse

literature regarding price discovery for internationally cross-listed firms and the evidence addressing precisely in which domain cross-market price discovery occurs is mixed. There is some support for both the home and foreign securities markets playing important roles in price formulation processes, but there is also support for the home country securities market dominating price discovery.[7]

The degree of correspondence between non-U.S. firms cross-listing securities on U.S stock exchanges and the informativeness of the home country equity share price derives from the observation that higher levels of firm disclosure accompanying listing on U.S. exchanges tends to attract more investors hoping to profit from trading on the information. The numerous investors seeking to earn rents from the incremental disclosures accompanying non-U.S. firms listing shares on U.S. exchanges drives the competitive market processes which arbitrage away such profits as an integral part of price formation processes. The costly additional disclosures which non-U.S. firms management chooses to undertake inherent with the decision to list securities on U.S. exchanges also tends to increase investor confidence that stock transactions occur at prices formed based upon a broad and rich set of publically available information (Bailey et al. (2006)).[8]

The Securities and Exchange Commission Form 20-F filing and accompanying reconciliation to U.S. GAAP disclosures are arguably the most important source of reliable firm-specific information conveying new information beyond what is reported in accordance with home country accounting principles. This often involves with a significant cost to firm management electing preparation of the additional information required by the SEC filings.[9] Since U.S. GAAP is generally perceived by investors as constituting the standard for high-quality accounting principles globally, the SEC Form 20-F reconciling differences with U.S. GAAP earnings and equity impose important constraints on management accounting policy choices. The constraint arises as a result of the need to minimize the reconciling differences with U.S. GAAP in communicating the relative success of their prospective investment projects in order for investors to perceive the ADR as maintaining high-quality reporting practices. Quite naturally, more pronounced differences with U.S. GAAP earnings and equity raise important questions regarding earnings management practices.[10]

The analytical research results reported in a considerable body of theoretical literature regarding the impact of management disclosures upon the equity share price formation is the foundation of this research. Specifically, we make use of results reported by Fishman and Hagerty (1989) in which firms undertake costly voluntary disclosure and investors bear a cost of acquiring and interpreting the supplemental management disclosures.[11] The relevant literature indicates that information environments which are supportive of market price formation processes result in equity share prices which are informative about future events. We rely largely upon Fishman and Hagerty (1989) in conjecturing that foreign firms are willing to commit to costly higher disclosure standards in order to improve the informativeness of share prices vis-a-vis future cash flows and resource allocation efficiency.

U.S.-listed ADR management's commitment to an increased level of disclosure for U.S. cross-listing can have the effect of increasing the incentives for informed market participants to collect and trade on private information, and, as a result, improve a U.S. listed ADR's information environment and stock price formation process. This intuition suggests that a U.S.-listed ADR's home information environment may be augmented by the additional disclosures which firm management commits to as a result of exchange required compliance with SEC regulations and U.S. GAAP. To date, however, there is limited direct evidence on the feedback relation between a U.S. listed ADR's disclosures and the equity information environment.[12]

U.S. ADR SEC Form 20-F Disclosures

The U.S. Securities and Exchange Commission (SEC) Final Rule No.33-8879 eliminating the Form 20-F reconciliation to U.S. Generally Accepted Accounting Principles (GAAP) requirement became effective March 4, 2008 for foreign private issuers[13] presenting financial statements prepared in accordance with English language version International Financial Reporting Standards (IFRS) as promulgated by the International Accounting Standards Board (IASB)with their periodic filings.[14] Although the Financial Reporting Policy Committee of the American Accounting Association asserts that

the SEC Form 20-F Items 17 and 18 U.S. GAAP reconciliation conveys important price relevant information to securities market investors which will impose an additional information cost upon investors when eliminated[15], the Financial Reporting Standards Committee of the American Accounting Association believes IFRS (i.e., without Form 20-F reconciliation) to be of sufficiently similar quality to warrant coexistence in tandem with U.S. GAAP as the single most important source of reliable (i.e., audited) company specific information available to U.S. investors at no cost via the SEC annual Form 10-K (Form 20-F) filing requirement.[16] The Securities and Exchange Commission considers the additional opportunities for international diversification investment risk reduction provided U.S. investors as a result making listing on U.S. stock exchanges more attractive to non U.S. firms by reducing the costs associated with SEC periodic filings (i.e., absent the Form 20-F reconciliation requirement) well worth additional information costs (i.e., if any) borne by investors as a result of discontinuing the Form 20-F reconciliation for IASB IFRS foreign private issuers.[17]

However, the nature and magnitude of the related costs and benefits to both investors in U.S. securities markets and non U.S firms seeking access to U.S equity markets remain unsatisfactorily answered questions.[18] Furthermore, broader policy related questions regarding the manner in which the costs and benefits associated with discontinuance of the Form 20-F reconciliation ought to be balanced between the interests of U.S. investors and those of non U.S. firms seeking access to U.S. securities markets remain in need of further discussion and debate. For example, the extant literature provides no conclusive evidence regarding (1) the increased information costs arising from discontinuing the Form 20-F reconciliation for IASB IFRS foreign private issuers or (2) the additional international diversification benefits becoming available to U.S. investors as a result of increased numbers of non U.S. firms listing on U.S. stock exchanges subsequent to discontinuing the Form 20-F reconciliation requirement. Furthermore, the existing research literature provides little evidence regarding the nature and magnitude of the costs borne by non U.S. firms in complying with the Form 20-F reconciliation or the benefits accruing to non U.S. firms as a result of having increased (less costly) access to U.S. securities markets.

Yet, these are the kinds of costs and benefits which the SEC is seeking to balance in arriving at its decision regarding discontinuance of the Form 20-F reconciliation. Furthermore, the SEC decision to discontinue the Form 20-F reconciliation is not uncontroversial. As mentioned previously, the American Accounting Association Financial Reporting Policy Committee (AAA 2007(a)) and Financial Reporting Standards Committee (AAA 2007(b)) arrive at different conclusions regarding interpretation of the research evidence and its implications for policy relating to SEC discontinuance of the Form 20-F reconciliation. Some research (e.g., Gordon et. al.2009, Henry et al. 2009, Chen and Sami 2008, and Harris and Mueller 1999) suggests that the Form 20-F reconciliation amounts convey price relevant information to investors and are thereby important to investors.[19] On the other hand, other evidence indicates that the Form 20-F reconciliation amounts are not useful to investors suggesting that IFRS quality has increased in recent years to the extent that little difference between U.S. GAAP and IFRS remains (e.g., Bartov et al. 2005 and Leuz 2003).[20] Senteney et al (2014) evaluate the ADR and equity share response to U.S.-listed ADR Form 20-F filing in a manner similar to Chen and Sami (2009, 2008). They provide evidence that the U.S. ADR market response to the SEC form 20 F filing dominates the home-country equity share response for U.S. GAAP filers. They claim that the U.S. ADR and home equity market responses are virtually identical for home country accounting standards and IFRS filers.

An extensive body of academic literature has cumulated over recent years consisting of a substantial number of research reports addressing various aspects relating to the implementation and economic/ statistical properties of financial reporting employing IFRS. Soderstrom and Sun (2007) survey the literature pertaining to accounting quality and IFRS implementation and point out that the greatest number of studies focus on stock price-related measures of accounting quality (e.g., value-relevance, information content, timeliness, and etcetera) concluding that these studies do not provide a comprehensive view of the usefulness of IFRS since they focus solely on how information is impounded in equity market investors' expectations. Furthermore, Bradshaw et al. (2010) find that, even though both IFRS and U.S. GAAP represent high-quality accounting standards, material reconciling items persist to

the extent of establishing considerable uncertainty that IFRS constitute accounting standards which are of equivalent or higher quality when compared with U.S. GAAP. Some examples of the vast literature examining the attributes of IFRS and the attributes of IFRS reconciliations are shown in the Tables below.

Examples of Extant Research Examining Various Attributes of IFRS Data

Attributes of IFRS Financial Statements.	Christensen et al. (2009), Barth et al. (2008), Van der Meulen et al. (2007), Soderstrom and Sun (2007), LaPointe-Antunes et al. (2006), Haverty (2006), Daske and Gebhardt (2006), Ashbaugh and Pincus (2001), and Chen et al. (1999).
Economic Benefits and Costs of Adopting IFRS.	Wu and Zhang (2009), Platikanova (2009), Daske et al. (2008), Kim et al. (2007), Kim and Shi (2007, 2008), Daske (2006), Dargenidou et al. (2006), and Leuz and Verrecchia (2000).
Factors Associated With Voluntarily IFRS Adoption.	Francis et al. (2008) and Tarca (2004).

Examples of Extant Research Examining Various Attributes of IFRS Reconciliations

Properties and Value-Relevance of IFRS U.S. GAAP Reconciliations.	Henry et al. (2009), Chen and Sami (2008), Schadewitz and Vieru (2007), Christensen et al. (2007), Lin and Chen (2005), Niskanen et al. (2000), and Harris and Muller (1999).
Information Content/ Value-Relevance of IFRS- U.S. GAAP Earnings.	Gjerde et al. (2008), Barth et al. (2008), Ndubizu and Sanchez (2006), LaPointe-Antunes et al. (2006), Lin and Chen (2005) Bartov et al. (2005), Ashbaugh and Olsson (2002), and Kinnunen et al. (2000).

The literature addressing the statistical properties of accounting financial statement amounts generated using IAS/IFRS largely indicates that IFRS accounting principles generate accounting measures which are of higher quality in relation to home country accounting principles with the exception of U.S. GAAP.[21] Barth, Landsman, and Lang (2008) use a sample of 319 IFRS reporting companies from 1990 to 2003, providing empirical results indicating that companies using IFRS display (1) smaller degree of earnings smoothing, (2) loss recognition with greater timeliness, and (3) greater value relevance than firms applying non-US domestic GAAP. Results reported by Ashbaugh and Pincus (2001) indicate that analyst forecast errors for IFRS firms are smaller than firms using non U.S. domestic GAAP. On the other hand, Barth, Landsman, Lang, and Williams (2006) find that IAS/IFRS firms exhibit more earnings smoothing, more timely loss recognition and less pronounced relation between accounting earnings and share prices in comparing IFRS to U.S. GAAP firms with a sample of 428 IFRS reporters from 1990 through 2004. They also find similar financial reporting quality for IFRS and U.S. GAAP measures using the subsample of firms that are cross-listed on U.S. stock exchanges.

The International Accounting literature examines the comparative information content of accounting numbers generated using alternative accounting principles before the advent of the EU 2005 wide-scale implementation of IFRS. An increasingly sizable body of related literature examines Form 20-F Item 17 or 18 reconciliations from non-US to U.S. GAAP establishing a solid historical foundation for interpretation of the value relevance of the Form 20-F reconciliations. In reviewing the extant research literature, Pownall and Schipper (1999) note that prior research documents significant differences between U.S. GAAP and both non-US GAAPs and IFRS using Form 20-F reconciliation data and provides some indication that the differences are value-relevant. Amir, Harris, and Venuti (1993), for example, examine the value relevance of Form 20-F reconciling items between non U.S. domestic and U.S. GAAP earnings and shareholders' equity 1981-1991 using a sample of 101 cross-listed companies. Their research results indicate that Form 20-F reconciliations are both in aggregate and for certain specific components (e.g., property revaluations and capitalized goodwill) equity share value relevant. Providing only inconclusive evidence regarding the equity share value relevance of the Form 20-F reconciliations, Harris and Mueller (1999) investigate just reconciliations of IFRS with U.S. GAAP for 31

companies from 1992 to 1996 and report (1) U.S. GAAP earnings Form 20-F reconciliation is value relevant and (2) U.S. GAAP more highly associated with market variables after controlling for IFRS amounts in specific empirical statistical models.

More recent research related to comparative accounting principles measures examine the statistical properties of accounting measures for U.S. cross-listed companies employing a somewhat different perspective. Lang, Raedy and Yetman (2006) compare U.S. cross-listed firms with non-cross-listed companies over the time period from 1990 through 2001. Their results indicate that cross-listed firms' accounting measures display less earnings smoothing, increased timeliness for loss recognition, and greater share value-relevance than non-cross-listed companies. Lang, Raedy and Wilson (2006) compare 131 U.S. cross-listed Form 20-F foreign private Level II or Level III ADR issuers firms with U.S. companies over the years 1991-2002. Their results indicate that U.S. GAAP accounting principles measures for cross-listed firms differ from those of U.S. firms with respect to the time-series properties of reported earnings and accrual amounts, as well as the extent of the relation between accounting measures and equity share values. All things considered, the literature indicates that differences in the reporting of U.S. cross-listed companies and U.S. companies exist even with the reconciliations. Empirical evidence from this literature suggests that cross-listed firms engage in less earnings management than non-cross-listed firms.

Sample Selection Method and Sample Firms

The sample for our research study is non-U.S. firms having ADRs listed on a major U.S. stock exchange and subject to the U.S. Securities and Exchange Commission periodic filing requirements.[22] We are interested in ADR firms with SEC Form 20-F annual reporting requirements from January 1, 2000 and extending through December 31, 2010. The SEC requires that non-U.S. firms file their annual reports no later than six months after their fiscal year end, where calendar year-end firms file in months from March to July.[23] We examine the accounting policy footnote for each 20-F filed with the SEC during this time period in order to determine the accounting principles used to prepare the annual report included with the SEC Form 20-F filing. We collect the SEC Reporting GAAP and Net Income and Shareholders Equity amounts from respective fiscal year-end Form 20-F filings. In order to obtain a list of ADRs to search Form 20-F filings, we merge lists of ADR companies from Bank of New York and JP Morgan ADR Universe websites to identify ADRs traded on the NYSE, AMEX, or NASDAQ stock exchanges and are subject to SEC periodic filing requirements. The final sample results in 402 ADR firms reporting to the SEC using Home Country Accounting Principles, IFRS, and U.S. GAAP. Some examples of recent research studies examining SEC Form 20-F reconciliations and their respective ADR firm sample sizes are shown in the Table below.

Sample Size Comparison of Recent Research Studies Examining Attributes of SEC Form 20-F Reconciliations:

Authors of Research Manuscript Addressing Form 20-F Reconciliation	SEC Form 20-F Sample Size Used	Time Period Examined	Journal That Published the Relevant Research
Kim, Li, and Li (2012)	78 Firms	2006-2007	Journal of Accounting and Economics
Harris and Mueller (1999)	31 Firms	1999	Journal of Accounting and Economics
Gordon, Jorgensen, Linthicum (2008)	156 Firms	2005-2006	Unpublished Working Paper
Chen and Sami (2008)	48 Firms	1995-2004	Contemporary Accounting Research
Chen and Sami (2009)	48 Firms	2006-2007	Unpublished Working Paper
Henry, Lin, Yang (2009)	75 Firms	2004-2006	Accounting Horizons
Jiang, Petroni, Wang (2010)	88 Firms	2005-2007	Unpublished Working Paper
Lang, Raedy and Wilson (2006)	131 Firms	1991-2002	Journal of Accounting and Economics

The definitions of the variables employed in the statistical estimation and hypothesis tests and their computational measurement are listed and discussed below.

Definition of U.S. Exchange Listed ADR SEC Form 20-F Accounting Principles Choice Market Variables Employed in Comparative Statistical Analyses of Cross Market Response to SEC Form 20-F Release:

Variable Abbreviation	Variable Definition and Computational Measurement
1. Annual Form 20-F Securities and Exchange Commission Filing:	
Accounting Principles Choice Variable SEC 20-F GAAP$_{it}$:	Identification of whether U.S.-listed ADRs use U.S. GAAP, IFRS (or predecessors), or Home Country Accounting Standards in filing annual Form 20-F with the U.S. Securities and Exchange Commission. The determination of the accounting principles used for the SEC Form 20-F Filing was obtained through examination of Form 20-F on SEC EDGAR database (SEC.gov). To indicate increasing quality of accounting disclosures, the qualitative variable SEC 20-F GAAP$_{it}$ takes integer values 1, 2, 3.
2. Daily ADR and Equity Share Returns and ADR and Equity Share Market Returns:	
U.S. Exchange Listed ADR Share Return R$_{it}$:	U.S. exchange-listed ADR share daily close price-to-close price dividend adjusted security returns (i.e., R$_{it}$ = $\frac{P_{it} - P_{it-1} + D_{it}}{P_{it-1}}$ for ith U.S. exchange-listed ADR sample firm on trading day t).
Home Country Equity Share Return LR$_{it}$:	U.S. exchange-listed ADR local ("L") market daily close price-to-close price dividend adjusted security returns (i.e., LR$_{it}$ = $\frac{LP_{it} - LP_{it-1} + LD_{it}}{LP_{it-1}}$ for ith U.S. exchange-listed ADR sample firm on trading day t).
U.S. Exchange Listed ADR Share Market Return R$_{Mt}$:	Equal weighted average daily close price-to-close price dividend-adjusted security return over all firms (having non-missing data) and over the three major exchanges trading ADRs (i.e., NYSE, AMEX, NASDAQ) from 2000 to 2010.
U.S. Exchange Listed ADR Equity Market Return LR$_{Mt}$:	Equal weighted average daily close price-to-close price dividend-adjusted security return over all firms (having non-missing data) and over all firms comprising the major local market index for each sample firm local market.
3. Daily ADR and Equity Share Trading Volume and ADR and Equity Share Market Trading Volume:	
U.S. Exchange Listed ADR Share Trading Volume V$_{it}$:	U.S. exchange-listed (i.e., NYSE, AMEX, NASDAQ) ADR share daily number-of-shares traded (i.e., V$_{it}$ = $\left[\frac{Trading\ Volume_{it}}{Number\ of\ Shares\ Outstanding_{it}}\right]$ for ith U.S. exchange-listed ADR sample firm on trading day t).
Home Country Equity Share Return LV$_{it}$:	U.S. exchange-listed ADR local ("L") market daily number-of-shares traded (i.e., LV$_{it}$ = $\left[\frac{Local\ Trading\ Volume_{it}}{Local\ Shares\ Outstanding_{it}}\right]$ for ith U.S. exchange-listed ADR sample firm on trading day t).
U.S. Exchange Listed ADR Share Market Return V$_{Mt}$:	Equal weighted average daily number-of-shares traded over all firms (having non-missing data) and over the three major exchanges trading ADRs (i.e., NYSE, AMEX, NASDAQ) from 2000 to 2010.
U.S. Exchange Listed ADR Equity Market Return LV$_{Mt}$:	Equal weighted average daily number-of-shares traded over all firms (having non-missing data) and over all firms comprising the major local market index for each sample firm local market.
4. Daily ADR Home Country to U.S. Dollar Exchange Rate	
Daily Percentage Change In Home Country Exchange Rate % Δ ER$_{it}$:	Percentage change in the daily spot home currency to U.S. dollar exchange rate (i.e., $\%\ \Delta\ ER_{it}$ = $\left[\frac{ER_{it} - ER_{it-1}}{ER_{it-1}}\right]$).

Descriptive statistics for the quantitative data variables employed in the statistical models and hypothesis tests are shown in Table No.1 and Table No.2 (See Appendix). Table No.1 shows distributional statistics for the data employed in the empirical analyses and Table No.2 shows the Pearson

and Spearman Rank correlation coefficients (and probability values for the test of the null hypothesis that the respective correlation coefficient is equal to zero) for the quantitative data variables used in this research.

Testing Granger Causality

We test for Granger Causality in order to ascertain whether evidence exists indicating that a statistically significant information flow[24] occurs from the U.S. listed ADR shares to the home country underlying equity security.[25] In the event that past values of U.S.-listed ADR returns (trading volume) are useful in predicting equity returns (trading volume) in addition to the past values of the equity returns (trading volume), then the U.S.-listed ADR share returns (trading volume) is said to Granger cause the equity return (trading volume) in the home country. Rejection of the null hypothesis provides an initial indication that the U.S.-listed ADR returns (trading volume) dominates the equity returns (trading volume) cross-market information flow as an inherent part of the securities market price formation process. This statistical result is consistent with the observation that the preeminent disclosures required by the U.S. SEC for large exchange listing contribute significantly to the security market price formation process, not only in the U.S., but in the home country as well. Consequently, finding that U.S. ADR share return (volume) dominates equity returns (trading volume) in the home country provides evidence (1) regarding the usefulness of the incremental SEC Form 20-F disclosures as well as (2) of the improvement of the cross-listed firm information environment as a result of the incremental SEC Form 20-F disclosures.

Granger Causality: Using Granger Causality Test to test SEC Form 20-F information flow hypothesis: Does an autoregressive return regression of lag length p which includes U.S. ADR returns as explanatory variables explain more of the local market equity security return behavior than an autoregressive regression containing only lagged local market equity security returns?

Panel A: Equity Security (Home Country Local Securities Market)		
	Restricted Model	Unrestricted Model
Security Returns	$LR_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot LR_{it-j} + o_{it}$	$LR_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot LR_{it-j} + \sum_{j=1}^{j=p} \eta_j \cdot R_{it-j} + \pi_{it}$
Trading Volume	$LV_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot LV_{it-j} + o_{it}$	$LV_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot LV_{it-j} + \sum_{j=1}^{j=p} \eta_j \cdot V_{it-j} + \pi_{it}$
Panel B: ADR Security (U.S. Major Securities Exchange)		
	Restricted Model	Unrestricted Model
Security Returns	$R_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot LR_{it-j} + o_{it}$	$R_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot LR_{it-j} + \sum_{j=1}^{j=p} \eta_j \cdot R_{it-j} + \pi_{it}$
Trading Volume	$V_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot LV_{it-j} + o_{it}$	$V_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot LV_{it-j} + \sum_{j=1}^{j=p} \eta_j \cdot V_{it-j} + \pi_{it}$

Granger Test Statistic Computation:	Granger Test Statistic Interpretation:
Granger F-Test: $F_{P,T-2P-1} \sim \dfrac{\frac{SSE_0 - SSE_1}{P}}{\frac{SSE_1}{T-2P-1}}$	If the test statistic is greater than the specified critical value then the Null Hypotheses that ADR Returns and Trading Volume do not cause Security Returns and Trading Volume is rejected and we conclude that ADR Returns and Trading Volume are exogenous (i.e., that *ADR Returns and Trading Volume do* Granger-cause *Security Returns and Trading Volume).*
Granger χ^2-Test: $\chi^2{}_P \sim \dfrac{T \cdot (SSE_0 - SSE_1)}{SSE_1}$	χ^2-test which is asymptotically equivalent to the F-test.

Tables No.3, No.4, and No.5 (See Appendix) show the results of the Granger F-Statistic tests of the null hypothesis that the inclusion of additional variables in autoregressive models of equity security and ADR returns in trading volume do not improve the explanatory power model for the particular dependent variable (i.e., equity returns, ADR returns, equity trading volume, ADR trading volume). Table No.3 shows the result of the Granger F-Statistic tests for the four pairs of regressions overall firms pooled (i.e., over all firms, trading days, and SEC Form 20-F GAAP choices). We infer from the four Granger F-

Statistic tests that information flows in both directions as indicated by security and ADR returns, however, security and ADR trading volume indicates no statistically significant cross-market information flows at the $\alpha = 0.05$ confidence level. Table No.4 shows similar Granger F-Statistic tests for the sample firms partition according to SEC Form 20-F GAAP choices and otherwise pooled (i.e., over all firms and trading days). The Granger F-Statistic tests indicate that cross-market information flows in both directions (i.e., as indicated by security and ADR returns and trading volume) for the Local Accounting Standards and IFRS SEC Form 20-F GAAP choices but that, interestingly, for the U.S. GAAP that SEC Form 20-F GAAP choice firms statistically significant cross-market information flows are indicated for security and ADR returns but not trading volume at the $\alpha = 0.05$ confidence level. Table No.5 shows the result of the Granger F-Statistic tests for the SEC Form 20-F filing date only (i.e., and otherwise pooled over all firms) for the sample first partitioned by SEC Form 20-F GAAP choices. Panel A of Table No.5 shows that the first four Granger F-Statistic tests indicate statistically significant SEC Form 20-F filing date cross-market information flows for equity share and ADR returns but none for equity share and ADR trading volume for Local Accounting Standards SEC Form 20-F GAAP choices. Panel B of Table No.5 indicates that Granger F-Statistic tests show statistically significant SEC Form 20-F filing date cross-market information flows for equity share and ADR returns and trading volume for the IFRS SEC Form 20-F GAAP choice firms. Panel C of Table No.5 indicates that Granger F-Statistic tests show statistically significant SEC Form 20-F filing date cross-market information flows for equity share and ADR returns but not trading volume for the U.S. GAAP SEC Form 20-F GAAP choice firms.

Conclusions and Suggestions for Future Research

This study evaluates the ADR and equity share response to U.S.-listed ADR Form 20-F SEC filing in a manner similar to Chen and Sami (2012, 2008) anticipating that the incremental Form 20-F disclosures will prompt ADR and equity security share responses. Unlike prior studies, however, we investigate whether the Form 20-F filings prompt U.S. dominant cross-market information flows from the ADR share market back to the home country equity share market proportional to the incremental Form 20-F SEC filing information, because a prominent attribute of ADR firms is that they benefit from multiple-market trading. The perceived higher quality accounting disclosures required by the U.S. Securities and Exchange Commission for Level II and III ADRs listed on the major U.S. exchanges (i.e., NYSE, AMEX, and NASDAQ) ought to prompt an equity share market response proportional to the new information and, consequently, one ought to observe the rapid erosion of any accompanying pricing differentials as a result. Our results indicate that the U.S. ADR market response to the SEC form 20 F filing dominates the home-country equity share response for U.S. GAAP filers. The U.S. ADR and home equity market responses are virtually identical for home country accounting standards and IFRS filers. One contribution of this study is a more focused study of cross-market information transfers by examining the ADR and equity security return and trading volume behavior surrounding the U.S. Securities and Exchange Commission Form 20-F filing date which is known to be a unique source of unsurpassed accounting disclosures providing new information vis-a-vis the equity share market for a number of U.S.-listed ADR firms. Furthermore, this research provides a more complete perspective of the local and global (i.e., ADR and equity market) reaction to the Form 20-F filing for U.S. exchange-listed ADRs as well as the role of security returns and trading volume in cross-market information transfers analogous to Chen and Sami (2008) and Chen and Sami (2012).

ENDNOTES

1. It is well accepted as a stylized fact that cross-listing has significant valuation effects. The finance literature identifies a number of sources of cross-listing valuation benefits such as the following:
    a. Broadening the Investor Base (Merton (1987), Foerster and Karolyi (1999));
    b. Reducing Market Segmentation (Domowitz, Glenn, and Madhavan (1997) and Miller (1999));

       c. Increasing Liquidity / Multi-Market Trading (Domowitz, Glenn, and Madhavan (1998), Foerster and Karolyi (1999));

       d. Reduction of Asymmetric Information: Firm Information Environment (e.g., Lang et al. (2003), Bailey et al. (2006), and Fernandes and Ferreira (2008)); and

       e. Reduction of Asymmetric Information: Competition Among Exchanges (Chemmanur and Fulghieri (2006)).

2. Form 20-F Item 17 is applicable to U.S. Securities Exchange Act of 1934 registration statements, annual reports on Form 20-F, and registration statements under the U.S. Securities Act of 1933 for investment grade, non-convertible securities and certain rights offerings. Item 17 requires qualitative description of differences and quantitative reconciliation of specific financial statement line items from bases of accounting other than U.S. GAAP to U.S. GAAP amounts. Intending to be efficient and effective, Item 17 does not mandate all U.S. GAAP and Regulation S-X disclosures (e.g., industry segment disclosures). Form 20-F Item 18 is applicable in the financial statements accompanying a Securities Act registration statement for offerings of equity, convertible, and other securities. Item 18 requires the Form 20-F Item 17 information in addition to other information required by U.S. GAAP and Regulation S-X (e.g., segment disclosures).

3. Extant research has examined cross-market information linkages focusing upon the relation among ADR and security returns and trading volume. Eun and Shim (1989), Karolyi (1995), and Chen, Chiang, and So (2003) investigate the relation among larger market returns and King and Wadhwani (1990), Bae and Karolyi (1994), Kanas (1998), and Ng (2000) examine the relation among larger and emerging markets returns, concluding that the U.S. markets are dominant for returns in the sense that information flows from the U.S. market to other global markets. Furthermore, Lee and Rui (2002), Gagnon and Karolyi (2003), and Kim (2005) report research results indicating that U.S. markets are dominant for trading volume in the sense that information flows from the U.S. market to other global markets.

4. The extant research literature suggests that IFRS is closer to U.S. GAAP in terms of desirable attributes of accounting standards than reporting foreign private issuers domestic accounting, however, the financial statements of foreign private issuers reporting using U.S. GAAP are substantially dissimilar from those of U.S. firms reporting using the same U.S. GAAP. Naturally, the inference drawn from this marked quality difference is that the home country socio-economic institutional enforcement incentives, in addition to high quality accounting standards, are needed to establish a high quality financial reporting environment. Early research such as Ball et al. (2000), Ball et al. (2003), and Leuz et al. (2003) address issues relating to accounting standards quality across countries having significantly different socio-economic institutional infrastructure (i.e., enforcement and incentives). More recently, Daske et al. (2009) investigate differences in IFRS firms from countries having greater enforcement and incentives orientation reporting that enforcement and incentives are strongly related to accounting standards quality.

5. Particularly noteworthy is the observation that cross-market trading affords improved opportunities to discern liquidity trading volume from information trading volume (Campbell et al. (1993), Wang (1994), and Blume et al. (1994)) in securities markets research methodology.

6. Foreign private issuers continue to include a U.S. GAAP reconciliation with the Form 20-F in any one of the following circumstances: (1) the foreign private issuer's financial statements contain a departure from IASB IFRS; (2) the foreign private issuer does not indicate unreservedly and explicitly that the financial statements are presented in accordance with IASB IFRS; (3) the foreign private issuer's independent auditor does not opine on compliance with IASB IFRS; and(4) the auditor's report contains any qualification relating to compliance with IASB IFRS.

7. Studies using high-frequency intradaily data include Ding, Harris, Lau, and McInish (1999), Hupperets and Menkveld (2002), Eun and Sabherwal (2003); and Phylaktis and Korczak (2004). All four papers find support for significant price discovery in both the home and the foreign market. Grammig, Melvin, and Schlag (2005) study German and U.S. trading and find support for the home market dominating. Studies based upon lower frequency daily data include Kim, Szakmary, and Mathur (2000) who find a small role for U.S. price discovery in the case of firms from Japan, the Netherlands, the U.K., Sweden, and Australia. Lau and Diltz (1994) detect two-way causality between Japanese and U.S. prices of Japanese firms cross-listed in the U.S., while Lieberman, et.al (1999), studying Israeli firms also traded in the U.S., find that price discovery occurs in Israel, where the U.S. price leads the Israeli price. Wang, Rui, and Firth (2002) and Agarwal, Liu, and Rhee (2007) conclude that for Hong Kong stocks listed in London, Hong Kong is the dominant market, whereas von Furstenberg and Tabora (2004) find two-way causality for two Mexican firms also traded in the U.S.

8. The extant research literature, to date, however, conveys sparse direct evidence indicating that non U.S. firms share cross-listing contributes to the price formation processes in the home country equity shares. Employing variation of firm-specific returns as a proxy for the stock price informativeness construct, Fernando and Ferreira (2008) investigate the impact of the cross-listing decision upon home country equity share price informativeness and report a statistically significant positive relation between U.S cross-listing and home country equity share price informativeness. Bailey et al. (2006) examine the impact of U.S cross-listing upon the magnitude of price and volume reactions to (earnings announcements) contending that more private information equates with higher return volatility reasoning that diminishing return volatility following upon U.S cross-listing may indicate less disagreement among investors regarding interpretation of the earnings announcement. Their results indicate that both absolute return and absolute volume reactions to earnings announcements increase significantly following upon firms' cross-listing of shares on U.S. equity exchanges. Other studies in the extant research literature investigate the impact of non-U.S. firms share cross-listing upon analysts' forecasts and media coverage as surrogates for the firm's information environment. Specifically, Lang et al. (2003) and Baker et al. (2002) report that cross-listed firms derive greater analyst following as well as more accurate earnings forecasts.

9. Foreign private issuers having shares listed on U.S. securities exchanges are subject to the same Regulation S-K periodic reporting requirements as other shares in accordance with U.S. Securities Exchange Act of 1934, and are generally required to present audited financial statements of income, financial position, changes in shareholders' equity and cash flows for each of the past three fiscal years prepared according to an acceptable basis of accounting (e.g., U.S. GAAP, IFRS, or the foreign private issuer's home country accounting principles). For U.S companies, Form 10-K is the annual updating informational requirement and for foreign private issuers Form 20-F is the annual updating information equivalent of the Form 10-K for U.S. firms. Until recently, foreign private issuers submitting financial statements prepared employing a basis of accounting other than U.S. GAAP were required to include in their filings with the SEC a reconciliation of their financial statements to U.S. GAAP. The Form 20-F U.S. GAAP reconciliation identifies and quantifies the significant departures of the non-U.S. GAAP from the requirements of U.S. GAAP and SEC Regulation S-X. This reconciliation requirement dates back more than 25 years.

10. Furthermore, Luez (2006) conjectures that more pronounced the differences with U.S. GAAP may also have the effect of motivating local authorities to convey addition scrutiny. In any event, more pronounced the differences with U.S. GAAP may garner increased investor uncertainty in relation to the parameters of the underlying earnings process (Chen and Sami (2008) and Leuz (2006)). Results reported by Bradshaw (2004) suggest that levels of U.S. ownership of non U.S. firms are greater for ADRs reporting smaller SEC Form 20-F reconciling U.S. GAAP differences. Likewise, Plumlee and Plumlee (2007) report that ADRs reporting smaller SEC Form 20-F reconciling U.S. GAAP differences experienced comparatively higher levels of trading.

11. Naturally, the costs of firm disclosures may be incurred by both foreign private issuers as well as investors. Of course, the costs associated with firms producing and communicating disclosures, including auditing and legal costs, are nontrivial. However, there is also a nontrivial cost to investors of acquiring and assimilating the information. While firm costs associated with producing and disseminating information have been examined in the extant research literature, the costs associated with investors acquiring and assimilating information remains relatively unexamined. We conjecture that the different accounting principles employed by foreign private issuers in the preparation of their financial statements, in numerous instances, represents a nontrivial cost to U.S. investors which is mitigated to a large extent by the SEC Form 20-F reconciliation to U.S. GAAP.

12. One stream of extant research literature suggests that more analyst coverage and more accurate earnings forecasts lead to an improved information environment (Lang and Lundholm (1996) and Healy et al. (1999)). Baker et al. (2002) report finding increased visibility, as measured by analyst and media coverage, around the time of cross-listing. Results reported by Lang et al. (2003a) suggest that non-U.S. firms listed on U.S. exchanges benefit from increased analyst coverage and more accurate forecasts. Bailey et al. (2006) report research results indicating greater volatility and trading activity around earnings announcements following upon cross-listing of developed market firms. Although a preponderance of the evidence indicates a positive association between the information environment and cross-listing, the relation remains ambiguous for the following reasons:
    - The increased disclosure requirement following upon U.S. exchange cross-listing may substitute for the collection of private information to the extent that a smaller amount of

firm-specific information would be impounded into stock prices (Kim and Verrecchia (2001)).

- Easley et al. (1998) and Roulstone (2003) suggest that analyst activity is not necessarily a reliable indicator of private information trading since analysts themselves are more of a conduit and do not have significant firm-specific information. Moreover, Piotroski and Roulstone (2004) research results indicating that increased analyst coverage stimulates the production of industry and market-wide information and undermines firm-specific stock return variation. Chan and Hameed (2006) report research results indicating that greater analyst coverage results in decreased firm-specific return variation in emerging markets.
- The cross-listing information environment effect may vary across countries. The improved disclosure following upon U.S. ADR cross-listing may have a differential impact on the home country environment. Ball (2001) suggests that improving accounting disclosures by itself is insufficient to substantially improve information environment. A diverse range of other country specific economic, legal, and political infrastructure modifications are needed in order to improve the actual quality of financial reporting. Licht (2003) and Siegel (2005) assert that the voluntary disclosure following upon U.S. cross-listing permits firms to bond their reputations to U.S. disclosure requirements. Lang et al. (2006) report that the added regulation by the SEC remains ineffective, but rather that U.S. listed ADRs home environment remains important in explaining the quality of its U.S. GAAP-reported earnings.

13. Exchange Act of 1934 Rule 3b-4 Definition of Foreign Private Issuer Status: An entity incorporated or organized under in accordance with the laws of a nationality other than the U.S. is a "foreign private issuer" following upon 1933 Act Rule 405 and 1934 Act Rule 3b-4, except in the event (1) greater than 50% of the entity's outstanding voting securities are directly or indirectly held by residents of the United States, and (2) any one of the following conditions are satisfied: (a) the majority of its executive officers or directors are U.S. citizens or residents, (b) greater than 50% of its assets are located in the United States, or (3) its business is administered principally in the United States. In the event that a foreign corporation fails to satisfy foreign private issuer status the entity becomes subject to the provisions of the U.S. securities laws applicable to a domestic corporation. For the purpose of determining foreign private issuer status, a foreign private issuer ought to calculate its U.S. ownership considering more than the record ownership of U.S. brokers, dealers, banks and nominees, those located in the issuer's home jurisdiction, or those located in the primary trading market for the issuer's securities in order to ascertain the residency of their customers. In the event that the foreign private issuer cannot acquire this information after reasonable inquiry (or if the cost of acquiring the information is unreasonable), the entity may assume that the customers are resident in the jurisdiction where the entity has its principal place of business since brokers, dealers, banks or other nominees may be unwilling or unable to provide information regarding customer accounts. The SEC implemented a rule mandating that corporations test their foreign private issuer status annually as of the last business day of the second fiscal quarter in September 2008. An entity satisfying the conditions for foreign private issuer status immediately becomes eligible to use the for foreign private issuers procedures following upon the 1933 Act and 1934 Act. A foreign private issuer failing to satisfy the conditions for foreign private issuer status must begin using the forms and complying with the rules for U.S. issuers as of the first day of the fiscal year following the date on which the issuer no longer qualifies for foreign private issuer status. (SEC Release No.33-8959 and Release No.34-58620).

14. Foreign private issuers having shares listed on U.S. securities exchanges are subject to the same Regulation S-K periodic reporting requirements as other shares in accordance with U.S. Securities Exchange Act of 1934, and are generally required to present audited financial statements of income, financial position, changes in shareholders' equity and cash flows for each of the past three fiscal years prepared according to an acceptable basis of accounting (e.g., U.S. GAAP, IFRS, or the foreign private issuer's home country accounting principles). For U.S companies, Form 10-K is the annual updating informational requirement and for foreign private issuers Form 20-F is the annual updating information equivalent of the Form 10-K for U.S. firms. Until recently, foreign private issuers that submitting financial statements prepared employing a basis of accounting other than U.S. GAAP were required to include in their filings with the SEC a reconciliation of their financial statements to U.S. GAAP. The Form 20-F U.S. GAAP reconciliation identifies and quantifies the significant departures of the non U.S. GAAP from the requirements of U.S. GAAP and SEC Regulation S-X. This reconciliation requirement dates back more than 25 years.

15. The Financial Reporting Policy Committee (2008) found that the SEC decision to eliminate the Form 20-F reconciliation for English Language IFRS financial statement is ill-founded since (1) material differences exist between IFRS and U.S. standards, (2) stock prices adjust to the information in the reconciliation, and (3) differential implementation and enforcement of standards across countries may reduce the comparability of financial reports across jurisdictions. Henry et al. (2009) report evidence consistent with these assertions finding that reported net income was 59% (29%) greater in 2004 (2005) under IFRS than under U.S. GAAP for 83 E.U.-U.S. cross-listed companies submitting SEC Form 20-F reconciliations.

16. Financial Accounting and Reporting Section of the American Accounting Association: Financial Reporting Policy Committee. File No. S7-13-07. Response to the SEC Release: Acceptance From Foreign Private Issuers Of Financial Statements Prepared In Accordance With International Financial Reporting Standards Without Reconciliation To U.S. GAAP. (http://www.sec.gov/comments/s7-13-07/s71307-91.pdf).

17. Financial reporting environment quality is determined, in part, by firms selection of accounting standards but also by socio-economic institutional degree of implementation of auditing and enforcement incentives (e.g., Ball 2001 and Ball et al. 2003). Consequently, although IFRS are considered sufficiently high quality standards, firms' financial statements may be unreliable due to poorly implemented auditing and enforcement incentives among foreign private issuers home countries.

18. Since U.S. GAAP is generally perceived by investors as constituting the standard for "high-quality" accounting standards, the SEC Form 20-F reconciling differences with U.S. GAAP earnings and equity impose important constraints on management accounting policy choices. The effective SEC Form 20-Fmanagement accounting policy choice constraint arises as a result of the need to minimize the reconciling differences with U.S. GAAP in communicating to investors the relative success of their prospective investment projects in order for investors to perceive the ADR as maintaining similarly "high-quality" reporting practices as other firms at their comparative market stature. Quite naturally, the more pronounced the differences with U.S. GAAP earnings and equity raise important question regarding earnings management practices. Furthermore, Luez (2006) conjectures that more pronounced differences with U.S. GAAP may also have the effect of motivating local authorities to convey additional scrutiny. In any event, more pronounced differences with U.S. GAAP may garner increased investor uncertainty in relation to the parameters of the underlying earnings process (Chen and Sami (2008) and Leuz (2006)). Results reported by Bradshaw (2004) suggest that levels of U.S. ownership of non U.S. firms is greater for ADRs reporting smaller SEC Form 20-F reconciling U.S. GAAP differences. Likewise, Plumlee and Plumlee (2007) report that ADRs reporting smaller SEC Form 20-F reconciling U.S. GAAP differences experienced comparatively higher levels of trading.

19. Although implied usefulness may be inferred from empirical evidence establishing association with security returns, the 20-F reconciliation information used by investors is better inferred from trading volume studies. In this particular case, Chen and Sami (2008) provide evidence of statistically significant unexpected volume reactions to 20-F reconciliation information for years 1995-2004 and Chen and Sami (2010) present evidence of statistically significant unexpected volume reactions to 20-F reconciliation information for years 2005-2006. On the other hand, Plumlee and Plumlee (2007) report finding no of unexpected trading volume reactions to Form 20-F filings for years 2002 to 2006. Similarly, Jiang et al. (2010) report observing no evidence of significant unexpected trading volume reactions to Form 20-F filings for years 2005-2006.

20. Extant research suggests that the previously observed usefulness of the Form 20-F reconciliation may have largely eroded by 2006 because of the increasing degree of convergence between IFRS and U.S. GAAP (e.g., Jiang et al. 2010, Chen and Sami 2010, Plumlee and Plumlee 2007).

21. Early research such as Harris and Mueller (1999) provides statistically significant research results indicating that U.S. GAAP earnings convey security price relevant information beyond that communicated with IFRS. Employing a sample of 31 firms over the years 1992-1996 (i.e., a total of 89 firm year observations), they regress U.S. GAAP earnings and earnings changes expressed in terms of the decomposed IFRS and home country earnings and earnings changes and their respective Form 20-F reconciliation amounts and changes in the respective Form 20-F reconciliation amounts onto annual equity securities returns. More specifically, they find that the IFRS to U.S. GAAP reconciliation amount is statistically significant in its association with annual equity securities returns at conventional confidence levels (i.e., p.302 Table 4 Panel B). Harris and Mueller employ a security returns v. earnings levels model identical to the one used by Amir et al. (1993) and Barth and Clinch (1996) to investigate the security price relevance of Home Country GAAP vs. U.S. GAAP differences and corroborate their findings that the SEC Form 20-F reconciliation amounts are significantly associated with equity security returns. The Amir et al.

(1993) research examines Form 20-F reconciliations over the years 1981-1991 and utilizes a sample of 101 firms.

22. **Sponsored Level I Depositary Receipts**: Level I Depositary Receipts are traded in the U.S. over-the-counter (OTC) market with prices published in the *Pink Sheets*. Level I programs do not require full SEC registration and the company does not have to submit financial statements prepared in accordance with U.S. Generally Accepted Accounting Principles or provide full Securities and Exchange Commission disclosure. The Sponsored Level I Depositary Receipt program allows companies to enjoy the benefits of a publicly traded security without altering its current reporting process. The majority of sponsored programs are Level I instruments and it is not unusual for a company with a Level I program to obtain 5 percent to 15 percent of its shareholder base in Depositary Receipt form. Numerous companies have started with a Level I program and then upgraded to a Level II (listing) or Level III (offering) program.

   Sponsored Level II and Sponsored Level III Depositary Receipts: Companies wanting to list their Depositary Receipts on a U.S. stock exchange (NASDAQ, American or New York), raise capital or make an acquisition using securities, use Sponsored Level II or Sponsored Level III Depositary Receipts. Level II and Level III Depositary Receipt programs require SEC registration and compliance with periodic reporting requirements. Level II Depositary Receipts are exchange-listed securities but do not involve raising new capital. Level III programs typically generate the most U.S. investor interest because capital is being raised and companies that choose either a Level II or Level III program will attract a significant number of U.S. investors.

   Privately Placed and Offshore (SEC Rule 144A / Regulation S) Depositary Receipts: Firms may access the U.S. and other capital markets through SEC Rule 144A and/or SEC Regulation S Depositary Receipt securities without SEC registration in addition to the three levels of sponsored Depositary Receipt programs trading publicly in the U.S. Rule 144A programs provide for raising capital through the private placement of Depositary Receipts with large institutional investors in the United States. Regulation S programs provide for raising capital through the placement of Depositary Receipts offshore to non-U.S. investors in reliance on Regulation S. A Level I program can be established in addition to a Rule 144A program, and a Regulation S program may be merged into a Level I program after the restricted period has expired.

23. **Determining Filer Status:** All companies reporting in accordance with the Securities Exchange Act fall into one of three categories of filers: large accelerated filers, accelerated filers and all other filers (a category which is itself comprised of non-accelerated filers and smaller reporting companies). In addition to other relevant considerations, filer status establishes the deadline by which registrants must file their annual and quarterly reports with the Securities and Exchange Commission. Ascertaining filer status necessitates consideration of the registrant public float and reporting history. The registrant public float is the worldwide non-affiliate market capitalization and, for purposes of filer status, is calculated as of the last business day of the most recently completed second fiscal quarter. The registrants reporting history refers to how long it has been an Exchange Act reporting company. To be a large accelerated filer the registrant needs to have a public float of $700 million or more. In order to be considered an accelerated filer the registrant must have a public float of $75 million or more, but less than $700 million. Furthermore, in either case the registrant must have been subject to the reporting requirements of the Exchange Act for at least twelve calendar months, must have filed at least one annual report, and cannot qualify as a smaller reporting company. All other companies (including newly public companies e.g., LinkedIn, Groupon and Zynga) fall into the category of other filers and are classified as either non-accelerated filers or smaller reporting companies.

24. Granger Causality in Information Theory: Schreiber (2000) introduced the concept of transfer entropy which is a version of mutual information operating on conditional probabilities. It is designed to detect the directed exchange of information between two variables, conditioned to common history and inputs. For a comparison of transfer entropy with other causal measures see Lungarella et al. (in press). An advantage of information theoretic measures (relative to standard G-causality) is that they are sensitive to nonlinear signal properties. A limitation of transfer entropy is that it is currently restricted to bivariate situations. Furthermore, information theoretic measures often demand substantially more data than regression methods such as G-causality (Pereda et al., 2005).

25. Following upon Granger causality, if past values of X_1 should contain information that helps predict X_2 above and beyond the information contained in past values of X_2 alone then X_1 is said to Granger-cause X_2.

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TABLE 1
DESCRIPTIVE STATISTICS U.S.-LISTED ADR AND SECURITY
RETURN AND TRADING VOLUME

Descriptive Statistics:

Statistic	Exch. Rate	ADR and Equity Share Returns				ADR and Equity Share Trading Volume			
	ER_{it}	R_{it}	LR_{it}	R_{mt}	LR_{mt}	V_{it}	LV_{it}	V_{mt}	LV_{mt}
Mean	0.003908	0.019605	0.018814	0.008392	0.009919	0.00866	0.00109	0.007815	0.002691
Std.Dev.	0.005766	0.025085	0.025395	0.010021	0.012116	0.022103	0.013736	0.003321	0.002622
Median	0.002022	0.012444	1.17E-02	0.005431	0.006438	0.000611	9.00E-08	0.007259	0.002174
Kurtosis	187.762	59.27369	82.07176	15.62911	21.3464	20.90149	615.7012	1.112424	9.710391
Skewness	7.409199	4.88971	5.80088	3.205792	3.317275	4.254238	21.91075	0.486224	1.684746

Variable Acronym Definitions: R_{it}: U.S. exchange-listed ADR share daily close price-to-close price dividend adjusted security returns. LR_{it}: U.S. exchange-listed ADR local ("L") market daily close price-to-close price dividend adjusted security returns. R_{Mt}: Equal-weighted average daily close price-to-close price dividend-adjustedsecurity return over all firms and over the three major exchanges trading ADRs. LR_{Mt}: Equal weighted average daily close price-to-close price dividend-adjusted security return over all firms and firms comprising the major local market index for each sample firm. V_{it}: U.S. exchange-listed ADR share daily number-of-shares traded. LV_{it}: U.S. exchange-listed ADR local ("L") market daily number-of-shares traded. V_{Mt}: Equal weighted average daily number-of-shares traded over all firms and over the three major exchanges trading ADRs. LV_{Mt}: Equal weighted average daily number-of-shares traded over all firms and over all firms comprising the major local market index for each sample firm local market. $\% \Delta ER_{it}$: Percentage change in the daily spot home currency to U.S. dollar exchange rate.

TABLE 2
PEARSON AND SPEARMAN RANK CORRELATION COEFFICIENTS DISPLAYING RELATIONSHIPS AMONG U.S.-LISTED ADR AND EQUITY SHARE RETURNS AND TRADING VOLUME AND U.S. DOLLAR EXCHANGE RATES

Pearson Correlation Coefficients: Prob> |ρ| under H_0: ρ =0

	ADR and Equity Share Returns and Exch.Rate						ADR and Equity Share Volume and Exch.Rate				
	R_{it}	LR_{it}	R_{mt}	LR_{mt}	ER_{it}		V_{it}	LV_{it}	V_{mt}	LV_{mt}	ER_{it}
R_{it}	1.00000	0.62311	0.36945	0.26268	0.13672	V_{it}	1.00000	0.01479	0.11010	0.05040	-0.01129
	NA	(<.0001)	(<.0001)	(<.0001)	(<.0001)		NA	(<.0001)	(<.0001)	(<.0001)	(<.0001)
LR_{it}	0.62311	1.00000	0.23122	0.31162	0.12483	LV_{it}	0.01479	1.00000	-0.04106	0.01705	-0.01242
	(<.0001)	NA	(<.0001)	(<.0001)	(<.0001)		(<.0001)	NA	(<.0001)	(<.0001)	(<.0001)
R_{mt}	0.36945	0.23122	1.00000	0.36897	0.19723	V_{mt}	0.11010	-0.04106	1.00000	0.18532	0.09781
	(<.0001)	(<.0001)	NA	(<.0001)	(<.0001)		(<.0001)	(<.0001)	NA	(<.0001)	(<.0001)
LR_{mt}	0.26268	0.31162	0.36897	1.00000	0.17038	LV_{mt}	0.05040	0.01705	0.18532	1.00000	-0.08557
	(<.0001)	(<.0001)	(<.0001)	NA	(<.0001)		(<.0001)	(<.0001)	(<.0001)	NA	(<.0001)
ER_{it}	0.13672	0.12483	0.19723	0.17038	1.00000	ER_{it}	-0.01129	-0.01242	0.09781	-0.08557	1.00000
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	NA		(<.0001)	(<.0001)	(<.0001)	(<.0001)	NA

Spearman Rank Correlation Coefficients: Prob> |ρ| under H_0: ρ =0

	ADR and Equity Share Returns and Exch.Rate						ADR and Equity Share Volume and Exch.Rate				
	R_{it}	LR_{it}	R_{mt}	LR_{mt}	ER_{it}		V_{it}	LV_{it}	V_{mt}	LV_{mt}	ER_{it}
R_{it}	1.00000	0.52606	0.31389	0.18735	0.05215	V_{it}	1.00000	0.08779	0.17723	0.04664	0.07427
	NA	(<.0001)	(<.0001)	(<.0001)	(<.0001)		NA	(<.0001)	(<.0001)	(<.0001)	(<.0001)
LR_{it}	0.52606	1.00000	0.18107	0.26540	0.07909	LV_{it}	0.08779	1.00000	-0.52688	0.07739	0.10529
	(<.0001)	NA	(<.0001)	(<.0001)	(<.0001)		(<.0001)	NA	(<.0001)	(<.0001)	(<.0001)
R_{mt}	0.31389	0.18107	1.00000	0.21250	0.07026	V_{mt}	0.17723	-0.52688	1.00000	0.15844	-0.01971
	(<.0001)	(<.0001)	NA	(<.0001)	(<.0001)		(<.0001)	(<.0001)	NA	(<.0001)	(<.0001)
LR_{mt}	0.18735	0.26540	0.21250	1.00000	0.04605	LV_{mt}	0.04664	0.07739	0.15844	1.00000	-0.08227
	(<.0001)	(<.0001)	(<.0001)	NA	(<.0001)		(<.0001)	(<.0001)	(<.0001)	NA	(<.0001)
ER_{it}	0.05215	0.07909	0.07026	0.04605	1.00000	ER_{it}	0.07427	0.10529	-0.01971	-0.08227	1.00000
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	NA		(<.0001)	(<.0001)	(<.0001)	(<.0001)	NA

Variable Acronym Definitions: **R_{it}:** U.S. exchange-listed ADR share daily close price-to-close price dividend adjusted security returns. **LR_{it}:** U.S. exchange-listed ADR local ("L") market daily close price-to-close price dividend adjusted security returns. **R_{Mt}:** Equal-weighted average daily close price-to-close price dividend-adjustedsecurity return over all firms and over the three major exchanges trading ADRs. **LR_{Mt}:** Equal weighted average daily close price-to-close price dividend-adjusted security return over all firms and firms comprising the major local market index for each sample firm. **V_{it}:** U.S. exchange-listed ADR share daily number-of-shares traded. **LV_{it}:** U.S. exchange-listed ADR local ("L") market daily number-of-shares traded. **V_{Mt}:** Equal weighted average daily number-of-shares traded over all firms and over the three major exchanges trading ADRs. **LV_{Mt}:** Equal weighted average daily number-of-shares traded over all firms and over all firms comprising the major local market index for each sample firm local market. **% Δ ER_{it}:** Percentage change in the daily spot home currency to U.S. dollar exchange rate.

TABLE 3
GRANGER CAUSALITY TESTS OF CROSS-MARKET INFORMATION FLOWS BETWEEN U.S.-LISTED ADR AND EQUITY SHARE RETURNS AND TRADING VOLUME

	Restricted Model	Unrestricted Model
Equity Returns	$LR_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot LR_{it-j} + o_{it}$	$LR_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot LR_{it-j} + \sum_{j=1}^{j=p} \eta_j \cdot R_{it-j} + \pi_{it}$
ADR Returns	$R_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot R_{it-j} + o_{it}$	$R_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot R_{it-j} + \sum_{j=1}^{j=p} \eta_j \cdot LR_{it-j} + \pi_{it}$

Dependent Variable: Equity Return

	Restricted Model			Unrestricted Model	
	Coeff.	P-Value		Coeff.	P-Value
ζ_0	0.00989	(<.0001)	ζ_0	0.00865	(<.0001)
ζ_{1t-1}	0.19029	(<.0001)	ζ_{1t-1}	0.11382	(<.0001)
ζ_{1t-2}	0.15028	(<.0001)	ζ_{1t-2}	0.11301	(<.0001)
ζ_{1t-3}	0.13363	(<.0001)	ζ_{1t-3}	0.10139	(<.0001)
			η_{1t-1}	0.12057	(<.0001)
			η_{1t-2}	0.04370	(<.0001)
			η_{1t-3}	0.03929	(<.0001)

Dependent Variable: ADR Returns

	Restricted Model			Unrestricted Model	
	Coeff.	P-Value		Coeff.	P-Value
ζ_0	0.00971	(<.0001)	ζ_0	0.00908	(<.0001)
ζ_{1t-1}	0.20573	(<.0001)	ζ_{1t-1}	0.05825	(<.0001)
ζ_{1t-2}	0.16266	(<.0001)	ζ_{1t-2}	0.03415	(<.0001)
ζ_{1t-3}	0.13651	(<.0001)	ζ_{1t-3}	0.03737	(<.0001)
			η_{1t-1}	0.16762	(<.0001)
			η_{1t-2}	0.13552	(<.0001)
			η_{1t-3}	0.10913	(<.0001)

Granger Causality: Security Returns

F-Test:	$F_{p,T-2p-1}$	2695.18‡
P Value:	P Value	(<.0001)

Granger Causality: Trading Volume

F-Test:	$F_{p,T-2p-1}$	970.63 ‡
P Value:	P Value	(<.0001)

	Restricted Model	Unrestricted Model
Equity Volume	$LV_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot LV_{it-j} + o_{it}$	$LV_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot LV_{it-j} + \sum_{j=1}^{j=p} \eta_j \cdot V_{it-j} + \pi_{it}$
ADR Volume	$V_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot V_{it-j} + o_{it}$	$V_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot V_{it-j} + \sum_{j=1}^{j=p} \eta_j \cdot LV_{it-j} + \pi_{it}$

Dependent Variable: Equity Volume

	Restricted Model			Unrestricted Model	
	Coeff.	P-Value		Coeff.	P-Value
ζ_0	0.00008	(<.0001)	ζ_0	0.00008	(<.0001)
ζ_{1t-1}	0.52727	(<.0001)	ζ_{1t-1}	0.53289	(<.0001)
ζ_{1t-2}	0.12654	(<.0001)	ζ_{1t-2}	0.12379	(<.0001)
ζ_{1t-3}	0.26171	(<.0001)	ζ_{1t-3}	0.25962	(<.0001)
			η_{1t-1}	0.00206	(<.0001)
			η_{1t-2}	-0.00053	(<.0001)
			η_{1t-3}	-0.00140	(<.0001)

Dependent Variable: ADR Volume

	Restricted Model			Unrestricted Model	
	Coeff.	P-Value		Coeff.	P-Value
ζ_0	0.00079	(<.0001)	ζ_0	0.00008	(<.0001)
ζ_{1t-1}	0.46542	(<.0001)	ζ_{1t-1}	-0.00401	(0.0506)
ζ_{1t-2}	0.19982	(<.0001)	ζ_{1t-2}	0.00098	(0.6715)
ζ_{1t-3}	0.22839	(<.0001)	ζ_{1t-3}	0.00258	(0.2040)
			η_{1t-1}	0.46548	(<.0001)
			η_{1t-2}	0.19983	(<.0001)
			η_{1t-3}	0.22832	(<.0001)

Granger Causality: Equity Trading Volume

F-Test:	$F_{p,T-2p-1}$	2.57 ‡
P Value:	P Value	(0.0524)

Granger Causality: ADR Trading Volume

F-Test:	$F_{p,T-2p-1}$	1.47
P Value:	P Value	(0.2212)

TABLE 4
GRANGER CAUSALITY TESTS OF CROSS-MARKET INFORMATION FLOW: SAMPLE FIRMS PARTITIONED BY SEC FORM 20-F ACCOUNTING PRINCIPLES CHOICE

Panel A: Local Accounting Standards Used As Basis Of Accounting For SEC Form 20-F Filing (SEC Form 20-F GAAP = 1)

	Restricted Model	Unrestricted Model
Security Returns	$LR_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot LR_{it-j} + o_{it}$	$LR_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot LR_{it-j} + \sum_{j=1}^{j=p} \eta_j \cdot R_{it-j} + \pi_{it}$
Trading Volume	$LV_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot LV_{it-j} + o_{it}$	$LV_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot LV_{it-j} + \sum_{j=1}^{j=p} \eta_j \cdot V_{it-j} + \pi_{it}$

Dependent Variable: Equity Security Returns

	Restricted Model			Unrestricted Model	
	Coeff.	P-Value		Coeff.	P-Value
ζ_0	0.01166	(<.0001)	ζ_0	0.01088	(<.0001)
ζ_{1t-1}	0.19754	(<.0001)	ζ_{1t-1}	0.07815	(<.0001)
ζ_{1t-2}	0.14877	(<.0001)	ζ_{1t-2}	0.09639	(<.0001)
ζ_{1t-3}	0.13790	(<.0001)	ζ_{1t-3}	0.09095	(<.0001)
			η_{1t-1}	0.14847	(<.0001)
			η_{1t-2}	0.05576	(<.0001)
			η_{1t-3}	0.04872	(<.0001)

Dependent Variable: ADR Returns

	Restricted Model			Unrestricted Model	
	Coeff.	P-Value		Coeff.	P-Value
ζ_0	0.01093	(<.0001)	ζ_0	0.01054	(<.0001)
ζ_{1t-1}	0.21169	(<.0001)	ζ_{1t-1}	0.06493	(<.0001)
ζ_{1t-2}	0.16187	(<.0001)	ζ_{1t-2}	0.04256	(<.0001)
ζ_{1t-3}	0.14030	(<.0001)	ζ_{1t-3}	0.03665	(<.0001)
			η_{1t-1}	0.15679	(<.0001)
			η_{1t-2}	0.12124	(<.0001)
			η_{1t-3}	0.10896	(<.0001)

Granger Causality: Equity Security Returns

F-Test:	$F_{p,T-2p-1}$	816.61‡
P Value:	P Value	(<.0001)

Granger Causality: ADR Returns

F-Test:	$F_{p,T-2p-1}$	224.93‡
P Value:	P Value	(<.0001)

	Restricted Model	Unrestricted Model
Security Returns	$LR_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot LR_{it-j} + o_{it}$	$LR_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot LR_{it-j} + \sum_{j=1}^{j=p} \eta_j \cdot R_{it-j} + \pi_{it}$
Trading Volume	$LV_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot LV_{it-j} + o_{it}$	$LV_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot LV_{it-j} + \sum_{j=1}^{j=p} \eta_j \cdot V_{it-j} + \pi_{it}$

Dependent Variable: Security Trading Volume

	Restricted Model			Unrestricted Model	
	Coeff.	P-Value		Coeff.	P-Value
ζ_0	0.00006984	(<.0001)	ζ_0	0.000038	(<.0001)
ζ_{1t-1}	0.74198	(<.0001)	ζ_{1t-1}	0.43252	(<.0001)
ζ_{1t-2}	-0.03008	(<.0001)	ζ_{1t-2}	0.11710	(<.0001)
ζ_{1t-3}	0.18139	(<.0001)	ζ_{1t-3}	0.27023	(<.0001)
			η_{1t-1}	0.000607	(<.0001)
			η_{1t-2}	-0.000001	(<.0001)
			η_{1t-3}	-0.000767	(<.0001)

Dependent Variable: ADR Trading Volume

	Restricted Model			Unrestricted Model	
	Coeff.	P-Value		Coeff.	P-Value
ζ_0	0.000692	(<.0001)	ζ_0	0.000691	(<.0001)
ζ_{1t-1}	0.48790	(<.0001)	ζ_{1t-1}	-0.09522	(0.0506)
ζ_{1t-2}	0.20407	(<.0001)	ζ_{1t-2}	-0.09408	(0.6715)
ζ_{1t-3}	0.22418	(<.0001)	ζ_{1t-3}	-0.01989	(0.2040)
			η_{1t-1}	0.48723	(<.0001)
			η_{1t-2}	0.20688	(<.0001)
			η_{1t-3}	0.21106	(<.0001)

Granger Causality: Security Trading Volume

F-Test:	$F_{p,T-2p-1}$	2.91‡
P Value:	P Value	(0.0330)

Granger Causality: ADR Trading Volume

F-Test:	$F_{p,T-2p-1}$	21.13‡
P Value:	P Value	(<.0001)

Panel B: IFRS Used As Basis Of Accounting For SEC Form 20-F Filing (SEC Form 20-F GAAP = 2)

	Dependent Variable: Security Returns						Dependent Variable: ADR Returns				
	Restricted Model			Unrestricted Model			Restricted Model			Unrestricted Model	
	Coeff.	P-Value		Coeff.	P-Value		Coeff.	P-Value		Coeff.	P-Value
ζ_0	0.00849	(<.0001)	ζ_0	0.00747	(<.0001)	ζ_0	0.00826	(<.0001)	ζ_0	0.00690	(<.0001)
ζ_{1t-1}	0.20113	(<.0001)	ζ_{1t-1}	0.08626	(<.0001)	ζ_{1t-1}	0.21017	(<.0001)	ζ_{1t-1}	0.11046	(0.0506)
ζ_{1t-2}	0.16996	(<.0001)	ζ_{1t-2}	0.08735	(<.0001)	ζ_{1t-2}	0.18503	(<.0001)	ζ_{1t-2}	0.07820	(0.6715)
ζ_{1t-3}	0.17242	(<.0001)	ζ_{1t-3}	0.11334	(<.0001)	ζ_{1t-3}	0.16454	(<.0001)	ζ_{1t-3}	0.07585	(0.2040)
			η_{1t-1}	0.14517	(<.0001)				η_{1t-1}	0.13744	(<.0001)
			η_{1t-2}	0.09227	(<.0001)				η_{1t-2}	0.12705	(<.0001)
			η_{1t-3}	0.05751	(<.0001)				η_{1t-3}	0.10911	(<.0001)

	Granger Causality: Security Returns				Granger Causality: ADR Returns	
F-Test:	$F_{p,T-2p-1}$	1092.06‡		F-Test:	$F_{p,T-2p-1}$	621.17‡
P Value:	P Value	(<.0001)		P Value:	P Value	(<.0001)

	Dependent Variable: Security Trading Volume						Dependent Variable: ADR Trading Volume				
	Restricted Model			Unrestricted Model			Restricted Model			Unrestricted Model	
	Coeff.	P-Value		Coeff.	P-Value		Coeff.	P-Value		Coeff.	P-Value
ζ_0	0.000171	(<.0001)	ζ_0	0.000044	(<.0001)	ζ_0	0.000625	(<.0001)	ζ_0	0.000714	(<.0001)
ζ_{1t-1}	0.58864	(<.0001)	ζ_{1t-1}	0.54781	(<.0001)	ζ_{1t-1}	0.48430	(<.0001)	ζ_{1t-1}	-0.01062	(0.0506)
ζ_{1t-2}	0.11615	(<.0001)	ζ_{1t-2}	0.13315	(<.0001)	ζ_{1t-2}	0.18440	(<.0001)	ζ_{1t-2}	0.00771	(0.6715)
ζ_{1t-3}	0.22159	(<.0001)	ζ_{1t-3}	0.24148	(<.0001)	ζ_{1t-3}	0.23305	(<.0001)	ζ_{1t-3}	0.01607	(0.2040)
			η_{1t-1}	0.01466	(<.0001)				η_{1t-1}	0.47121	(<.0001)
			η_{1t-2}	-0.01196	(<.0001)				η_{1t-2}	0.16444	(<.0001)
			η_{1t-3}	0.00753	(<.0001)				η_{1t-3}	0.24457	(<.0001)

	Granger Causality: Security Trading Volume				Granger Causality: ADR Trading Volume	
F-Test:	$F_{p,T-2p-1}$	18.09‡		F-Test:	$F_{p,T-2p-1}$	7.19‡
P Value:	P Value	(<.0001)		P Value:	P Value	(<.0001)

Panel C: U.S. GAAP Used As Basis Of Accounting For SEC Form 20-F Filing (SEC Form 20-F GAAP = 3)

	Dependent Variable: Security Returns						Dependent Variable: ADR Returns				
	Restricted Model			Unrestricted Model			Restricted Model			Unrestricted Model	
	Coeff.	P-Value		Coeff.	P-Value		Coeff.	P-Value		Coeff.	P-Value
ζ_0	0.00864	(<.0001)	ζ_0	0.00719	(<.0001)	ζ_0	0.00880	(<.0001)	ζ_0	0.00767	(<.0001)
ζ_{1t-1}	0.18945	(<.0001)	ζ_{1t-1}	0.10114	(<.0001)	ζ_{1t-1}	0.19803	(<.0001)	ζ_{1t-1}	0.06861	(0.0506)
ζ_{1t-2}	0.15812	(<.0001)	ζ_{1t-2}	0.11080	(<.0001)	ζ_{1t-2}	0.17532	(<.0001)	ζ_{1t-2}	0.04921	(0.6715)
ζ_{1t-3}	0.15923	(<.0001)	ζ_{1t-3}	0.11986	(<.0001)	ζ_{1t-3}	0.14045	(<.0001)	ζ_{1t-3}	0.05939	(0.2040)
			η_{1t-1}	0.13489	(<.0001)				η_{1t-1}	0.15560	(<.0001)
			η_{1t-2}	0.05973	(<.0001)				η_{1t-2}	0.13900	(<.0001)
			η_{1t-3}	0.04439	(<.0001)				η_{1t-3}	0.10509	(<.0001)

	Granger Causality: Security Returns				Granger Causality: ADR Returns	
F-Test:	$F_{p,T-2p-1}$	957.12‡		F-Test:	$F_{p,T-2p-1}$	440.97‡
P Value:	P Value	(<.0001)		P Value:	P Value	(<.0001)

Dependent Variable: Security Trading Volume

	Restricted Model			Unrestricted Model	
	Coeff.	P-Value		Coeff.	P-Value
ζ_0	0.000164	(<.0001)	ζ_0	0.000078	(<.0001)
ζ_{1t-1}	0.52447	(<.0001)	ζ_{1t-1}	0.61805	(<.0001)
ζ_{1t-2}	0.11746	(<.0001)	ζ_{1t-2}	0.06914	(<.0001)
ζ_{1t-3}	0.29074	(<.0001)	ζ_{1t-3}	0.23512	(<.0001)
			η_{1t-1}	0.00253	(<.0001)
			η_{1t-2}	0.000122	(<.0001)
			η_{1t-3}	-0.00310	(<.0001)

Dependent Variable: ADR Trading Volume

	Restricted Model			Unrestricted Model	
	Coeff.	P-Value		Coeff.	P-Value
ζ_0	0.00119	(<.0001)	ζ_0	0.000895	(<.0001)
ζ_{1t-1}	0.44950	(<.0001)	ζ_{1t-1}	-0.00807	(0.0506)
ζ_{1t-2}	0.22015	(<.0001)	ζ_{1t-2}	0.00743	(0.6715)
ζ_{1t-3}	0.22262	(<.0001)	ζ_{1t-3}	0.000017	(0.2040)
			η_{1t-1}	0.43858	(<.0001)
			η_{1t-2}	0.22289	(<.0001)
			η_{1t-3}	0.22612	(<.0001)

Granger Causality: Security Trading Volume

F-Test:	$F_{p,T-2p-1}$	0.98
P Value:	P Value	(0.4021)

Granger Causality: ADR Trading Volume

F-Test:	$F_{p,T-2p-1}$	0.81
P Value:	P Value	(0.4876)

TABLE 5
GRANGER CAUSALITY TESTS OF CROSS-MARKET INFORMATION FLOW: SEC FORM 20-F FILING DATE ONLY WITH SAMPLE FIRMS PARTITIONED BY SEC FORM 20-F ACCOUNTING PRINCIPLES CHOICE

Panel A: Local Accounting Standards Used As Basis of Accounting For SEC Form 20-F Filing (SEC Form 20-F GAAP = 1)

	Restricted Model	Unrestricted Model
Security Returns	$LR_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot LR_{it-j} + o_{it}$	$LR_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot LR_{it-j} + \sum_{j=1}^{j=p} \eta_j \cdot R_{it-j} + \pi_{it}$
Trading Volume	$LV_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot LV_{it-j} + o_{it}$	$LV_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot LV_{it-j} + \sum_{j=1}^{j=p} \eta_j \cdot V_{it-j} + \pi_{it}$

Dependent Variable: Equity Security Returns

	Restricted Model			Unrestricted Model	
	Coeff.	P-Value		Coeff.	P-Value
ζ_0	0.01323	(<.0001)	ζ_0	0.01286	(<.0001)
ζ_{1t-1}	0.21828	(<.0001)	ζ_{1t-1}	0.10095	(0.0162)
ζ_{1t-2}	0.06804	(0.0050)	ζ_{1t-2}	0.03055	(0.4417)
ζ_{1t-3}	0.14013	(<.0001)	ζ_{1t-3}	0.14474	(0.0005)
			η_{1t-1}	0.14999	(0.0002)
			η_{1t-2}	0.0382	(0.3286)
			η_{1t-3}	-0.02509	(0.5376)

Dependent Variable: ADR Returns

	Restricted Model			Unrestricted Model	
	Coeff.	P-Value		Coeff.	P-Value
ζ_0	0.01215	(<.0001)	ζ_0	0.01209	(<.0001)
ζ_{1t-1}	0.27265	(<.0001)	ζ_{1t-1}	0.11295	(0.0088)
ζ_{1t-2}	0.07647	(0.0004)	ζ_{1t-2}	0.02988	(0.4653)
ζ_{1t-3}	0.13006	(<.0001)	ζ_{1t-3}	0.11505	(0.0066)
			η_{1t-1}	0.16569	(<.0001)
			η_{1t-2}	0.04176	(0.3011)
			η_{1t-3}	0.01867	(0.6555)

Granger Causality: Equity Security Returns

F-Test:	$F_{p,T-2p-1}$	5.04‡
P Value:	P Value	(0.0018)

Granger Causality: ADR Returns

F-Test:	$F_{p,T-2p-1}$	4.93
P Value:	P Value	(0.0021)

	Restricted Model	Unrestricted Model
Security Returns	$LR_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot LR_{it-j} + o_{it}$	$LR_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot LR_{it-j} + \sum_{j=1}^{j=p} \eta_j \cdot R_{it-j} + \pi_{it}$
Trading Volume	$LV_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot LV_{it-j} + o_{it}$	$LV_{it} = \zeta_0 + \sum_{j=1}^{j=p} \zeta_j \cdot LV_{it-j} + \sum_{j=1}^{j=p} \eta_j \cdot V_{it-j} + \pi_{it}$

Dependent Variable: Security Trading Volume

	Restricted Model			Unrestricted Model	
	Coeff.	P-Value		Coeff.	P-Value
ζ_0	-0.0001	(0.0046)	ζ_0	0.00001	(0.3445)
ζ_{1t-1}	0.39419	(<.0001)	ζ_{1t-1}	0.41517	(<.0001)
ζ_{1t-2}	-0.7416	(<.0001)	ζ_{1t-2}	0.32552	(<.0001)
ζ_{1t-3}	1.92669	(<.0001)	ζ_{1t-3}	0.10384	(0.0008)
			η_{1t-1}	0.00060	(0.7538)
			η_{1t-2}	-0.0044	(0.0277)
			η_{1t-3}	0.00411	(0.0220)

Dependent Variable: ADR Trading Volume

	Restricted Model			Unrestricted Model	
	Coeff.	P-Value		Coeff.	P-Value
ζ_0	0.00038	(0.1699)	ζ_0	0.00064	(0.0830)
ζ_{1t-1}	0.54205	(<.0001)	ζ_{1t-1}	-0.3425	(0.6684)
ζ_{1t-2}	0.20990	(<.0001)	ζ_{1t-2}	0.06602	(0.9369)
ζ_{1t-3}	0.19339	(<.0001)	ζ_{1t-3}	0.06444	(0.9131)
			η_{1t-1}	0.57868	(<.0001)
			η_{1t-2}	0.05953	(0.1202)
			η_{1t-3}	0.24844	(<.0001)

Granger Causality: Security Trading Volume

F-Test:	$F_{p,T-2p-1}$	2.23
P Value:	P Value	(0.0836)

Granger Causality: ADR Trading Volume

F-Test:	$F_{p,T-2p-1}$	0.12
P Value:	P Value	(0.9501)

Dependent Variable: Security Returns

	Restricted Model			Unrestricted Model	
	Coeff.	P-Value		Coeff.	P-Value
ζ_0	0.00923	(<.0001)	ζ_0	0.00776	(<.0001)
ζ_{1t-1}	0.17855	(<.0001)	ζ_{1t-1}	0.10850	(0.0188)
ζ_{1t-2}	0.13529	(0.0002)	ζ_{1t-2}	0.09338	(0.0368)
ζ_{1t-3}	0.17911	(<.0001)	ζ_{1t-3}	0.09417	(0.0354)
			η_{1t-1}	0.13318	(0.0014)
			η_{1t-2}	-0.0299	(0.4280)
			η_{1t-3}	0.15217	(<.0001)

Dependent Variable: ADR Returns

	Restricted Model			Unrestricted Model	
	Coeff.	P-Value		Coeff.	P-Value
ζ_0	0.00780	(<.0001)	ζ_0	0.00489	(<.0001)
ζ_{1t-1}	0.18648	(<.0001)	ζ_{1t-1}	0.25493	(<.0001)
ζ_{1t-2}	0.08332	(0.0082)	ζ_{1t-2}	0.17954	(0.0001)
ζ_{1t-3}	0.28216	(<.0001)	ζ_{1t-3}	0.01975	(0.6707)
			η_{1t-1}	0.02458	(0.5655)
			η_{1t-2}	-0.0238	(0.5474)
			η_{1t-3}	0.26057	(<.0001)

Granger Causality: Security Returns

F-Test:	$F_{p,T-2p-1}$	8.29‡
P Value:	P Value	(<.0001)

Granger Causality: ADR Returns

F-Test:	$F_{p,T-2p-1}$	14.90‡
P Value:	P Value	(<.0001)

Dependent Variable: Security Trading Volume

	Restricted Model			Unrestricted Model	
	Coeff.	P-Value		Coeff.	P-Value
ζ_0	0.00042	(0.1103)	ζ_0	0.00034	(0.2826)
ζ_{1t-1}	0.55341	(<.0001)	ζ_{1t-1}	0.55196	(<.0001)
ζ_{1t-2}	-0.0189	(0.3095)	ζ_{1t-2}	0.02248	(0.3105)
ζ_{1t-3}	0.33144	(<.0001)	ζ_{1t-3}	0.28218	(<.0001)
			η_{1t-1}	0.06845	(0.0046)
			η_{1t-2}	-0.1482	(0.0003)
			η_{1t-3}	0.10524	(0.0308)

Dependent Variable: ADR Trading Volume

	Restricted Model			Unrestricted Model	
	Coeff.	P-Value		Coeff.	P-Value
ζ_0	0.00063	(0.2391)	ζ_0	0.00083	(0.3684)
ζ_{1t-1}	0.27605	(<.0001)	ζ_{1t-1}	-0.0106	(0.0818)
ζ_{1t-2}	0.43717	(<.0001)	ζ_{1t-2}	-0.1183	(0.1006)
ζ_{1t-3}	0.25981	(<.0001)	ζ_{1t-3}	0.29690	(0.1208)
			η_{1t-1}	0.22964	(0.0003)
			η_{1t-2}	0.30584	(0.0093)
			η_{1t-3}	0.46117	(0.0010)

Granger Causality: Security Trading Volume

F-Test:	$F_{p,T-2p-1}$	5.76‡
P Value:	P Value	(0.0008)

Granger Causality: ADR Trading Volume

F-Test:	$F_{p,T-2p-1}$	3.23‡
P Value:	P Value	(0.0230)

Panel C: U.S. GAAP Used As Basis Of Accounting For SEC Form 20-F Filing (SEC Form 20-F GAAP = 3)

	Dependent Variable: Security Returns						Dependent Variable: ADR Returns				
	Restricted Model			Unrestricted Model			Restricted Model			Unrestricted Model	
	Coeff.	P-Value		Coeff.	P-Value		Coeff.	P-Value		Coeff.	P-Value
ζ_0	0.00477	(0.0003)	ζ_0	0.00246	(0.0519)	ζ_0	0.00714	(<.0001)	ζ_0	0.00641	(<.0001)
ζ_{1t-1}	0.32916	(<.0001)	ζ_{1t-1}	-0.1376	(0.0061)	ζ_{1t-1}	0.13189	(<.0001)	ζ_{1t-1}	0.15244	(0.0035)
ζ_{1t-2}	0.27006	(<.0001)	ζ_{1t-2}	0.09141	(0.0870)	ζ_{1t-2}	0.26705	(<.0001)	ζ_{1t-2}	-0.0154	(0.7798)
ζ_{1t-3}	0.23969	(<.0001)	ζ_{1t-3}	0.08862	(0.1056)	ζ_{1t-3}	0.24750	(<.0001)	ζ_{1t-3}	0.08762	(0.1208)
			η_{1t-1}	0.54282	(<.0001)				η_{1t-1}	0.02941	(0.5394)
			η_{1t-2}	0.19808	(<.0001)				η_{1t-2}	0.26562	(<.0001)
			η_{1t-3}	0.13743	(0.0083)				η_{1t-3}	0.18938	(0.0004)

Granger Causality: Security Returns			Granger Causality: ADR Returns		
F-Test:	$F_{p,T-2p-1}$	55.49‡	F-Test:	$F_{p,T-2p-1}$	3.73‡
P Value:	P Value	(<.0001)	P Value:	P Value	(0.0110)

	Dependent Variable: Security Trading Volume						Dependent Variable: ADR Trading Volume				
	Restricted Model			Unrestricted Model			Restricted Model			Unrestricted Model	
	Coeff.	P-Value		Coeff.	P-Value		Coeff.	P-Value		Coeff.	P-Value
ζ_0	0.00045	(0.3087)	ζ_0	0.00001	(0.9763)	ζ_0	0.00199	(0.0003)	ζ_0	0.00166	(0.0061)
ζ_{1t-1}	0.23398	(<.0001)	ζ_{1t-1}	0.30410	(<.0001)	ζ_{1t-1}	0.51663	(<.0001)	ζ_{1t-1}	0.04662	(0.4604)
ζ_{1t-2}	0.13406	(<.0001)	ζ_{1t-2}	-0.0970	(0.0032)	ζ_{1t-2}	0.16985	(<.0001)	ζ_{1t-2}	-0.1171	(0.3312)
ζ_{1t-3}	0.14443	(<.0001)	ζ_{1t-3}	0.44014	(<.0001)	ζ_{1t-3}	0.18144	(<.0001)	ζ_{1t-3}	0.00844	(0.9048)
			η_{1t-1}	0.04641	(0.0356)				η_{1t-1}	0.61523	(<.0001)
			η_{1t-2}	-0.0106	(0.6461)				η_{1t-2}	0.24334	(<.0001)
			η_{1t-3}	-0.0238	(0.2206)				η_{1t-3}	0.03260	(0.4046)

Granger Causality: Security Trading Volume			Granger Causality: ADR Trading Volume		
F-Test:	$F_{p,T-2p-1}$	1.67	F-Test:	$F_{p,T-2p-1}$	1.67
P Value:	P Value	(0.1722)	P Value:	P Value	(0.1717)

ER_{it}: Percentage change in the daily spot home currency to U.S. dollar exchange rate.