# CONSEQUENCES OF ACCOUNTING HARMONIZATION: IFRS ADOPTION AND CROSS-BORDER CONTAGION

by

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## DEDICATION

I dedicate this dissertation to my parents, George and Despina, my παππού, my sisters Vicky and Maree, and to my family and close friends both in the U.S. and Australia. Their support throughout the Ph.D. process made it all possible.

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## ABSTRACT

This study examines the impact of accounting harmonization on cross-border capital market contagion. Employing a sample of approximately 14,000 firms across 35 countries for the period 2001-2010, I document an increase in cross-border contagion amongst IFRS adopting markets. After controlling for common macro-level exposures and bilateral trade linkages, I find significant clustering in the incidence of extreme negative market returns across IFRS adopting countries, relative to the clustering observed across non-adopting countries. Providing further insight, I show that liquidity shocks—captured by the volatility of liquidity—originating in foreign markets have a significantly greater impact on the variability of local market liquidity when both the foreign and local markets follow IFRS. Cross-sectional analysis of IFRS adopters shows my documented contagion results are more pronounced within countries that experienced the greatest increase in foreign portfolio investment around the adoption of IFRS. Conversely, the observed impact of foreign liquidity shocks on local markets is attenuated in countries that experienced the greatest increase in reporting transparency post-IFRS adoption. These results are robust to several sensitivity tests and alternative specifications. Taken together, the evidence presented in this study suggests that equity market integration associated with IFRS adoption also imposes a significant market cost by opening local markets to foreign idiosyncratic shocks.

# Chapter 1

## Introduction

The wide-spread adoption of International Financial Reporting Standards (IFRS) facilitated the harmonization of accounting standards around the globe. Accounting research has documented a variety of financial reporting, capital market, and contracting outcomes associated with the adoption of IFRS (see Bruggemann et al. [2012] for a review). One particularly well documented outcome is the integration of capital markets via increases in cross-border equity investment and the globalization of investor bases (e.g., Amiram [2012], Florou and Pope [2012], Yu [2011]). Existing literature suggests that this has been beneficial to adopting firms, citing an increase in market liquidity, greater access to capital, and improvements in investor information environments. However, while prior accounting research has focused on these benefits, a long line of research (primarily in economics and finance) argues that as equity markets become more integrated they are increasingly exposed to the risk of cross-border capital market contagion (e.g. Bekaert et al. [2005]). The objective of this study is to examine whether the global convergence of accounting practices is associated with increases in the risk of cross-border equity market contagion. Specifically, I document that local equity markets tend to move more closely with foreign

equity markets following the harmonization of their respective accounting standards, i.e. when both countries follow IFRS. Given the increased co-movement is isolated to periods of significant market downturn I interpret this clustering as evidence of cross-border contagion, suggesting the harmonization of accounting standards carries a significant capital market cost.

Cross-border contagion arises when adverse localized shocks in one capital market are transmitted to other markets beyond what economic fundamentals would suggest (Pritsker [2001]; Bekaert et al. [2005]). Cross-border contagion imposes significant costs on domestic markets by reducing the effects of local policy, increasing volatility, and effectively opening them up to the risk of foreign shocks (Bekaert et al. [2005]). Interestingly, such concerns were raised by a number of countries initially opposed to the adoption of IFRS. For instance Japan and a number of Latin American countries explicitly cited the potential introduction of excess volatility in their markets brought about by risky foreign capital flows as one of the reasons to temporarily or permanently delay the adoption of IFRS.

I argue that the harmonization of accounting standards increases the risk of cross-border contagion among IFRS adopting markets mainly due to the mixing of investor bases, illustrated via two main channels. First, it has been shown that investors respond to localized market shocks (e.g., liquidity) by selling or rebalancing their holdings in other markets (Brunnermeier and Pederson [2009], Kyle and Xiong [2001], Pritsker and Kodres [2002]). This wealth-effect response puts undue pressure on the prices of firms

traded in those markets, unrelated to their fundamentals. To the extent that investors hold globalized portfolios they will transmit local adverse shocks to the foreign markets in which they invest and contagion will ensue. Given IFRS adoption has been shown to promote significant cross-border investment among adopting markets, this mixing of investor bases likely exacerbates this channel of cross-border contagion.

Second, harmonizing the accounting practices of many countries provides investors the means to extrapolate financial information across national borders. Prior studies suggest investors perceive IFRS adoption to increase comparability (DeFond et al. [2011]), however it remains unclear as to whether this increased comparability better captures the true fundamental correlation between firms. This suggests that contagion may also propagate when global investors extract different signals from country-specific adverse shocks and overestimate the potential effect on other countries (Pritsker [2001], Claessens and Forbes [2001]), thus increasing the risk of contagion amongst IFRS adopters.

It is important to note that in my setting contagion is characterized independent of the evolution of fundamentals. Therefore, the co-movement in prices I observe requires downward sloping demand curves, contrary to the traditional assumptions of the CAPM.[1]

I employ two established empirical measures to capture cross-border contagion. First, I follow a more traditional empirical definition of contagion (e.g. Bekaert et al.

[1] Prior studies provide empirical evidence consistent with this notion (e.g. Shleifer [1986], Petajisto [2009]).

[2005], Boyson et al. [2010]), and study the excess correlation among market returns around extreme negative events, i.e. market returns in the bottom decile of their respective time-series distribution. Consistent with prior literature, I term this "worst return" contagion. Importantly, I utilize excess returns that are orthogonal to changes in global risk factors or country-level fundamentals, consistent with my working definition of contagion. This empirical characterization allows me to capture differences in the clustering of excess returns among markets around extreme negative return periods. The next part of my identification strategy exploits variation in country level adoption dates to capture whether IFRS adoption exacerbates the observed cross-border contagion, relative to a non-adopting baseline. If harmonization of accounting standards exacerbates cross-border contagion, I expect the excess co-movement in worst returns amongst IFRS adopting countries to exceed that observed amongst other countries. This design also provides comfort that results are implicitly driven by my channel of interest, i.e., the mixing of investor bases among IFRS adopting countries, in that focusing on negative return periods provides a binding constraint (e.g. margin calls, or general consumption needs) on globalized investors' to trade within their portfolios to cover their losses, hence I capture short-run clustering in negative returns among markets.

Second, I examine an established mechanism underpinning the propagation of return contagion, namely the spread of liquidity shocks across markets ("liquidity contagion"). Consistent with prior literature, I capture adverse shocks to liquidity via

measures of liquidity volatility (e.g., Rigobon [2003], Maffett and Lang [2012]), and examine the differential association between foreign and local market level liquidity variability among IFRS and non-IFRS adopting markets.[3] To the extent that adverse liquidity shocks are more easily transmitted across national borders following the harmonization of accounting standards, I expect to observe that the relation between changes in the liquidity of local and foreign markets will be much more pronounced following the adoption of IFRS. Moreover, after controlling for bilateral economic and trade linkages that might explain variation in foreign equity investment flows, I expect that the impact of foreign liquidity shocks on local markets will be much more pronounced between IFRS adopting countries relative to non-adopting countries.

I test my predictions using a dataset of weekly data from approximately 14,000 firms located within 35 countries for the period 2001-2010. A feature of my design is that I limit my sample to locally traded stocks and remove corporations that are traded on multiple exchanges before computing my country-level return and liquidity measures. This ensures my results are not simply driven by the subset of large firms whose prices tend to move more with shifts in macro fundamentals, or cross-listed firms who are more likely to have globalized investor bases independent of the adoption of IFRS.[4]

[3] While the measurement of much broader notions of return contagion is hotly debated (see Forbes [2012] for an excellent review), there is a greater consensus in the literature regarding the well-established proxies that capture liquidity volatility, allowing for a cleaner research design to further corroborate evidence of cross-border contagion.

[4] In addition, this also addresses recent calls for greater insight into IFRS impacts on smaller firms (see Bruggemann et al. [2012]).

Consistent with my first prediction, I document an increased *worst return* contagion amongst IFRS countries immediately following the passage of IFRS, over and above that experienced by non-adopting countries. Results suggest that IFRS adopting jurisdictions exhibit an average of 42% more clustering of worst returns, relative to non-adopting countries, meaning that IFRS adopters are significantly more likely to experience negative price movements due to cross-border contagion. Moreover, the clustering is only weakly evident – almost four times smaller – in upside returns (i.e. returns in the top decile of their return distributions) suggesting that my documented contagion result is not simply a shift in cross-market interdependence between countries, but concentrated clustering during negative states of the world. Consistent with my second prediction, I find that liquidity shocks originating in foreign markets are associated with a significantly greater impact—approximately twice as large—on the variability of local market liquidity when both foreign and local markets follow IFRS. These findings suggest that IFRS adoption exposes domestic markets to an increased risk of contagion, as local returns and liquidity are now more susceptible to volatility stemming from adverse foreign market conditions, unrelated to local fundamentals. The increased comovement across markets likely harms investors by increasing the volatility of markets and reducing the benefits of international diversification.[5]

[5] Interestingly, when I construct country level indexes based only on cross-listed firms – which are removed from my final sample – the cross-country correlations between pairs of IFRS adopters and pairs of non-adopters reveal no significant increases (or decreases) in contagion. This is consistent with the mechanism argued in this paper in that these firms already have globalized investor bases, and thus are already susceptible to contagion. Moreover, review of a random sample of cross-listed

To gain further insight and corroborate my main findings, I test the relation between the cross-sectional variation in the intensity of observed cross-border contagion and the country specific effects of accounting harmonization. First, given that the extent of foreign investment is a key ingredient underpinning the propagation of liquidity shocks through wealth effects, I expect the observed strength of cross-border contagion to be more pronounced in countries that experienced the greatest increase in foreign investment following IFRS adoption (i.e., an *integration effect*). Consistent with this prediction, cross-sectional analysis reveals that the documented cross-border contagion effects are more pronounced—two to five times the magnitude—within countries that experienced the greatest increase in foreign portfolio investment (FPI) around the adoption of IFRS. This evidence suggests that the benefits associated with additional access to foreign capital (i.e. the documented increase in liquidity *levels* in Daske et al. [2008]) come with a significant cost as globalized investor bases of local firms and markets increase their exposure to adverse foreign market shocks. In addition, given the partitioning variable is FPI changes immediately following the adoption of IFRS, such a result also provides comfort that the observed contagion is likely attributable to the process of accounting harmonization.

Second, as IFRS is generally seen to be of higher reporting quality and more transparent than local GAAP (Li [2010], Barth et al. [2008]), I expect the observed contagion results to be attenuated for firms in countries which experienced the greatest

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firms reveals they experience significantly smaller increases in foreign institutional ownership relative to locally listed firms, around the time of IFRS adoption.

increase in transparency post-IFRS. This prediction is motivated by theory that suggests that asset transparency (i.e., transparent financial reporting) may mitigate the spread of liquidity shocks. Specifically, when faced with a liquidity shock, investors will exhibit a "flight to quality" and shy away from assets about which they are more uncertain regarding fundamental value. To the extent that IFRS better maps to economic fundamentals and increases the transparency of financial information relative to previous accounting standards, investors will be less likely to liquidate holdings in firms from IFRS adopting markets when forced to re-balance. Partitioning the sample into high and low transparency countries I document that the observed clustering in worst returns and the incremental impact of foreign liquidity shocks on local markets is significantly attenuated—an almost four-fold decrease—in countries with the greatest post-IFRS transparency.[6] Taken together, my empirical findings are consistent with an economically significant capital market cost imposed on IFRS adopting markets in the form of cross-border contagion.

However, my results must be interpreted with some caution given the following caveats. As with most studies examining the impacts of mandatory IFRS adoption, the clustering of mandated adoption dates in time make it difficult to eliminate the confounding effects of unrelated economic shocks, trade linkages, and changes in institutions. That said, my design attempts to mitigate these concerns by: (1) filtering

[6] Adding validity to my inferences on incremental effect of IFRS reporting transparency, I find insignificant difference across my sub-samples in the *overall* average effect of transparency on cross-border contagion measures for IFRS adopters, suggesting unobserved heterogeneity across my sub-samples is not driving my results.

returns for common exposures and macro fundamentals, (2) controlling for trade linkages and enforcement regimes, and (3) leveraging variation in adoption dates by incorporating adopting and non-adopting countries outside the E.U. In addition, my cross-sectional tests are introduced to provide evidence of plausible cross-sectional variation in the intensity of cross-border contagion related to country-specific IFRS impacts resulting from the process of accounting harmonization. Further, my inferences are robust to both E.U. and non-E.U. countries, and are robust to the removal of countries identified as having concurrent changes in enforcement. Lastly, while I empirically document evidence of contagion among IFRS adopting markets, this paper is silent on the overall welfare effects of the IFRS mandate. That is, my results should not be viewed in isolation from other studies that document significant capital market benefits of IFRS adoption.

A potential threat to the internal validity of this study also arises if, at the country level, the decision to adopt IFRS may have been part of larger integration policy and it is these other liberalization policies adopted around the time of IFRS that is driving the observed contagion (see Ramanna and Sletten [2012] for an excellent discussion of country level adoption factors). While I acknowledge the potential issue of endogeneity, I attempt to control for observable characteristics correlated with the economic trends (that may have given rise to adoption) between countries in order to isolate the impact of IFRS. Moreover, Ramanna and Sletten [2012] do not find any significant association

between the *decision* to adopt IFRS and the current or expected foreign trade and investment flows.

Notwithstanding, this study contributes to the literature in four distinct ways. First, I document an important consequence of the integration of equity markets facilitated by IFRS adoption. My results are consistent with IFRS opening up local markets to foreign sources of risk, particularly return contagion and the associated spread of foreign liquidity shocks. Second, my empirical analysis builds on emerging research suggesting that firms reporting under IFRS or US GAAP are shielded from market level liquidity shocks (Lang and Maffett [2011]). While a global investor base may provide a benefit for firms in the presence of *localized* liquidity shocks, it may prove to be significantly detrimental, from a market perspective, in the presence of *foreign* liquidity shocks. Third, the results in this study are salient to recent debates over the diversification afforded by international portfolio strategies. While correlations among international equity returns have generally been low, my results suggest that the wide spread adoption of IFRS may reduce the country-level diversification benefits of international portfolio investment. Moreover, the nature of the documented contagion in returns means that precisely *when* diversification should offer the most benefit to investors (i.e., market downturns) the correlation in returns across IFRS adopting countries is the strongest.

Finally, prior studies tend to focus on the relation between IFRS and average level of liquidity (Daske et al. [2008], Platikanova and Perramon [2009]), generally finding an

increase in market liquidity immediately following adoption. However, the much broader concern for investors is not simply the average level of liquidity, but its variability and uncertainty (Persuad [2003]). My results suggest that liquidity variability increases post-IFRS adoption, as local markets are more susceptible to adverse liquidity shocks in foreign markets.

The rest of the paper proceeds as follows: section 2 describes the prior literature with respect to IFRS adoption and market integration, and also defines my notion of cross-border contagion; section 3 discusses the relevant research designs for my return and liquidity contagion tests; section 4 describes the data collection process; section 5 presents empirical results and discussion.

# Chapter 2

# Background and Predictions

*2.1. IFRS and market integration*

A number of studies have argued that cross-border contagion arises as markets become more integrated. Therefore, a necessary condition for accounting harmonization to increase cross-border contagion is that it must integrate the capital markets. In line with this, I briefly summarize the literature and evidence on IFRS adoption and cross-border equity market investment.

Traditional understanding of the observed (low) levels of cross-border equity investment was based on the premise that local investors have an informational advantage over foreign investors (Kang and Stulz [1997]). Accounting impacts the level of cross-border investment as significant differences in financial reporting standards may exacerbate this information asymmetry. Investors have to devote significant amounts of time and effort to decoding foreign Generally Accepted Accounting Principles ("GAAP"), and thus will incur greater costs than local investors and be at an informational disadvantage when investing in countries with different accounting standards (Chen et al. [2011]). Existing literature argues convergence in accounting practices can lower the cost of acquiring and processing information for international

investors (e.g., Bradshaw et al. [2004]). Following this logic, IFRS adoption will move foreign stocks into investors' choice sets by replacing unfamiliar country-specific reporting standards with a single set of standards that investors are able to familiarize themselves with at a lower cost; reducing the differential costs between foreign and local investors (Yu [2011]), and allowing foreign investors to be more confident in their ability to assess foreign markets (Amiram [2012]). In addition, IFRS are generally seen to be of higher quality than local GAAP (Barth et al. [2008]); this may further reduce the information asymmetry between local and foreign investors, and increase foreign investment within IFRS adopting countries.

Empirical evidence consistent with these arguments begins with Covrig et al. [2008] who show that foreign mutual funds significantly increase their ownership in firms that voluntarily switch to IAS, while domestic mutual funds do not.[7] Similar results are also observed following the mandatory adoption of IFRS (e.g., Yu [2011] and Florou and Pope [2012]), with the most pronounced increase in foreign investment experienced by those countries which were most dissimilar pre-convergence, and those having the strongest enforcement institutions in place. Consistent with these investment patterns, DeFond et al. [2011] provides evidence that the preference of international (institutional) investors towards IFRS is due to increased comparability.

[7] Note that IAS were issued by the International Accounting Standards Committee (IASC) until 2001. The IASC was then succeeded by the International Accounting Standards Board (IASB) who issue IFRS. These IFRS include those issued not only by the IASB but also by the IASC, some of which have been amended by the IASB. Throughout this paper, I use the acronym IFRS to describe both IAS and IFRS. Note that over 120 countries mandate direct use of IFRS or use of country-specific equivalents.

Building on this result, Jayaraman and Verdi [2013] find that accounting comparability is, at least partially, associated with greater cross-border arm's length financing, indicating that the extent of bilateral investment and the extent of accounting comparability may be reinforcing.

Switching to retail investor trade data, Bruggemann et al. [2012] find retail investors located within an IFRS adopting jurisdiction exhibit a preference for foreign stocks that also adopt IFRS.[8] While Amiram [2012] takes a broader perspective using country-level Foreign Portfolio Investment (FPI) data, and finds a significant increase in cross-border investment between IFRS adopting countries after controlling for bilateral trade linkages. A result he attributes to familiarity of accounting standards.

In addition to equity investment outcomes, studies have also shown that the harmonization of accounting standards has enabled other users the ability to extrapolate financial information across national borders. For instance, Alves et al. [2008] shows that following the adoption of IFRS, equity analysts are increasingly using globally-defined peer groups in place of the same country comparators when implementing multiples-based valuation methods. While anecdotal evidence suggests that investors and compensation committees are also redefining and expanding peer groups when evaluating CEO performance.

[8] Interestingly, this effect is limited to international stocks that grab retail investors' attention, consistent with Merton [1987]. In the case of individual investors, cross-border investment does not materialize consistently across all stocks due to their limited attention.

Overall, there is a growing empirical consensus that IFRS adoption is associated with financial markets integration, as evidenced by the direct increase in cross-border equity investments amongst IFRS adopters and the ability of investors to evaluate investments on a global perspective. Moreover, the globalization of investor bases appears to be attributable to both institutional and retail investors.

*2.2. Market integration and cross-border contagion*

Financial markets have long been recognized as major avenues for contagion. Despite the wide array of literature on this subject matter within finance and economics, there is no consensus economic definition or consensus empirical interpretation of what constitutes contagion. Contagion, in general, refers to the spread of market disturbances (almost exclusively on the downside and around crises) from one country to the other in the form of co-movements in exchange rates, stock prices, sovereign spreads and capital flows (see Karolyi [2003] and Forbes [2012] for a review).[9]

[9] Contagion represents a significant risk to the financial stability of banking systems and equity markets worldwide. Traditional macro-economic theory can rationalize cross-border co-movement between economically-linked countries, i.e. trade partners, however the bulk of observed co-movement had been concentrated during periods of crises, between economically developing markets that are relatively weakly economically linked. Overall, empirical observation has found the pattern of contagion to be uneven across both time and countries, and somewhat unexplained by traditional macro theories. For instance, even accounting for the release of economic news and other information (assuming co-movement is financial markets responding to the same public news events), much of the increased volatility and co-movement remains unexplained (Kaminsky and Schmukler, 1999; Connolly and Wang, 2000). In response, a literature was born with the objective of explaining the observed co-movement and excess volatility that accompanies extreme negative return periods.

This study focuses on the non-fundamentals-based view of contagion.[10] Under this view, co-movements are associated with investor or other agents' global trading behavior in response to local shocks, such as financial panic, loss of confidence, and incorrect cross-country inferences due to imperfect information (Kodres and Pritsker [2002]). For instance, adverse market conditions (e.g. panic, loss of confidence, funding liquidity shock) prompting sales in an afflicted country may lead investors to liquidate investments in healthy markets to cover their losses or recalibrate their portfolios. Along these lines, I view contagion as negative events in a foreign country, outside of local economic fundamentals, that spread and have deleterious effects on home markets, via investor trading (Forbes [2012]).

Prior literature documents that market integration plays a key role in the propagation of contagion among equity markets. Bekaert et al. [2005] show that more integrated markets, i.e. those with greater level of foreign investment and great number of trade and financial linkages, experience greater correlation in returns during crises periods. Forbes [2012] examines contagion over time, and finds that that the incidence of contagion (i.e., negative return coincidence) doubled from 1981 through 2009. Generally, these studies employ probability analysis (i.e. logit and quantile regression) in conjunction with multivariate extreme value theory to test whether tail observations in returns are correlated across countries. Taken together, this literature concludes that as

[10] The *fundamentals-based* reasons seek to explain contagion through emphasizing co-movements in stock prices that result from the macroeconomic interdependence due to real economic linkages, e.g. international trade partnerships. I control for these factors in my analyses.

markets become more integrated, countries are more likely to experience negative returns simultaneously.

Traditionally, two prevailing channels have been put forward to explain the spread of contagion, (1) correlated information channel; and (2) the liquidity shock channel. Beginning with the correlated information channel, it has been shown that in a world with imperfect public information (not unlike the current reality), a real shock in country *i* that would have otherwise have no effect on country *j* can have a significant effect on *j*'s financial markets (Pritsker [2001]). That is, a negative shock in country *i* will lower prices in *i*'s financial markets, but investors in country *j* will not be able to discern whether price decline in market *i* reflects information that is relevant for market *j*, but because of the possibility that it is relevant, a price decline in market *i* will cause a price decline in market *j*. Thus under correlated information transmission, contagion spreads as price changes in one market have perceived implications for the values in other markets (Longstaff [2010]), investors trading induces co-movement in prices regardless of whether the extrapolated news is relevant or not.[11]

The other potential channel for the propagation of return contagion is the spread of foreign liquidity shocks. It is this channel that will be the primary focus of the paper. When investors in one market suffer a localized liquidity shock, to obtain liquidity, they will sell or rebalance their assets in a number of other markets; putting

[11] It is important to note that the notion of correlated information here refers to the extrapolation of information regarding one market or firm to another. There doesn't necessarily have to be an economic justification for this extrapolation, only that investors perceive this to be the case. This can also manifest itself as enthusiasm or weariness about certain stocks and markets that is transmitted to other firms or markets through investor trading behaviors.

pressure on foreign market prices (unrelated to their fundamentals) leading to depressed prices and liquidity crunches (e.g., Allen and Gale [2000], Kodres and Pritsker [2002]).[12] Analytically, Kyle and Xiong [2001] and Yuan [2005] show that wealth-constrained investors who lose money may need to liquidate positions in multiple countries, thereby spreading a liquidity crunch from one country to others. Providing empirical evidence, Bekaert et al. [2007] show that innovations in *local* market liquidity are a significant driver of expected returns and liquidity levels in *foreign* markets, especially in markets where foreign investment is high. More directly, Jotikasthira, Lundblad, and Ramadorai [2009] find evidence that investment funds respond to outflows, (e.g., following a shock to their investor base) by changing their portfolio allocation across markets which significantly impacts market equity returns and increases market co-movement.

Interestingly, these two channels are not mutually exclusive. Kodres & Pritsker [2002] propose a model that folds in these two established channels, but also seeks to explain some of the empirical inconsistencies, i.e. the fact that contagion is more prevalent in emerging countries. They call this new channel, cross-market re-balancing. As with traditional liquidity shock models, investors respond to shocks in one market by optimally readjusting their portfolios in other markets, thus transmitting shocks, and

[12] In addition, Allen and Gale [2000], and Brunnermeier and Pederson [2009] show that even isolated localized liquidity shocks can spread entirely throughout the whole market, as overall market liquidity dries up and other asset prices fall reflecting investors' "flight to quality", thus impacting global investors throughout the economy. These studies demonstrate that investors will respond to an exogenous liquidity shock in one market, by selling off assets they hold in other market, and that even a small liquidity preference shock in one region can spread by contagion throughout other regions.

generally contagion. However, the key insight of their model is that when portfolio rebalancing occurs in markets with information asymmetries, the resulting price movements are exaggerated because the order flow is misconstrued as being information based.

Overall, both empirical and analytical evidence alike suggests that market integration increases the spread of localized shocks throughout other countries and facilitates cross-border contagion. The propagation of shocks is positively associated with the extent of foreign equity investment within a market. Therefore, increasing the percentage of foreign investors within a firm's investor base will necessarily make the stock more susceptible to foreign risks (e.g. liquidity shocks) and allow these foreign idiosyncratic risks to transmit into the local stock price via trading.

*2.3 IFRS and Cross-border contagion*

Given the discussion above, accounting harmonization may exacerbate cross-border contagion as the widespread adoption IFRS has been shown to reduce the barriers to cross-border investment and promote significant foreign equity investment within IFRS adopting jurisdictions. The increased globalization of investor bases promoted by IFRS adoption makes local markets more susceptible to foreign risks through foreign investor trading in response to their domestic adverse market shocks. In addition to the direct transmission of contagion due to foreign investor trading behavior, the harmonization of accounting may facilitate subjective comparability across

national borders between firms and markets. For instance, adverse conditions may lead to financial panic in one country may change investors' beliefs about the financial health of another country, causing other investors to withdraw capital for fear of further market pressures. In the presence of imperfect information, investors may overweight the extent to which they can extrapolate information signals across countries, resulting in incorrect cross-inferences (Pasquariello [2007]), and contagion ensues.

Accordingly, my main prediction is that cross-border contagion will be exacerbated when accounting standards are harmonized representing a significant cost to local markets and firms. Moreover, I predict this relation should be stronger in countries where IFRS had the greatest impact of the integration of equity markets, i.e. greatest increase in foreign investment following IFRS adoption, which I term the *integration effect*.

### *2.3.1 Reporting transparency and cross-border contagion*

The IASB states that IFRS adoption increases transparency (EC Regulation No. 1606/2002; McCreevy [2005]), as IFRS is more market-oriented and requires more comprehensive disclosures than prior GAAP. To the extent that greater reporting transparency reduces the uncertainty of a firm's true economic value, the widespread adoption of IFRS may actually reduce propagation of cross-border contagion. The rationale can be seen more clearly through the liquidity shock channel, as follows: investors prefer stocks that are liquid. Transparency has the potential to improve

liquidity by reducing private information concerns between investors; concerns that are more pronounced during market downturns, precisely when the lack of liquidity is of most consequence. Analytically, Brunnermeier and Pederson [2009], and Vayanos [2004], shows that when investors are hit with localized liquidity shocks, they will tend to liquidate and sell asset positions that they are most uncertain about ("*flight to quality*"). Therefore, to the extent that greater financial reporting transparency reduces the uncertainty of investors, then it has the potential to reduce the transmission of liquidity shocks for stocks with greater transparency. Empirical studies generally provide support for the link between financial reporting transparency and liquidity.[13]

I test whether the transparency effect associated with IFRS mitigates the increased risk of foreign shocks that manifest through the integration effect. I predict that countries that experienced the greatest increase in reporting quality post-IFRS adoption will be most shielded from the increased risk of foreign liquidity shock transmission, and incorrect cross-inferences from cross-border extrapolation.

[13] A number of empirical studies provide support for a link between financial reporting transparency and liquidity, specifically in the context of IFRS adoption, Lang and Maffett [2011] employ IFRS as a measure of transparency and find it is associated with lower illiquidity, relative to previous GAAP, suggesting financial reporting transparency can shield firms from local adverse liquidity shocks. However, Platikanova and Perramon [2009] find significant variation in the strength of correlation between changes in liquidity and information asymmetry measures across several E.U. countries following IFRS adoption.

## Chapter 3

## Research Design

The objective of this study is to provide evidence that accounting harmonization is associated with cross-border contagion. Towards this end, I examine whether the extent to which local markets move more closely with foreign markets during times of significant market downturns is exacerbated when both countries follow the same accounting standards. Specifically, my main analysis is concerned with testing whether cross-border contagion is more pronounced among IFRS adopting countries, relative to non-adopters. I focus on two interrelated measures commonly used to capture cross-border contagion: worst return contagion and the variability of market liquidity. All tests employ a country-level pairwise sample and are in the spirit of a difference-in-differences design, exploiting variation in the adoption dates of countries. I include interaction terms to capture the average pair-wise correlations in returns and liquidity measures of IFRS adopting countries, relative to pair-wise correlation between non-adopting countries. In addition, my return tests employ well established methods of measuring contagion by utilizing an

extreme value probability approach (see Forbes [2012] for an excellent review of estimation methods).[14]

My identification strategy comprises a number of dimensions. First, I identify my underlying mechanism, i.e. mixing of investor bases, by examining the clustering of returns in only the bottom decile of market-level return distributions. This proxy for adverse market shocks ensures that, assuming investors are now more globalized, they will have to re-balance and sell off stocks in order to cover their loses – mechanically transmitting the adverse shock to other markets in which they hold positions. Additionally, I also attempt to measure the extent of IFRS-induced foreign investment within local markets through my cross-sectional analysis (see section 3.3). Second, all analysis is performed using filtered returns in order to ensure my incidences of clustering and co-movement amongst pairs of countries are not simply due to common exposure to global factors, i.e. I attempt to isolate the idiosyncratic country-level return. Third, I look at clustering and co-movement of current local market conditions to lagged foreign market conditions. This provides comfort that local markets were impacted by shocks originating in foreign markets and avoids the potential simultaneity concern with looking at contemporaneous correlations. Finally, in order to isolate whether accounting harmonization exacerbates observed cross-border contagion I exploit variation in country-level adoption dates (and non-adopters) via my inclusion of an interaction that estimates

[14] Forbes (2012: 10) notes that "extreme-value analysis is emerging as potentially the cleanest approach to measuring the most common definition of contagion—any transmission of extreme negative shocks."

the incremental effect when both local and foreign markets follow IFRS. I explain my research design in greater detail below.

*3.1 Cross-border worst return contagion*

Bekaert et al. [2005], among others, define contagion as the correlation in returns above and beyond economic fundamentals such as exposure to common global risk factors. It is this notion that I intend to capture in the current study. To control for the potential effects of common exposure to fundamentals in driving my contagion correlation, I filter my constructed country index returns for common exposures. Effectively, the filtering process defines deviations from the expected correlation in returns based on economic fundamentals. Consistent with prior research, I regress the returns of each country, *j*, individually, on a number of variables, using the following specification:

$$R_{jt} = a_0 + \beta_1 P_{BCO_t} + \beta_2 \Delta_{BCO_t} + \beta_3 MSCI_t + \beta_4 vol_{MSCI_t} + \beta_5 LIBOR_t + \beta_6 TBill_{3M_t} + \epsilon_{jt} \quad (1)$$

Where,

$P\_BCO_t$ = Price of crude oil (Brent) at the end of week t;

$\Delta\_BCO_t$ = Change in price of crude oil (Brent) in week t;

$MSCI_t$ = Weekly return on the MSCI world index portfolio (including US);

$vol\_MSCI_t$ = Weekly volatility in the MSCI world index, measured as the standard deviation of daily returns during week t;

$LIBOR_t$ = Weekly change in 3-month LIBOR for week t; and

$TBILL^{3mth}$ = Weekly change in 3-month Treasury Bill rates for week t.

I define the residual from the above regression as the return for country j over week t, over and above common exposures. Accordingly, any observed clustering in the filtered return should represent contagion – i.e. contagion above correlation expected by fundamentals. The decision to use a weekly return window for this study was a trade-off between: (1) having a long enough window to mitigate measurement issues relating to the thinness of trading in some of the smaller international firms; (2) a fine enough window to capture investor trading in response to foreign shocks. Based on this, daily posed significant measurement issues and monthly windows appeared too noisy.

I include the weekly MSCI return index inclusive of the U.S. in the filtering process given the propensity for international markets to move with the U.S. For instance, Rapach, Strauss, and Zhou [2013] show that lagged U.S. returns predict returns for a number of foreign markets, especially non-industrial economies.[15]

To capture cross-border contagion in returns, I utilize an extreme value approach that tests whether left tail observations in filtered return distributions are correlated across countries (see Forbes [2012]). Consistent with prior literature, I define left tail observations as filtered returns in the bottom decile of a country's time-series distribution over the entire sample period—known as "worst returns". I use a logit model to address the issue of contagion by estimating whether a given country is more likely to have a worst return during a given week, conditional on other countries having also experienced

[15] In robustness testing, I also include the U.S. weekly as a separate variable.

a worst return in the previous week.[16] The dependent variable (*Loc_Worst_Ret*) is an indicator variable set to one if the local country index, *D*, under study has a (filtered) weekly return in the bottom decile of all weekly returns for that country and zero otherwise. To measure the extent of clustering in worst returns, I include a variable *For_Worst_Ret* which is an indicator variable set to one if the matched foreign country, *f*, is experiencing a worst return in the prior week, *t-1*. To capture the role of accounting harmonization in worst-return contagion, I include an indicator variable, *Both_IFRS,* that is set to one if both the domestic and matched foreign country follow IFRS, and the interaction between them. Importantly, I control for changes in bilateral trade between the domestic and foreign country *(Export)*, measured as the percentage change in exports of domestic country to the foreign match. This is a necessary control as Chen and Zhang [1997] find that cross-market correlations of stock returns are related to external trade among countries. In order to control for country-level differences in capital market enforcement which may be related to cross-border investment patterns, I include a country-level enforcement variable *(Enf)* from Leuz [2010]. Country-pair, and year, fixed effects (FE) are included to capture any unobserved country-pair economic relations or macro level shocks. Given each observation of the dependent variable is matched to multiple realizations of the independent variable i.e., each weekly local-market observation is matched to all other foreign market observations for a given week, I use robust standard errors clustered at the country-week level. This allows for correlation

[16] Logit models have been used extensively in the contagion literature (see, for instance, Eichengreen et al. [1996], and Bae et al. [2003]).

within standard errors of all country-pairs for a given local market in a given week, a much larger dimension than simply within country-pairs. This leads to the following specification

Leading to the following specification:

$$Loc\_Worst\_Ret_{D,t} = \varphi_1 + \varphi_2 Export_{f,t} + \varphi_3 Enf_{D,t} + \gamma_1 For\_Worst\_Ret_{f,t-1} + \gamma_2 Both\_IFRS_{f,D,t} + \gamma_2 Both\_IFRS_{f,D,t} + \gamma_3 (For\_Worst\_Ret_{f,t-1} * Both\_IFRS) + FE + \epsilon_{D,t} \quad (2)$$

I expect to observe $\gamma_3 > 0$, indicating significant clustering in worst-returns among countries that follow IFRS, relative to the clustering among those that do not. I don't have a clear prediction on $\gamma_2$ given it is conditional on the matched foreign country also following IFRS, thus one cannot simply interpret this as the impact of IFRS adoption on the likelihood of a local market experiencing a worst return. In addition, I expect the coefficient on $\gamma_1$ to be positive and significant, given prior literature in finance has established the existence of contagion in returns across markets. However, as the focus of this study is on the incremental impact of IFRS adoption on contagion, the interaction term is of most importance in confirming my predictions.

To make inferences regarding the nature of the documented cross-border contagion I re-estimate the above replacing worst return measure with an analogous "best return" measure, simply defined as weekly return in the top decile of a given country's weekly return distribution and compare the evidence of clustering in worst returns to that observed in best returns. Consistent with my arguments and characterization of contagion, I expect clustering among extreme negative returns to outweigh that observed in extreme positive returns. This asymmetry confirms that my results are capturing

contagion and not simply interdependence amongst markets that is present across the entire distribution of returns; a common concern in the contagion literature (see Claessens and Forbes [2003]).

*3.2 Liquidity contagion*

This sub-section describes my research design with respect to capturing liquidity contagion. As a first step, I need to establish that local market liquidity responds to changes in foreign market liquidity. This is necessary because my later tests capture the relation between the *variability* of market liquidity, so it is important to establish the sign of the co-movement that underpins this variability—a positive relation would be consistent with my interpretation of liquidity contagion as risk for local capital markets. To do so, I estimate the following model (3) to examine the association between local market liquidity and foreign market liquidity for IFRS and non-IFRS jurisdictions:

$$\%\Delta WPI_{m,t} = a_1 + \varphi_1 \%\Delta WPI_{f,t} + \varphi_2 Both\_IFRS_{f,i,t} + \varphi_3 (\%\Delta WPI_{f,t} * Both\_IFRS_{f,i,t}) + \epsilon_{i,t} \quad (3)$$

where, the prefix "%Δ" denotes the percentage change in the variables, defined as follows:

$WPI_{m,t}$ = Average of $WPI_{i,t}$ across all firms in market $m$ for week $t$, where $WPI_{i,t}$ is defined as the average daily price impact (DPI) for firm $i$ in week $t$. (DPI is defined in detail below);

$WPI_{f,t}$ = Average daily price impact, as defined above, for foreign market $f$ in week $t$;

$Both\_IFRS_{f,i,t}$ = Indicator set to 1 if firm $i$ corresponding foreign market $f$ report under IFRS, else set to 0.

I expect $\varphi_3 > 0$, indicating that the weekly percentage change in local market level liquidity is positively associated with weekly percentage changes in foreign market level liquidity, when both countries have adopted IFRS. In addition, I expect that $\varphi_1 > 0$, in line with analytical results from Brunnermeier and Pederson [2009]. While I have no formal prediction on the coefficient, $\varphi_2$, an insignificant finding would strengthen my evidence indicating no relation between domestic market liquidity and foreign market changes in liquidity when these countries follow different standards.

After establishing a positive relation between local and foreign market liquidity changes, I turn to the measurement of the spread of liquidity shocks. Consistent with prior research, I use liquidity volatility (*Liqvol*) to capture the extent to which a market has experienced a shock to liquidity.[17] My choice of liquidity volatility, rather than the level of liquidity, as the variable of interest is based on the following reasoning. First, given the objective of this study is to show that IFRS imposes unintended costs on capital markets, there is a growing consensus that investors price the variability of liquidity, rather than the level.[18] For instance Persaud [2003] notes, "there is a broad belief among users of financial liquidity~ traders, investors and central bankers—that the principal challenge is not the average level of financial liquidity, but its variability and uncertainty". Moreover,

[17] An empirical by-product of an extreme illiquidity event is an increase in the variability of the illiquidity variable over the period.

[18] The premise of this argument is that investors prefer firms with relatively predictable liquidity because it allows them to more accurately anticipate the trading costs with closing out a position, at the time of initial purchase. To the extent a stock's liquidity is highly variable, it increases the uncertainty attached to a position and limits a potential investor's flexibility (Lang and Maffett [2011]).

Lou and Sadka [2010] show that during a crisis period, liquidity variability is more appropriate for predicting stock return performance than is the level of liquidity.

Liquidity volatility is measured as the natural log of weekly standard deviation of the daily Amihud's [2002] price impact of trade measure (DPI). The DPI measure captures the ability of investors to trade in a stock without affecting its price. One can think of it as an estimate of the potential price impact associated with transacting one thousand dollars worth of stock in a given day. Following prior literature, I calculate DPI as:

$$\frac{|R_{i,d}|}{P_{i,d}VOL_{i,d}}$$

where, $R_{i,d}$ is the daily percentage price change, $P_{i,d}$ is the price in $U.S., and $VOL_{i,d}$ is the trading volume in thousands, for stock *i* on day *d*. Higher values of DPI indicate greater illiquidity, i.e. greater price impact from trading. I exclude zero return days from the calculation to avoid misclassifying days with no trading activity (Daske et al. [2008]), and require a minimum of 3 daily DPI observations for a valid firm-week *Liqvol*. This measure captures extreme changes to weekly liquidity, therefore examining the correlation between domestic *Liqvol* and lagged foreign market *Liqvol* will provide insight into the transmission of liquidity shocks across national borders.

To formally test my predictions, I employ a difference-in-differences type design, exploiting the variation in country level adoption dates, and pair-wise matches, by augmenting traditional liquidity volatility determinant models used in the literature (e.g. Stoll [2000]) with variables measuring lagged foreign market liquidity volatility

(*For_Mkt_LiqVol*), an indicator capturing whether both the domestic and matched foreign market follow IFRS (*Both_IFRS*) and the interaction between them. I also include country-pair and year fixed effects (*FE*), as follows:

$$Dom\_Mkt\_Liqvol_{m,t} = a_1 + \varphi_1 EXP_{m,t} + \varphi_2 RET_{m,t} + \varphi_3 Illiq_{m,t} + \varphi_4 Enf_{m,t} + \gamma_1 Both\_IFRS_{f,m,t} \quad (4)$$
$$+\gamma_2 For\_Mkt\_Liq_{f,t} + \gamma_3 (For\_Mkt\_Liq_{f,t} * Both\_IFRS_{f,m,t}) + FE + \epsilon_{m,t}$$

Where, domestic market liquidity volatility (*Dom_Mkt_Liq*) is computed as the equal weighted weekly average of all firms' *Liqvol* within in a given country. This country-level liquidity volatility is then matched to lagged foreign market liquidity volatility of all other foreign markets. As an example, German market liquidity volatility over week *t* is matched to liquidity volatility for all other 34 countries over week *t-1*. This yields a sample of domestic-market-to-foreign-market weekly pairs which constitutes the unit of observation for my analysis. I also include country pair fixed effects to control for any unobservable bilateral economic relations between countries. All other control variables are defined as above.

This design allows me to examine whether variability in local market liquidity is explained by liquidity shocks originating in foreign markets. More importantly, I test for a differential effect between IFRS adopting country pairs and non-IFRS adopting country pairs in order to isolate the role of accounting harmonization in the transmission of liquidity shocks. Note that I control for the level of domestic market returns (*Ret*) and fundamental economic linkages between domestic and foreign market, captured by the

annual level of exports (in $U.S.) from domestic market $m$ to foreign market $f$.[19] I expect the coefficient on the interaction term $\gamma_3$, to be significantly positive, indicating that domestic liquidity volatility is exacerbated by shocks to foreign market liquidity volatility when both countries follow IFRS.

*3.3 Cross-sectional analysis: Integration effect*

I then turn my attention to cross-sectional analysis among IFRS-adopters. In order to provide comfort that my observed clustering in worst returns, and increased correlation of liquidity volatility, among IFRS adopting markets is attributable to an IFRS integration effect, I partition the sample based on the changes in foreign portfolio equity investment (FPI) immediately following the adoption of IFRS. The rationale being that if increased foreign investment promoted by IFRS adoption is the catalyst for increased foreign liquidity shocks as I argue, we should see countries with the most IFRS-induced foreign investment are most susceptible to liquidity shocks.

Empirically, I measure market integration as the change in FPI around the time of IFRS adoption. To do so, I obtain annual country level data (in $USD) from 2001 through 2010 on the foreign portfolio holdings of 73 countries from the Coordinated Portfolio Investment Survey (CPIS) of the International Monetary Fund (IMF).[20] The Coordinated Portfolio Investment Survey (CPIS) is an annual voluntary portfolio

[19] Bilateral trade data is sourced from the U.N. data statistics website.which can be found at (http://comtrade.un.org/db/dqBasicQuery.aspx).

[20] The CPIS reports bilateral data on foreign equity portfolio asset holdings by the residence of the issuer. For each of the 73 source countries, the survey reports holdings in approximately 240 destination countries or territories.
Data are available at http://www.imf.org/external/np/sta/pi/cpis.htm.

investment data collection exercise conducted under the auspices of the IMF. To participate, an economy must provide data on its year-end holdings of securities (data are separately requested for equity, long-term debt instruments, and short-term debt instruments). All economies are encouraged to participate. I compute the yearly percentage change in FPI inflows for a country, excluding investment by the US, scaled by opening total equity market equity capitalization. I partition countries into High and Low sub-samples, splitting at the median change in FPI immediately following the adoption of IFRS. I then re-estimate equations (2) and (4) within high and low sub-samples, expecting that those countries with greatest inflow of FPI post IFRS, should have greatest risk of cross-border contagion.

*3.4 Cross-sectional analysis: Transparency effect*

Working against the potential increase in contagion from this integration effect, IFRS may be viewed as more than a simple homogenous tool of integration. Prior literature has shown IFRS to be more transparent than prior GAAP. Given increased transparency may shield firms from local liquidity shocks (e.g. Lang and Maffett [2011]; Brunnermeier and Pederson [2009]), I empirically test whether transparency can attenuate this new foreign source of risk. I measure the change in reporting quality as a result of IFRS adoption in two ways. First, drawing on arguments in the prior literature that find countries with the largest differences between local GAAP and IFRS tend to exhibit the greatest increase in accounting quality, I employ a measure of "Accounting distance" from Yu [2011] and Bae et al. [2008]. This measure captures the extent to which local

GAAP differed from IFRS along the dimensions of 21 key accounting standards (see Yu [2011] for in-depth discussion on the accounting distance variable). Differences are constructed based on a survey of seven global accounting firms (Nobes [2008]) who presented a detailed comparison of different accounting rules in each country and classifies them to be the same or different from IFRS. Greater accounting distance therefore signifies a greater increase in reporting quality attributable to the IFRS mandate.

My second measure of IFRS reporting quality is more direct, and adapted from Leuz et al. [2003]. It is an aggregate measure of accounting quality that captures the variability of accruals, the ability of accruals to map into cash flows, and the incidence of small losses. These measures are first computed at the firm level, then, to convert these measures to a single country metric, I take the median value of each measure across all firms within a country, and take the average rank of these values across all four measures for each country. I compute these measures using post-IFRS accounting numbers, and then compare my computed values to the country-level values reported in Leuz et al. [2003], i.e., pre-IFRS country-level values. I then take the difference in these two values as my country-level measure of "IFRS reporting quality".

Using both measures of post-IFRS accounting quality, I partition the sample based into high and low countries and then re-estimate equations (2) and (4). Note that, in these regressions, I also include a specification where I control for IFRS-induced FPI investment (i.e. partitioning variable from integration tests). Consistent with theory, I

expect the strength of the return and liquidity contagion relation to be attenuated for firms residing in the high transparency sub-sample of countries.

## Chapter 4

## Data

This study utilizes data from a number of sources. First, I collect firm-level market data for all available countries from Datastream, including all 17 Eurozone countries, from 2000 through 2010. [21] Specifically, I obtain daily returns, daily prices, weekly market value of equity, annual financial statement data including reporting GAAP, and relevant firm-specific information such as SEDOL, firm name and description, industry, major exchange listing, country of listing/incorporation, equity status, equity type, listing currency and reporting currency from Datastream. I obtain daily volume, daily exchange rates and annual fiscal period end dates Bloomberg. As a supplementary source for daily volume data, I use Datastream when Bloomberg daily volume is missing. Data on bilateral Foreign Portfolio Investment (FPI) is sourced from the IMF data website, and bilateral trade data on exports from the UN data statistics website. Data on ADR programs is obtained from the Bank of New York, and data on country specific DR

[21] Eurozone, officially known as the "Euro area", is an economic and monetary alliance between 17 European Union member states. These countries include: Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, the Netherlands, Portugal, Slovakia, Slovenia, and Spain.

programs is obtained as part of my country level non-common equity filters from Datastream.

Beginning with a full Datastream sample of 36,492 securities located across 48 markets, I remove securities without valid SEDOLs, duplicates, non-equity issuances, exchange traded funds and funds, investment vehicles, real estate funds, preference share, warrants and debt issuances, along with the identifiable non-primary listings, with the goal to preserve a sample of traded common equity stocks.[22] Table 1, Panel A details these procedures, which results in 29,727 (or 16,804,038 firm-weeks) securities with return data relevant to our sample period, 2001-2010.

Given the importance of return and liquidity measures, I run return filters as per Griffin et al. [2008] in order to mitigate the potential for data errors.[23] Following, 5,574 firms (6,877,697 firm-weeks) are removed due to insufficient data with respect to my contagion measures. Further, I remove 3,984 firms (3,386,352 firm-weeks) with missing data on the specific accounting standards followed; 1,469 firms (726,828 firm-weeks) due to missing data regarding control variables and ADR/GDR firms; 4,008 firms (2,441,788 firm-weeks) due to insufficient time-series of data pre- and post-IFRS adoption; and 1,880 firms (678,443 firm-weeks) with opening market capitalization less than $50M USD. This leaves a final sample of 2,692,930 firm-week observations (13,494 firms), over the

[22] In order to ensure I keep valid common equity stocks, I run name filters as per Griffin et al. [2009]. Given Datastream details security information within a firm's name, such as delisting date, share status/type etc., I perform automated and manual checking procedures to ensure only valid omissions.

[23] For daily returns, if $r_t$ or $r_{t-1} > 100$ percent and $(1+ r_{t-1})*(1+ r_t)-1<20$ percent, then both $r_t$ and $r_{t-1}$ are set equal to a missing value. Additionally, any daily return greater than 200 percent is set to missing. For weekly returns, if $r_t$ or $r_{t-1} > 300$ percent and $(1+ r_{t-1})*(1+ r_t)-1 < 50$ percent, then both $r_t$ and $r_{t-1}$ are set equal to a missing value, and any weekly return greater than 500 percent is set to missing.

period 2001-2010 consisting of local stocks traded by local investors, across 35 countries. Table 1, Panel B outlines the above procedures. I then compute my country-level return indexes and liquidity volatility measure as the equal weighted average of all firms within a given country. It is important to note that my country-level returns are computed using only locally traded equities, in order to reduce the confounding effect of cross-listed firms on my results. Each country-week is then matched to all other country-weeks (with a lag), for a given week. This yields a final pairwise sample of 559,936 country-week observations and forms the sample utilized for my difference-in-difference analysis.

One of the primary variables of interest in this study is the date at which a firm (and country) adopted IFRS. This data is collected from two primary sources. First, for country-level adoption dates, data is gathered from Deloitte's IASPlus website, which has been used extensively in prior literature and is a source of information for the IASB. Of the 174 jurisdictions with available information on IASPlus, 93 require the use of IFRS for all listed companies, with another 25 permitting its use, as of January 2012. In the few instances where countries have staggered adoption timelines I use the earliest date at which a significant number of firms were required to use IFRS, otherwise I use the earliest fiscal-year end date following IFRS adoption.[24] Many jurisdictions that maintain their own local GAAP claim that their local GAAP is "based on" or "similar to" or "converged with" IFRSs. Often, not all IASs/IFRSs have been adopted locally—there is a

[24] For instance, Chile adopted IFRS over three years. Major open corporations, i.e. greater than 500 shareholders were required to prepare IFRS-compliant financial statements from 1 January 2009 (31 December 2009 year-ends), while small open corporations, i.e. less than 500 shareholders didn't have to prepare IFRS-compliant financial statements until 1 January 2010 (31 December 2010 year-ends).

time lag in adopting an IFRS is local GAAP. Note that IASPlus do not compare national or regional GAAPs to IFRSs in detail; they report only direct use of IFRSs in individual countries or regions. Direct use means that the basis of preparation note and the auditor's report will refer to conformity with IFRSs. For additional information, I also use adoptIFRS.org, which outlines key dates of countries' IFRS adoption procedures. In order to ensure I'm capturing the appropriate date of convergence for my constructed country indexes, I also hand collect data on individual firm adoption dates and ensure country-level dates line up with at least 70 percent of firms in each country.

Data on the IFRS adoption dates of individual firms are collected from Worldscope. I begin with information from the "Accounting Standards Followed" field in Worldscope as it offers the largest sample. I identify IFRS-firm years if Worldscope indicates that financials are based on "International Standards", "IFRS", or "IASC". I then verify, manually, the coding of a random sample of IFRS adopting firm year observations, where possible. Towards this end, I download electronic copies of annual reports from Thomson Research, and company websites (where identifiable), search and read the relevant parts of the annual report (footnote and/or auditors report). In total, I verified approximately 1,200 IFRS-year adoptions from 24 IFRS-adopting countries.

Table 2 presents the breakdown of sample coverage within each country. Overall, my sample covers 74 percent of total market capitalization over the period. It is noted that while a large number of countries adopted IFRS from fiscal period ending 31 December 2005, i.e. E.U. member states, there still exists adequate variation in adoption

dates (and non-adoption) among my sample of countries (see Table 2 for country level adoption dates).

Table 3 presents descriptive statistics. Panel A shows the descriptive statistics for all variables for the full sample of 559,936 unique country-weeks. Panel B shows the mean values of my liquidity measures on a country-by-country basis. The average weekly liquidity volatility is 0.488 with average weekly return of 0.017. From Panel B, we see that there exists significant variation in liquidity volatility across countries, with Indonesia having the largest liquidity volatility of 1.132. It is also notable that liquidity volatility is, on average, larger for IFRS adopting jurisdictions, following the adoption of IFRS.

In cross-sectional tests I employ measures of cross-border equity investment by using the Foreign Portfolio Investment (FPI) data maintained by the International Monetary Fund (IMF). The data is found on the Coordinated Portfolio Investment Survey (CPIS) website.[25] The data is reported in millions of U.S. dollars. The CPIS data shows bilateral trade flow data, in matrix form, from the individual economy tables of residents' holdings of securities issued by nonresidents (reported data) and the derived data for nonresidents' holdings of securities issued by residents (derived data). The geographic breakdown of the reported data is limited to the CPIS participating economies, while the geographic breakdown of the derived data covers all economies that issue securities that are held by CPIS participating economies. The data used in this study

[25] CPIS data can be found at: http://www.imf.org/wxternal/np/sta/pi/cpis.htm

is based on information provided by economies that participated in the 2010 and 2011 CPIS Metadata Survey.

## Chapter 5

## Empirical Results

*5.1 Discussion of main results*

Table 4 shows the results from my worst return contagion analysis. Consistent with my first prediction, I find a positive and significant coefficient on the interaction term, $\gamma_3$= 0.402 (p<0.01). This suggest that IFRS adopting jurisdictions exhibit an average of 45 percent more clustering of worst returns, relative to non-adopting countries, indicating that IFRS adopting countries are now significantly more likely to experience negative price movements due to cross-border contagion. Moreover, the clustering is much weaker – almost four times smaller – in upside returns (i.e. returns in the top 10% of their return distributions). This asymmetry in the observed clustering of different tail returns suggests that my results are not simply documenting increased interdependence, i.e. co-movement in any state of the world. With respect to my control variables, *Export* is significantly positive,, consistent with expectations, while *Enf* is negative but only marginally significant.

I perform the following sensitivity testing to ensure the robustness of my result:

(1) I repeat this analysis choosing different extreme value thresholds for which to examine the probability of clustering—instead of the 10$^{th}$ percentile, I re-define worst returns as those in the bottom 5$^{th}$ percentile, and those in the bottom

20th percentile (un-tabulated). As expected, I find that the observed clustering is more pronounced ($\gamma_3$= 0.523, p<0.05) when using more extreme realizations (5th percentile), and significantly attenuated ($\gamma_3$= 0.212, p<0.01) when using less extreme realizations (20th percentile). This provides further comfort that my main result is evidence of downside contagion, and not simply interdependence or common exposure to fundamentals.

(2) I repeat the main analysis by assigning worst return weeks on a yearly basis, this ensures that worst return observations are not clustered in post-IFRS period given the recent financial crisis of 2008/2009. Effectively, I enforce the same number of worst return observations to occur each year, to ensure power in both the pre- and post-IFRS period. I note that results are attenuated in magnitude ($\gamma_3$= 0.328, p<0.05) but not significantly different from those reported.

(3) I also perform the analysis at the firm level, where an additional control was added for whether the domestic market return was a worst return. The tenor of the results remains the same, in that I find evidence consistent with return contagion impacting individual firms, above and beyond local market wide movements ($\gamma_3$= 0.383, p<0.01). While the focus of the paper is at the market level, the firm level results provide further comfort given the increased variation in adoption dates, and additional variation able to be exploited as several firms within IFRS adopting countries adopted at different times.

With respect to my liquidity contagion analysis, I first establish that domestic market liquidity movements are related to foreign market-level liquidity changes, and that these changes are more pronounced amongst IFRS adopting jurisdictions. Table 5 presents the results of estimating equation (3). I find a positive and significant coefficient on the interaction term, $\varphi_3 = 0.056\ (p < 0.01)$, indicating an incrementally positive association between weekly percentage change in firm level liquidity and weekly percentage change in a foreign market level liquidity when both countries have adopted IFRS. While the coefficient on the main effect is still positive and significant, $\varphi_1 = 0.062$ $(p < 0.01)$, the relation between domestic market-level liquidity and foreign market changes in liquidity is significantly smaller unless both countries follow IFRS. This establishes a *positive* co-movement between local and domestic liquidity. In addition, the strength of this co-movement is almost double when both firms and markets report under IFRS. Prima-facie, these findings suggests accounting harmonization may play a role in the transmission of cross-border liquidity shocks, and that the co-movement in liquidity represents exposure to additional foreign risk.

I now turn my attention to a more in-depth analysis, employing control variables and my measures of liquidity shock transmission. When markets experience a liquidity shock it necessarily increases the variability of market level liquidity. To the extent that accounting harmonization exacerbates the propagation of liquidity shocks, we should see liquidity variability more correlated amongst IFRS adopting countries, relative to non-adopting countries. Table 6 presents the regression results for the domestic market and foreign market liquidity volatility analysis (i.e., liquidity contagion test). Consistent with

prior literature, control variables load significant with the predicted sign. In terms of my variables of interest, local liquidity volatility tends to increase in the week following an increase in foreign market volatility. However, this contagious effect is almost doubled amongst IFRS adopting jurisdictions ($\gamma_3 = 0.068, p < 0.05$). This suggests that liquidity volatility of local markets is much more impacted by foreign shocks occurring in foreign markets (captured via lagged foreign market liquidity volatility) when both markets follow IFRS. I take this as evidence of liquidity contagion amongst IFRS adopting markets.[27]

As further robustness, I also estimate the relation between local market liquidity volatility and foreign market liquidity by including all matched foreign markets as separate regressors and fully interacting them with *IFRS* variable. This effectively removes the issue of repeated independent variables. In addition, it allows insight into the importance of each foreign market on the impact of local liquidity volatility. In un-tabulated results I find that more than half IFRS adopting countries (14) were positive and significant, suggesting that my contagion results is pervasive in my sample and not driven by a few large countries.

Overall, the evidence suggests that foreign liquidity shocks—captured by the extent of variability in foreign market liquidity—appear to impact domestic market liquidity

[27] It is noted that the main effect on the pairwise IFRS indicator is negative and significant ($\gamma_2 = -0.037, p < 0.10$), broadly consistent with prior literature that suggests reporting transparency (IFRS has been argued to proxy for this) can reduce liquidity variability (e.g., Lang and Maffett [2011], Vayanos [2004]). However, I caution the reader from drawing any inferences from this particular coefficient, given the indicator variable, *IFRS*, is conditional on whether the matched foreign market is also following IFRS, it is not simply capturing the average impact of IFRS reporting on market volatility.

volatility. This impact almost twice as large amongst IFRS adopters, suggesting that accounting harmonization exacerbated the spread of contagion.

*5.2 Discussion of alternative explanations*

An alternative explanation for the above contagion results may be that IFRS adopters are just inherently more integrated in the first place, especially given that a large number of adopters are "Euro Area" countries that share a number of trade agreements and exposure to common to foreign exchange risks. However, given my design, the argument would have to be that these countries become more economically integrated around the time of IFRS adoption. A number of prior studies however show that the main push for economic integration within the E.U. happened around the time of the introduction of the Euro, in January 1999, and the formation of the "Euro Area" which ratified a number of economic and trade link agreements. For instance, Jayaraman and Verdi [2012] documented convergence in firms' fundamentals subsequent to the introduction of the Euro currency in 1999, rather than post IFRS-adoption in 2005. While Rajan and Zingales [2003] find that cross-border bond financing spikes substantially (i.e., by more than three times) immediately after the adoption of the Euro. In light of these findings, one may conclude that the main thrust of Euro linkages and integration occurred in the pre-IFRS period, several years before IFRS reporting. Notwithstanding, I control for the yearly bilateral exports between my country pairs in my market level analysis, in order to abstract away from significant real economic linkages, and provide comfort that the observed increase in contagion is due to investor responses

to IFRS. Moreover, I plot the average growth in exports (proxy for bilateral trade) for IFRS adopting and non-IFRS adopting countries from 2001-2010 in Figure 1A. This shows that significant trade growth occurred in the pre-IFRS period (i.e., pre 2005), and moreover we don't see significant spikes in trade growth among IFRS-adopter relative to non-adopting countries.

Additionally any investment behavior associated with E.U. integration rather than accounting harmonization likely happened in my pre-IFRS period. The move to a single currency within the E.U. has effectively removed currency risk among member countries, increasing the substitutability of domestic and foreign securities, and likely increasing bilateral foreign investment amongst member countries. Lane and Milesi-Ferrett [2008] find the most significant increase in intra-euro area holdings (as a share of world cross-border holdings occurred in the period 1999-2005, up from 13.5 percent to 17.75 percent, with the most pronounced increase in 2001.[28] Again, this increased investment and market integration with in E.U. members states occurred in the pre-IFRS period, and hence would actually bias against my result. It must be that another round of integration occurred around the time of IFRS adoption, which I argue is as a result of harmonized accounting standards.

To provide more direct evidence of this I plot the average yearly level of FPI inflows (scaled by opening total equity market capitalization) for IFRS adopting and non-IFRS

[28] The fraction of the domestic stock market held by non-resident portfolio investors was substantially higher in the euro area and the United Kingdom (over 33.3%) than in the United States and Japan (13 and 17 percent, respectively).

countries, see Figure 1B. From this, it is evident that FPI inflows spiked a little around 2001, for all countries, however we then see a significant spike in FPI inflows for IFRS-adopting countries around 2005 (i.e., the time of the mandate in the EU) relative to a more modest increase in non-IFRS adopting countries. I provide additional cross-sectional evidence to this end below, in Section 5.3.

As final robustness I re-perform my return and liquidity contagion analysis after removing the five countries identified in Christensen et al. (2012) as having significant concurrent changes in enforcement (i.e., Finland, Germany, the Netherlands, Norway, and the U.K). This provides comfort that the observed results are pervasive across all IFRS adopters, and attributable to the switch in accounting standards, not simply improvements in enforcement. I find that return and liquidity contagion results are slightly attenuated (return contagion coefficient, $\gamma_3$= 0.354, p<0.05; liquidity contagion coefficient, $\gamma_3 = 0.054, p < 0.05$), however not significantly different from those reported in Table 4 and Table 6; inferences remained unchanged.

*5.3. Cross-sectional analysis*

In order to provide comfort that the observed increase in the clustering of worst returns and the correlation of liquidity volatility between IFRS adopting markets is indicative of the integration effect of harmonization accounting standards, I test for plausible cross-sectional variation based on the extent of IFRS-induced foreign investment. It is well established that IFRS adoption promoted significant foreign equity

investment within IFRS adopting countries (Amiram [2012], Bruggemann et al. [2012], Covrig et al. [2007], DeFond et al. [2011], Yu [2011]). Increasing the percentage of foreign investors within a firm's and country's investor base will necessarily make the stock more susceptible to foreign liquidity shocks, via their trading. Therefore, I predict a positive association between IFRS-induced foreign investment and my measures of cross-border contagion.

In line with this, I partition my sample of IFRS adopters based on IFRS-induced investment— measured as the percentage increase in Foreign Portfolio Investment (FPI) in the two years immediately following country-level IFRS adoption. I argue that those countries that experienced the greatest increase in investment due to IFRS are more susceptible to cross-border contagion through foreign investor trading. Countries are classified as either High or Low based on whether they are above or below the sample median change in FPI. Those countries labeled as "high" foreign investment experienced FPI increases of 60 percent, on average, while countries labeled as "low" experienced an average increase in FPI of 20.4 percent.[29] This is in contrast with non-IFRS adopting countries experiencing an average increase in FPI of 16.8%, computed over the same

[29] Note that all countries saw increases in FPI following IFRS adoption, except New Zealand (decrease of 45%). Portugal experienced the largest increase in FPI post-IFRS adoption with an increase of 145%. Interestingly, we see the countries that struggled the most during the European crises: Greece, Italy, Ireland, and Portugal, all in the "high" IFRS-FPI change category. The full classification of countries is as follows: "high" FPI countries consist of: Australia, Austria, Belgium, France, Greece, Ireland, Italy, Norway, Portugal, Sweden, Singapore; and "Low" countries consist of: Chile, Czech Republic, Denmark, Finland, Germany, Hungary, Israel, Netherlands, New Zealand, South Africa, Spain, Switzerland, U.K.

period—prima facie an indication that IFRS adoption is associated with in an increase in FPI, consistent with the conclusions of Amiram [2012].

Table 7 provides results from re-estimating my logit analysis of return contagion (Pane A) and the liquidity volatility (Panel B) specifications across the sub-samples of High and Low FPI countries. Consistent with predictions, I find that return and liquidity contagion is significantly more pronounced for High FPI countries, relative to Low FPI countries. I find a positive and significant difference in the interaction term *For_Mkt_Worst*IFRS* (*For_Mkt_Liqvol*IFRS*) between High and Low FPI countries of 0.402 (0.052).[30]

Table 8 and 9 report the results of my analysis of the role of accounting transparency on cross-border contagion. As discussed in section 3, I measure the transparency of IFRS in two ways, (1) employing the country-level accounting distance measure ("IFRS reporting impact") in Yu [2011] and an IFRS earnings quality measure

[30] In order to assess the differential impact of impact of foreign investment inflows (FPI) and the orthogonal component of IFRS adoption on liquidity volatility, I perform the following test. Instead of pairwise design, I perform a simple OLS regression at the country-week level. Instead of a partitioning the sample, I simply include yearly changes in FPI, and an IFRS indicator that switches on when the country adopts IFRS. This will enable us to observe average impact on liquidity variability after controlling for FPI, i.e. can speak to whether IFRS adoption is doing something above and beyond the simple channel of foreign investors (integration effect), along the lines of the motivation behind my cross-sectional tests. Under this alternative specification I find that the coefficient on the IFRS variable is weakly positive and significant (0.11, $p<0.10$) indicating that liquidity volatility increases when a country adopts IFRS, controlling for the increases in foreign investment flows. While the coefficient on the FPI is, as expected, strongly positive (0.09, $p<0.01$), indicating that local market liquidity volatility is increasing in foreign portfolio investment inflows. However, we cannot infer too much from these results as this does not directly test the impact of foreign shocks on local markets, simply that the total volatility in local markets increased following IFRS adoption.

("IFRS-earnings quality") adapted from Leuz et al. [2003]. I partition the sample into High and Low countries based on whether they are above or below the median of the sample distribution. Table 8 shows the results from partitioning the sample into High and Low IFRS reporting impact. I find that the increased accounting transparency of IFRS, relative to local GAAP, significantly attenuates incidence of worst return contagion, even after controlling for %change in FPI. Specifically, Panel A shows a negative and significant difference (-0.306, $p<0.05$) between the interaction terms of High and Low IFRS reporting impact countries. Results from Panel B, Table 8, reveal that the association between domestic and foreign market liquidity volatility is also significantly attenuated in the presence of reporting transparency. I find a negative and significant difference between the interaction terms -0.043 ($p<0.10$). This provides support for arguments that IFRS, through an increase in transparency, may actually reduce the risk of cross-border contagion.

Table 9 presents contagion results when partitioning the sample using my second measure of transparency, IFRS-earnings quality measure. Panel A shows that return contagion is attenuated in High earnings quality countries, relative to Low earnings quality countries; a negative and significant difference in the interaction terms of -0.389 ($p<0.05$). Panel B shows the results from my liquidity contagion analysis. Inferences are identical with those reported in Table 8; the increase in transparency brought about by IFRS significantly reduces the impact of foreign market liquidity shocks on domestic market liquidity volatility. It is important to note here that the total average effect of

foreign market liquidity (i.e. $\gamma_1 + \gamma_3$) is not significantly different between sub-samples, as expected. Overall, I find the improvement in reporting transparency due to IFRS partially attenuates the observed increase in cross-border contagion.[31]

[31] In un-tabulated results I perform a 2x2 analysis partitioning the sample into high and low accounting transparency and FPI investment, in order to gain more insight into the interaction between the countering effects of integration and transparency. I find that the observed impact of foreign market liquidity shocks on local markets only manifest in countries where the transparency impact is low (i.e. high FPI country and Low IFRS earnings quality). The integration and transparency effect appear to cancel out in countries that experience both high FPI investment post-IFRS and greatest increase in reporting quality. In addition, I find that the transparency effect is strongest in low FPI investment countries, i.e. impact of foreign market shocks is mitigated, and in fact negative but only mildly significant (coefficient of -0.011, $p<0.10$). Whereas in low reporting quality and low FPI investment countries, the integration effect still dominates.

## Chapter 6

## Concluding remarks

This study documents a consequence of accounting harmonization by showing that IFRS adoption carries a significant capital market cost. A large stream of literature has established that as markets become more integrated they are more susceptible to cross-border contagion risk in the form of localized financial shocks in one market being transmitted to other markets, beyond what economic fundamentals would suggest (Pritsker [2001]). Given a number of studies have documented significant increases in cross-border investment flows among IFRS adopting jurisdictions (DeFond et al. [2011], Florou and Pope [2012], Yu [2011]), I extend these findings to argue and show that this increased market integration of IFRS comes with the consequence of increased cross-border contagion, i.e. excess co-movement in downside returns.

Employing a dataset of approximately 14,000 firms in 35 countries from 2001 through 2010 I document evidence of cross-border contagion among IFRS adopting countries. Specifically, after controlling for common macro-level exposures and bilateral trade linkages, I find significant clustering in the incidence of extreme negative market returns across IFRS adopting countries, relative to the clustering observed across pairs of

countries without harmonized accounting standards. Providing insight into the potential mechanism underlying the documented return contagion, I find that liquidity shocks originating in foreign markets have a significantly greater impact on the variability of local market liquidity when both the foreign and local markets follow IFRS. I show that the threat of foreign liquidity shocks is increasing in the extent of FPI immediate following the adoption of IFRS. That is, while prior studies have shown the benefits of IFRS adoption in broadening access to foreign capital through comparability, familiarity and reductions in information asymmetry, the increased foreign investment opens up domestic markets to the threat of cross-border contagion. This result is robust to a number of different specifications and sensitivity tests

However, given IFRS provides greater transparency that many local GAAPs, this feature of harmonization may actually attenuate or mitigate the extent to which we see cross-border contagion in adopting markets. Studies such as Brunnermeier and Pederson [2009], Acharya and Pederson [2005], and Vayanos [2003] all argue that reduced uncertainty can mitigate the impact of a liquidity shock. Lang and Maffett [2011] build on those arguments and show that accounting transparency can reduce the variability and co-variability of liquidity, especially in the presence of liquidity shocks. Therefore, given that IFRS are generally seen as being more transparent than prior local GAAPs (e.g. Barth et al. [2008]) it may actually attenuate the documented increase in cross-border contagion in countries that experienced the greatest increase in transparency from IFRS. My findings are consistent with these expectations. Results suggest that amongst IFRS adopters, the increased impact of foreign liquidity shocks is attenuated for those firms

and markets with greatest increase in reporting quality post-IFRS. Overall however the increased co-movement stemming from mixing of investor bases (integration effect), resulting from the harmonization of accounting standards outweighs the attenuating effect of increase transparency; the net impact of IFRS adoption being to exacerbate cross-border contagion. This is evidenced by the increase in excess return co-movement and the increased impact of foreign market liquidity shocks on domestic market liquidity volatility, among IFRS adopting countries.

Figure 1A: Export growth (in USD) for IFRS vs non-IFRS adopting countries

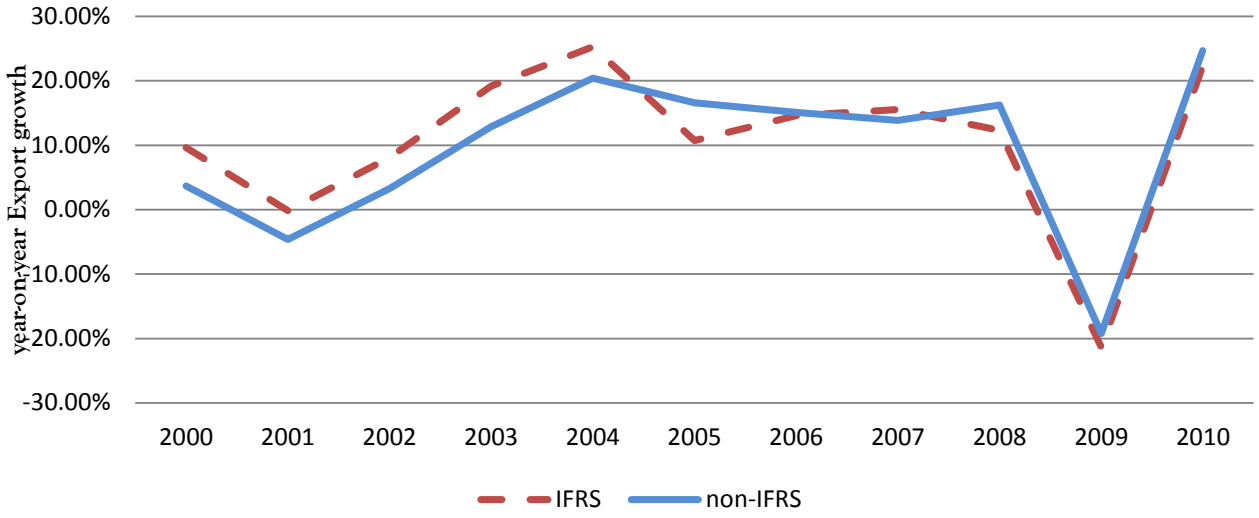


Figure 1B: Foreign Portfolio Investment inflows for IFRS vs non-IFRS adopting countries

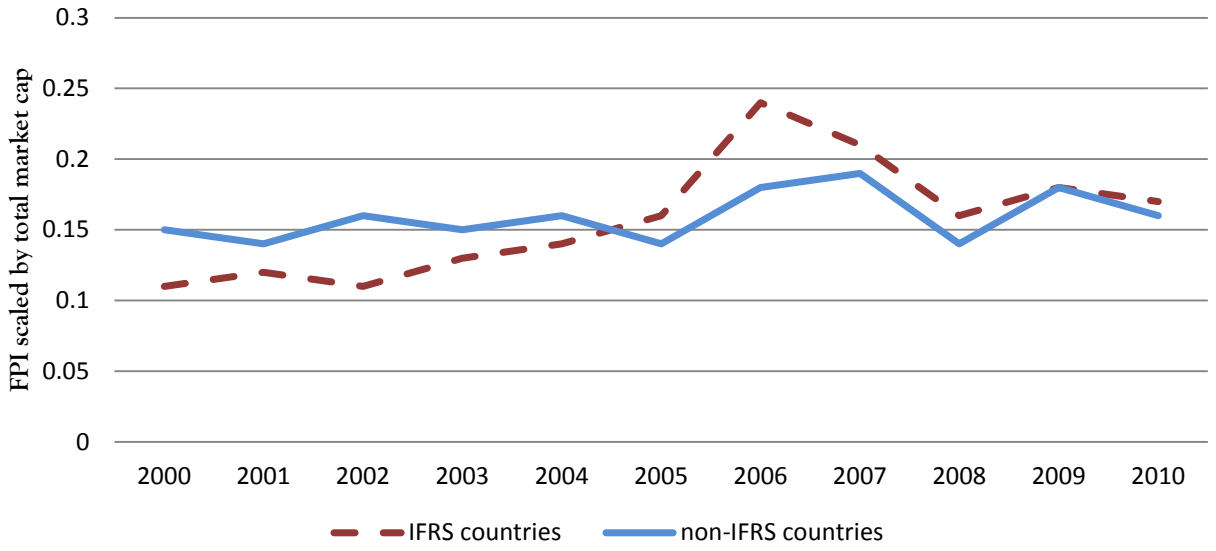


**Figure 1A** shows the average yearly growth in exports for IFRS adopting and non-IFRS adopting countries. The vertical axis is year-on-year export growth in percentage points, while the horizontal axis is the calendar year. Exports are sourced from the UN Trade data website and measured in USD. Countries that adopt IFRS during my sample period are classified as IFRS adopting countries.
**Figure 1B** shows the average foreign portfolio equity investment (FPI) inflows (scaled by beginning of year total market value) for IFRS and non-IFRS adopting countries. The vertical axis is FPI scaled by beginning total market capitalization, and the horizontal axis is the calendar year.

## TABLE 1
## Sample selection process

This table shows the sample selection process to arrive at the final sample. Panel A describes the process by which I obtain and screen Datastream firms. I begin by obtaining a full listing of all Datastream firms with valid DSCODES as of February 2011, and then administer a number of filters in order to ensure I only keep common equity securities traded on their local exchanges with valid weekly (return and market value) data for our sample period, 2001-2010. Panel B then describes the matching of these firms (and their weekly data) to a dataset of GAAP reporting information, to ensure I have correctly identified adopters and non-adopters. I begin with all firms for which Datstream reports "GAAP followed", and then manually check a random sample to actual annual reports. I also obtain the official country-level date given for IFRS adoption from IASplus.com; IASB 2010, and Deloitte IFRS update (2010). In additional Panel B reports the number of weekly observations lost to missing data. Panel C then shows the aggregated number of observations at the country-week level, and the final pairwise sample of country weeks.

| **Panel A: Initial firm selection from Datastream** | | **# Firms** |
|---|---|---|
| | All securities with valid DSCODES as of Feb 2011 (sourced: 49 constituency lists) | 41,010 |
| *Less:* | Securities without valid identifiers | (1,580) |
| *Less:* | Non-equity instruments (i.e. type not equal to "EQ"), non-common shares, and duplicates | (1,189) |
| *Less:* | Exchange traded funds / real estate funds / currency funds/ Investment vehicles | (1,716) |
| *Less:* | Non-primary listings (Primary indicator = "No") | (55) |
| *Less:* | Firms without return data for the sample period (2000-2010) | (5,476) |
| *Less:* | Delisted/dead firms without valid delisting/dead dates | (1,029) |
| *Less:* | Country-level hand checks (Griffin et al., 2008 filters) | (238) |
| | **Total DataStream firms with return data** | **29,727** |

| **Panel B: Final sample selection (firm-weeks)** | | **# firm-weeks** | **# Firms** |
|---|---|---|---|
| | Firm-week return dataset | 16,804,038 | 29,727 |
| *Less:* | firm-weeks with missing/unavailable data for contagion measures | (6,877,697) | (5,574) |
| *Less:* | firm-years with no GAAP information | (3,386,352) | (3,948) |
| *Less:* | Firm-weeks with missing accounting data and ADRs | (726,828) | (1,469) |
| *Less:* | Firms without at least 24 months of data pre- and post-IFRS | (2,441,788) | (3,362) |
| *Less:* | Firm-weeks where less than $50M USD in opening market capitalization | (678,443) | (1,880) |
| | **Final sample of firms used to compute country level indexes** | **2,692,930** | **13,494** |

**TABLE 1 (continued)**

| **Panel C: Final sample selection (Country level)** | **# Ctry-weeks** | **# Country** |
|---|---|---|
| Final sample of country level indexes (Average # firms) | 17,498 | 385 |
| **Matched (pair-wise) sample country-weeks** | **559,936** | **35** |

**TABLE 2**
**Country coverage and IFRS adoption dates**

This table presents the distribution of firms by country for my sample over the period 2001-2010. The average coverage ratio for a country is equal to the total market capitalization of my firm sample in that country (denominated in U.S. dollars), measured at the end of each year, divided by the total market capitalization for that country (as reported by the World Bank), and then averaged across years. World Bank market capitalization includes only listed domestic companies at the end of the year, exclusive of investment companies, mutual funds, and other collective investment vehicles. I also report the fiscal period of mandatory IFRS adoption for each country. In most instances these dates represent the first fiscal period end where IFRS reporting is required. I obtain information on IFRS adoption dates from IASPlus website maintained by Deloitte, and from press releases from the IASB. Note that in the instance of Australia the first fiscal year-end under IFRS is 31-Dec-2005, however given 85% of firms have a June year-end, the more appropriate country-level mandatory adoption date is 30-June-2006.

| Country | % of total mkt cap 1999-2010 | # firms | IFRS Adoption date: Fiscal period end 2001-2010 |
|---|---|---|---|
| Argentina | 27% | 65 | IFRS not mandatory |
| Australia | 71% | 548 | 30-Jun-06 |
| Austria | 44% | 145 | 31-Dec-05 |
| Belgium | 66% | 201 | 31-Dec-05 |
| Brazil | 26% | 247 | 31-Dec-10 |
| Canada | 74% | 743 | IFRS not mandatory |
| Chile[1] | 63% | 82 | 31-Dec-09 |
| China[2] | 37% | 583 | IFRS not mandatory |
| Denmark | 59% | 214 | 31-Dec-05 |
| Finland | 42% | 171 | 31-Dec-05 |
| France | 65% | 782 | 31-Dec-05 |
| Germany | 59% | 911 | 31-Dec-05 |
| Greece | 69% | 344 | 31-Dec-05 |
| Hong Kong | 60% | 635 | 31-Dec-05 |
| India | 59% | 685 | IFRS not mandatory |
| Indonesia | 75% | 327 | IFRS not mandatory |
| Ireland | 78% | 97 | 31-Dec-05 |
| Israel | 39% | 204 | 31-Dec-08 |
| Italy | 70% | 392 | 31-Dec-05 |
| Japan[3] | 73% | 964 | IFRS not mandatory |
| Malaysia | 79% | 488 | IFRS not mandatory |
| Mexico | 37% | 84 | IFRS not mandatory |
| Netherlands | 52% | 134 | 31-Dec-05 |
| New Zealand | 67% | 256 | 31-Dec-07 |
| Norway | 48% | 192 | 31-Dec-05 |

**TABLE 2 (continued)**

| | | | |
|---|---|---|---|
| Portugal | 55% | 111 | 31-Dec-05 |
| Singapore[4] | 67% | 667 | (FRS) 31-Dec-03 |
| South Africa | 27% | 556 | 31-Dec-05 |
| South Korea | 51% | 734 | IFRS not mandatory |
| Spain | 32% | 165 | 31-Dec-05 |
| Sweden | 66% | 342 | 31-Dec-05 |
| Switzerland | 61% | 138 | 31-Dec-05 |
| Taiwan | 61% | 318 | IFRS not mandatory |
| Thailand | 79% | 301 | IFRS not mandatory |
| Turkey | 53% | 289 | 31-Dec-05 |
| UK | 47% | 966 | 31-Dec-05 |
| **Total (yearly)** | **71%** | **13,494** | |

[1]: Chile had a staggered IFRS adoption. Major listed open corporations (i.e. > 500 shareholders) were required to prepare IFRS statements for financial periods beginning on or after 1 January 2009, with smaller listed open corporations (i.e. <500 shareholders) to adopt IFRS from 1 January 2010. All other entities were then permitted, but not required, to prepare IFRS financial statements from 1 January 2011.

[2]: It is noted that China has not officially adopted IFRS, be it mandatory or voluntary. However they have undertaken substantial convergence with their newly issued national standards (ASBEs) that are mandatory for all listed companies from 1 January 2007. Notwithstanding, enough differences exist (e.g. impairment of assets, related party disclosure provisions and certain fair value provisions) that I have classified China as a non-adopter, consistent with prior studies (e.g., Christensen et al. [2012]). Given recent statements by the Chinese government, it seems unlikely that they will mandate full adoption of IFRS any time in the near future.

[3]: While Japan has not yet mandated the use of IFRS, they have allowed mandatory adoption for consolidated reports of listed entities for fiscal periods ending 31 March 2010. An expanded random sample of several companies revealed that only a small number of firms had chosen to voluntarily adopt , therefore Japan is classified as a non-adopter for the purposes of this study. Sensitivity testing is undertaken to ensure this classification does not significantly impact the main results, given the large number of Japanese observations.

[4]: Note that Singapore has not officially adopted IFRS as issued by the IASB, however closely models its Financial Reporting Standards (FRS) according to the IFRS. Before a standard is enacted, consultations with the IASB are made to ensure consistency of core principles. Therefore, consistent with Christensen et al. [2012] I code Singapore as an IFRS adopter.

## TABLE 3

### Descriptive Statistics

This table shows the descriptive statistics of variables across the full sample of 17,498 country-weeks from 2001-2010, along with country-level means of the liquidity volatility and returns. Variables are defined as follows: RET is the country level weekly return (equal weighted) of locally traded, non-MNC, common equity firms; LIQVOL is the average weekly volatility of the Amihud (2002) daily price impact measure (DPI) for all firms in a given country, where DPI = |Rid| / (Pid*VOLid), higher values of DPI indicate greater illiquidity, i.e. price impact of trades was higher; SIZE is the natural log of market value measured at the beginning of the calendar week of firm i in week t, averaged over all firms within a given country; STDRET is the weekly standard deviation of the daily returns for a given country in week t; ILLIQ is the average of the aggregated DPI measure for a given country in week t; LOSS is the proportion of years that the firm i experienced a loss in the last three fiscal year, averaged at the country level; IFRS is an indicator variable set to one if the country is following IFRS reporting in a given week, and zero otherwise.

| **Panel A: Full sample** | **N** | **Mean** | **Std** | **Median** |
|---|---|---|---|---|
| Ret | 17,498 | 0.017 | 0.158 | 0.005 |
| LiqVol | 17,498 | 0.488 | 2.126 | 0.014 |
| Size | 17,498 | 12.955 | 1.318 | 12.065 |
| StdRet | 17,498 | 0.026 | 0.015 | 0.023 |
| Illiq | 17,498 | 0.397 | 1.342 | 0.021 |
| Loss | 17,498 | 0.149 | 0.284 | 0.000 |
| IFRS (proportion of weeks) | 17,498 | 0.364 | 0.420 | 0.000 |

**Table 3 (continued)**

| Panel B: By Country | N (firm-weeks) | Ret (%) | LiqVol |
|---|---|---|---|
| | | Mean | Mean |
| Argentina | 5,424 | 0.358 | 0.573 |
| Australia | 140,324 | 0.281 | 0.421 |
| Austria | 10,048 | 0.162 | 0.426 |
| Belgium | 23,160 | 0.115 | 0.428 |
| Brazil | 18,656 | 0.566 | 0.744 |
| Canada | 214,188 | 0.246 | 0.413 |
| Chile | 4,146 | 0.396 | 0.663 |
| China | 180,662 | 0.376 | 0.085 |
| Denmark | 4,339 | 0.141 | 0.475 |
| Finland | 20,848 | 0.223 | 0.326 |
| France | 113,520 | 0.179 | 0.623 |
| Germany | 96,816 | 0.101 | 0.563 |
| Greece | 38,752 | -0.028 | 0.956 |
| Hong Kong | 120,625 | 0.332 | 0.396 |
| India | 45,302 | 0.523 | 0.441 |
| Indonesia | 8,897 | 0.323 | 1.132 |
| Ireland | 10,398 | 0.185 | 0.654 |
| Israel | 32,069 | 0.291 | 0.326 |
| Italy | 40,162 | 0.026 | 0.712 |
| Japan | 440,344 | 0.120 | 0.512 |
| Malaysia | 75,188 | 0.161 | 0.396 |
| Mexico | 12,340 | 0.368 | 1.033 |
| Netherlands | 28,986 | 0.123 | 0.488 |
| New Zealand | 16,252 | 0.162 | 0.416 |
| Norway | 8,962 | 0.202 | 0.844 |
| Portugal | 5,786 | 0.078 | 0.981 |
| Singapore | 80,427 | 0.190 | 0.319 |
| South Africa | 32,573 | 0.312 | 0.843 |
| South Korea | 224,344 | 0.239 | 0.512 |
| Spain | 32,303 | 0.116 | 0.612 |
| Sweden | 36,455 | 0.203 | 0.286 |
| Switzerland | 24,154 | 0.166 | 0.217 |
| Taiwan | 160,575 | 0.177 | 0.663 |
| Thailand | 44,543 | 0.288 | 0.905 |
| Turkey | 32,417 | 0.616 | 0.102 |
| UK | 259,744 | 0.211 | 0.331 |

## TABLE 4
## Return contagion amongst IFRS adopters

This table shows the results from a parametric test of contagion. Specifically, I run a logit regression where the dependent variable is an indicator variable set to one if the local market index has a return in the bottom 10th percentile (a "worst return") of that market's entire time series of returns, and zero otherwise. The key independent variable, *For_Mkt_Worst* is also an indicator variable that is set to one if the matched foreign market index has a "worst return" in the previous week. Effectively, this analyses provides statistical evidence about the conditional probability that local market return is below a given threshold when the matched foreign market returns also fall below the same worst case threshold. I then interact this variable with another indicator variable, *Both_IFRS*, which is set to 1 in weeks where *both* the domestic and foreign country report under IFRS, and zero all other weeks. The interaction term (*For Market Worst * Both_IFRS)*, then captures the incremental impact on the relation between domestic and lagged foreign worst returns among IFRS adopting jurisdictions. I also include *Exports* to control for bilateral trade linkages between countries, which captures the change in exports from the domestic country to the foreign country; and *Enf* which controls for the capital market enforcement in the domestic country. Note that the coefficient on the enforcement control could be either positive or negative depending on whether the integration or transparency effect is stronger in determining worst returns. I include country, and year fixed effects, however in the interests of parsimony coefficients have been omitted from this table. I report standard errors in parentheses under the parameter estimates, with significance based on two-tailed tests. All continuous non-logarithmic variables are truncated at the 1st and 99th percentiles. Statistical significance is indicated by ***p<0.01, **p<0.05, *p<0.10 (two-sided).

| **Variables** | Predicted sign | "Worst Returns" Pr (Ret < p10) | "Best Returns" Pr (Ret > p90) |
|---|---|---|---|
| *(For_Mkt_Worst * Both_IFRS)* | (+) | 0.402 *** *[0.082]* | 0.119 * *[0.062]* |
| Foreign Market Worst *(For_Mkt_Worst)* | (+) | 0.859 *** *[0.016]* | 0.623 *** *[0.021]* |
| *Both_IFRS* | ? | -0.578 *** *[0.096]* | 0.468 ** *[0.265]* |
| Bilateral Exports *(Exports)* | + | 0.943 ** *[0.431]* | 0.894 *** *[0.468]* |
| Enforcement cluster (*Enf*) | -/+ | -0.961* *[0.511]* | -0.384 *[0.315]* |
| Fixed effects | | Ctry, Yr | Ctry, Yr |
| Clustered S.E. | | Country | Country |
| N | | 559,936 | 559,936 |
| Psuedo R-sqr | | 17.36% | 15.96% |
| Odd ratio estimate (Interaction)<br>*Confidence interval* | | 1.920<br>*(1.906 – 1.948)* | 1.172<br>*(1.062 – 1.298)* |

**TABLE 5**
**Relation between changes in domestic liquidity and changes in foreign market liquidity**

This table shows the results for equation (1) as follows:

$$\%\Delta WPI_{m,t} = a_1 + \varphi_1 \%\Delta WPI_{f,t} + \varphi_2 Both\_IFRS_{f,m,t} + \varphi_3 (\%\Delta WPI_{f,t} * IFRS_{f,i,t}) + \epsilon_{m,t} \quad (1)$$

Where the prefix, %Δ denotes the percentage change from t-1 to t of the relevant variables; $WPI_{m,t}$ is the average of $WPI_{i,t}$ across all firms in local market *m* for week t, where $WPI_{i,t}$ is the average daily price impact (DPI) for firm i in week t, where DPI is defined as the absolute change in price on a given day divided by the USD dollar volume on that day (Amihud [2002]); $WPI_{f,t}$ is the average DPI across all firms in foreign market *f* (i.e. all other markets not m) in week t; and *Both_IFRS* is an indicator set to one when both country m, and foreign market *f* report under IFRS, else set to zero. The interaction term ($\%\Delta WPI_{f,t} * Both\_IFRS_{f,i,t}$), then captures the incremental impact on the relation between changes in local market and foreign market liquidity. Observations are at the country-week-foreign level, i.e. each firm week is matched to all other countries in a given week. Given the dependent variable is repeated, I cluster standard errors at the country-week level. I include country-pair and year fixed effects, however these coefficients have been omitted from the tabulated results. I report t-statistics in parentheses under the parameter estimates, with significance based on two-tailed tests. Note that liquidity measures enter the regression as natural logs in order to mitigate issues with distributional assumptions required by OLS. Statistical significance is indicated by ***p<0.01, **p<0.05, *p<0.10 (two-sided).

| **Variables** | Predicted sign | Change in domestic Liquidity *(%chg WPI)* |
|---|---|---|
| $(\%\Delta WPI_{f,t} * Both\_IFRS_{f,i,t})$ | (+) | 0.056 *** *[3.32]* |
| Weekly % change in Foreign market liquidity $(\%\Delta WPI_{f,t})$ | (+) | 0.062 *** *[5.42]* |
| *Both_IFRS* | ? | -0.054 ** *[2.17]* |
| Fixed effects | | Ctry-pair, Yr |
| Clustered S.E. | | Country |
| N | | 595,498 |
| Adjusted R-sqr | | 11.36% |

## TABLE 6
## Relation between domestic and foreign-market liquidity volatility (Liquidity Contagion)

This table shows the relation between local market liquidity volatility and foreign market liquidity volatility, pre- and post-IFRS, controlling for established determinants. It reports results for market-level liquidity volatility on lagged foreign market-level liquidity volatility. Observations are at the domestic-market-to-foreign-market-weekly level, i.e. each market week is matched to all other market-weeks. Given the dependent variable is repeated, I cluster standard errors at the market-level. I regress market-week liquidity volatility on lagged *For_Mkt_Liqvol, Both_IFRS* and the interaction. These variables are defined as follows: *Mkt_Liqvol* is the natural log of the average weekly volatility (*Liqvol*) for all firms in domestic country, d, for week t, where L*iqvol* is the weekly volatility of the Amihud (2002) daily price impact measure (DPI), where DPI = $|R_{id}|$ / ($P_{id}$*$VOL_{id}$), higher values of DPI indicate greater illiquidity, i.e. price impact of trades was higher, $R_{id}$ is the percentage change in price for firm i on day d, and $VOL_{id}$ is the total volume (in thousands) for firm i on day d, and $P_{id}$ is the price in USD for firm i on day d; *For_Mkt_Liqvol* is *Mkt_Liqvol* for all countries other than country j, i.e. matched foreign countries; *IFRS* is an indicator variable set to 1 if both the domestic firm and the matched foreign market follow IFRS in week t, and zero otherwise. I also include the following control variables: *Exports* to control for bilateral trade linkages between countries, which captures the natural log of annual change in exports from the domestic country to the foreign country over the current calendar year; *Illiq* to control for the average level of market liquidity, measured as the average of the aggregated DPI measure for a given country in week t; Ret is the natural log of the domestic country return in week t, note this is constructed as the equal weighted return using my sample of firms for a given country; *Enf* which controls for the capital market enforcement in the domestic country. The variable of primary interest is the interaction term,(*For_Mkt_Liqvol * IFRS)*, this captures the incremental impact on the relation between domestic and lagged foreign liquidity volatility among IFRS adopting jurisdictions. I include country, and year fixed effects, however in the interests of parsimony coefficients have been omitted from this table. I report t-statistics in parentheses under the parameter estimates, with significance based on two-tailed tests. All continuous variables are truncated at the 1st and 99th percentiles. Statistical significance is indicated by ***p<0.01, **p<0.05, *p<0.10 (two-sided).

| **Variables** | Predicted sign | Domestic Market-level Liquidity volatility *(Mkt_Liqvol)* |
|---|---|---|
| *(For_Mkt_Liqvol * Both_IFRS)* | (+) | 0.068 ** *[2.19]* |
| Foreign Market Liquidity Volatility *(For_Mkt_Liqvol)* | (+) | 0.523 ** *[2.35]* |
| *Both_IFRS* | ? | -0.037 * *[-1.88]* |
| Bilateral Trade linkages *(Exports)* | (+) | 0.024 *** *[4.39]* |
| Average market-level Liquidity *(Illiq)* | (+) | 0.242*** *[10.23]* |
| Return (*Ret*) | (-) | -1.114 *** *[6.29]* |
| Enforcement cluster (from Leuz 2010) | -/+ | -0.081 ** *[2.64]* |
| Fixed effects | | Ctry-pair, Yr |
| Clustered S.E. | | Country |
| N | | 559,936 |
| Adjusted R-sqr | | 49.96% |

**TABLE 7**
**Cross-border Contagion for High Vs Low FPI post IFRS**

This table shows return contagion results (Panel A) and liquidity contagion results (Panel B) for IFRS adopters, partitioned into High FPI countries and Low FPI countries. High (Low) FPI countries are those countries who experienced the largest (smallest), i.e. above (below) median, percentage change in FPI inflows in the two years following IFRS adoption, Panel A displays logit results for return contagion in worst returns and Panel B shows the OLS results for Liquidity volatility. All variables are defined as in Table 4 and 6. Note that only countries that adopt IFRS at some point during our sample period of 2001-2010 are included in this analysis. As in prior analysis I cluster standard errors at the country-week level, and include fixed effects at the country-pair and year level. I report standard errors in parentheses under the parameter estimates, with significance based on two-tailed tests.

| **Variables** | High %Δ FPI post-IFRS | | Low %Δ FPI post-IFRS | | Diff | |
|---|---|---|---|---|---|---|
| **Panel A: Worst Returns (Ret < p10)** | | | | | | |
| *For_Mkt_Worst*Both_IFRS* | 0.526 | *** | 0.124 | ** | 0.402 | *** |
| | *[0.095]* | | *[0.065]* | | *p<0.01* | |
| *For_Mkt_Worst* | 0.994 | *** | 0.742 | ** | | |
| | *[0.045]* | | *[0.036]* | | | |
| *Both_IFRS* | -0.547 | *** | -0.421 | *** | | |
| | *[0.165]* | | *[0.184]* | | | |
| *Bilateral Exports* | 1.195 | ** | 0.899 | ** | | |
| | *[0.568]* | | *[0.486]* | | | |
| Other Controls | Yes | | Yes | | | |
| N | 265,074 | | 294,863 | | | |
| Psuedo R-sqr | 18.35% | | 14.63% | | | |
| **Panel B: Liquidity Volatility** | | | | | | |
| *For_Mkt_Liqvol*Both_IFRS* | 0.069 | *** | 0.017 | ** | 0.052 | *** |
| | *[0.013]* | | *[0.007]* | | *p<0.01* | |
| *For_Mkt_Liqvol* | 0.046 | *** | 0.068 | *** | | |
| | *[0.007]* | | *[0.016]* | | | |
| *Both_IFRS* | 0.005 | | 0.010 | ** | | |
| | *[0.003]* | | *[0.005]* | | | |
| *Bilateral Exports* | 0.053 | *** | 0.048 | *** | | |
| | *[0.011]* | | *[0.021]* | | | |
| Other Controls | Yes | | Yes | | | |
| N | 265,074 | | 294,863 | | | |
| Adjusted R-sqr | 37.65% | | 39.85% | | | |

**TABLE 8**
**Cross-border Contagion for High Vs Low IFRS reporting impact**

This table shows return contagion results (Panel A) and results of the relation between firm-level liquidity volatility and domestic market and foreign market liquidity for IFRS adopters, partitioned into High and Low IFRS reporting impact, based on the established country level "accounting distance" metric (see Yu [2011], Bae et al. [2008]). This measures the extent of differences between local GAAP and IFRS, I anticipate those with the greatest accounting distance had the biggest improvement in IFRS-induced transparency (and biggest impact on comparability). Panel A reports Logit results for worst return contagion, and Panel B reports OLS results for liquidity volatility. All variables are defined as in Table 4 and 6. Note that only countries that adopt IFRS at some point during our sample period of 2001-2010 are included in this analysis. As in prior analysis I cluster standard errors at the country-week level, and include fixed effects at the country and year level. I report robust standard errors in parentheses under the parameter estimates, with significance based on two-tailed tests.

| **Variables** | High IFRS reporting impact | | Low IFRS reporting impact | | Diff | |
|---|---|---|---|---|---|---|
| **Panel A: Worst Returns (Ret < p10)** | | | | | | |
| *For_Mkt_Worst*Both_IFRS* | 0.193 | ** | 0.499 | ** | -0.306 | ** |
| | *[0.067]* | | *[0.079]* | | *p<0.05* | |
| *For_Mkt_Worst* | 0.982 | *** | 0.735 | ** | | |
| | *[0.046]* | | *[0.037]* | | | |
| *Both_IFRS* | -0.670 | *** | 0.131 | | | |
| | *[0.201]* | | *[0.101]* | | | |
| *%Δ FPI post-IFRS* | 0.399 | ** | 0.316 | ** | | |
| | *[0.201]* | | *[0.175]* | | | |
| Other Controls | Yes | | Yes | | | |
| N | 277,168 | | 282,768 | | | |
| Psuedo R-sqr | 17.31% | | 13.68% | | | |
| **Panel B: Liquidity Volatility** | | | | | | |
| *For_Mkt_Liqvol*Both_IFRS* | 0.031 | * | 0.074 | ** | -0.043 | ** |
| | *[0.016]* | | *[0.025]* | | *p<0.05* | |
| *For_Mkt_Liqvol* | 0.087 | *** | 0.071 | *** | | |
| | *[0.021]* | | *[0.016]* | | | |
| *Both_IFRS* | *-0.051* | ** | *0.009* | * | | |
| | *[0.025]* | | *[0.004]* | | | |
| *%Δ FPI post-IFRS* | 0.010 | * | 0.018 | ** | | |
| | *[0.005]* | | *[0.008]* | | | |
| Other Controls | Yes | | Yes | | | |
| N | 277,168 | | 282,768 | | | |
| Adjusted R-sqr | 42.35% | | 49.12% | | | |

**TABLE 9**
**Cross-border Contagion for High Vs Low IFRS-Earnings Quality**

This table shows return contagion results (Panel A) and liquidity contagion results (Panel B) partitioned into High and Low IFRS-earnings quality groups. IFRS-earnings quality is defined as the difference between pre-IFRS and post-IFRS country-level aggregate earnings quality, measured as per Leuz et al. [2003]. I anticipate among those firms in countries with the greatest increase in IFRS-earnings quality, as a proxy for transparency, the spread of adverse (liquidity) shocks should be mitigated. Panel A reports Logit results of worst return contagion, and Panel B reports OLS results on correlation between foreign liquidity volatility on domestic volatility. All variables are defined as in Table 4 and 6. Note that only countries that adopt IFRS at some point during our sample period of 2001-2010 are included in this analysis. As in prior analysis I cluster standard errors at the country-week level, and include fixed effects at the country-pair and year level. I report robust standard errors in parentheses under the parameter estimates, with significance based on two-tailed tests.

| **Variables** | High IFRS-Earnings Quality | Low IFRS-Earnings Quality | Diff |
|---|---|---|---|
| **Panel A: Worst Returns (Ret < p10)** | | | |
| *For_Mkt_Worst*Both_IFRS* | 0.135 * | 0.524 *** | -0.389 *** |
| | *[0.074]* | *[0.084]* | *p<0.01* |
| *For_Mkt_Worst* | 0.934 *** | 0.699 ** | |
| | *[0.046]* | *[0.039]* | |
| *Both_IFRS* | *-0.594* ** | *-0.012* * | |
| | *[0.234]* | *[0.007]* | |
| *%Δ FPI post-IFRS* | 0.345 * | 0.294 ** | |
| | *[0.211]* | *[0.134]* | |
| Other controls | Yes | Yes | |
| N | 276,608 | 283,328 | |
| Psuedo R-sqr | 16.97% | 14.21% | |
| **Panel B: Liquidity Volatility** | | | |
| *For_Mkt_Liqvol*IFRS* | 0.033 * | 0.074 *** | -0.041 ** |
| | *[0.017]* | *[0.023]* | *p<0.05* |
| *For_Mkt_Liqvol* | 0.081 *** | 0.069 *** | |
| | *[0.013]* | *[0.015]* | |
| *Both_IFRS* | *-0.064* * | *0.007* * | |
| | *[0.034]* | *[0.004]* | |
| *%Δ FPI post-IFRS* | 0.009 * | 0.012 ** | |
| | *[0.004]* | *[0.006]* | |
| Other controls | Yes | Yes | |
| N | 276,608 | 283,328 | |
| Adjusted R-sqr | 44.40% | 48.12% | |

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