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Cross-border regulatory cooperation and analyst forecasts

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ABSTRACT

Using the staggered entry of foreign countries into the Multilateral Memorandum of Understanding (MMoU) as a shock to the cross-border regulatory cooperation and information exchange, we find that foreign firms cross-listed in the U.S. show a greater level of analyst following and a significant reduction in analyst forecast error and dispersion after their foreign home countries join the MMoU. Furthermore, the effect of the MMoU on analysts tends to be stronger for cross-listed firms with a greater level of information opacity and for analysts with greater difficulty forecasting cross-listed firms. To examine the potential channel, we find an increase in information/financial statement comparability after the entry of the MMoU by a firm's foreign home country. Collectively, our findings suggest that strengthened cross-border regulatory cooperation has a significant effect on reducing analyst information processing costs.

1. Introduction

In a world of costly information search and complex analysis (i.e., information processing costs), financial analysts fulfill a crucial role in assisting clients in making informed investment decisions through the issuance of analyst earnings forecasts (Barth & Hutton, 2000; Givoly & Lakonishok, 1979; Healy & Palepu, 2001). Given that inaccurate assessments of firms' future earnings can lead to economic losses for clients and negatively impact analysts' own reputation and compensation, understanding the factors influencing information processing costs is of utmost importance to analysts, considering their limited time and resources (Brown, Call, Clement, & Sharp, 2015). Previous studies have explored the impact of various factors at the analyst, brokerage, firm, and country levels on analysts' information processing costs (Cao, Keskek, Myers, & Tsang, 2019; Dhaliwal, Radhakrishnan, Tsang, & Yang, 2012; Griffin, Neururer, & Sun, 2020; Horton, Serafeim, & Serafeim, 2013; Muslu, Mutlu, Radhakrishnan, & Tsang, 2019; Yu, 2010), but we have little knowledge of the factors at an even broader cross-border level: i.e., cooperation among the countries.

Since 2002, many countries have joined the Multilateral Memorandum of Understanding (MMoU) Concerning Consultation and Cooperation and the Exchange of Information.[1] The primary objective of the MMoU is to facilitate cross-border information exchange, thereby enhancing cross-border regulatory enforcement capability and investor protection. Considered as the most comprehensive and stringent standard of cross-border regulatory enforcement to date, this non-binding arrangement for sharing information among global securities regulators has garnered significant attention (Lang, Maffett, Omartian, & Silvers, 2020). In 2002, the U.S. Securities and Exchange Commission (SEC) and securities regulators from prominent developed countries like Australia and Canada were among the first to become signatories to the MMoU. This early participation underscores the commitment to the MMoU's goal of fostering effective cross-border regulatory enforcement. The growing effectiveness of the MMoU is exemplified by the substantial increase in requests for cross-border information exchange, rising from 56 in 2003 to 4064 in 2018. Thus, the entry of foreign countries into the MMoU presents a valuable opportunity to examine the potential impact of cross-border regulatory enforcement and information exchange on analyst information processing costs.

Using the staggered entry of foreign countries into the MMoU as an exogenous shock to the enforcement concern and/or information environment of U.S. cross-listed firms, we examine whether these firms exhibit a significant reduction in their analyst information processing costs after their foreign home countries join the MMoU. We conjecture

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[1] See International Organization of Securities Commissions (IOSCO), "Multilateral Memorandum of Understanding Concerning Consultation and Cooperation and the Exchange of Information (MMoU)." Available at https://www.iosco.org/about/?subsection=mmou (accessed 15 July 2021).

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that, to the extent that the MMoU increases the cross-listed firms' concern about the SEC enforcement (Silvers, 2020a), firms are more likely to exhibit a change in their financial reporting practices (e.g., an increase in their financial statement comparability) to reduce their concern of highlighted regulatory scrutiny post the MMoU (Brown, Ma, & Tucker, 2019). This in turn reduces analysts' information processing costs (De Franco, Kothari, & Verdi, 2011). Additionally, if improved information exchange across borders improves the analyst information environment, we again predict that MMoU would have a positive effect on reducing analysts' information processing costs.

Specifically, in this study, we examine whether cross-listed firms in the U.S. (i.e., those with American Depository Receipts [ADRs]) exhibit a significant reduction in their analyst information processing costs (proxied by the analyst coverage, analyst forecast error, and analyst forecast dispersion) from the pre- to post-MMoU period relative to their domestic counterparts. As cross-listed firms (i.e., the treatment firms) may differ significantly from domestic U.S. firms (i.e., the control firms), we use the propensity score matching (PSM) method to improve the comparability of these treatment and control firms (Guedhami, Pittman, & Saffar, 2014; Lawrence, Minutti-Meza, & Zhang, 2011). By conducting a difference-in-differences (DID) analysis of the sample, we find an increase in analyst coverage, a decrease in analyst earnings forecast errors, and a reduction in analyst earnings forecast dispersion for cross-listed firms after their foreign home countries join the MMoU relative to their U.S. counterparts. These findings support our conjecture that enhanced cross-border regulatory cooperation after the MMoU entry of foreign countries is associated with a reduction of analyst information processing costs.

In cross-sectional tests, our results are more pronounced for cross-listed firms from countries with relatively higher information processing costs (measured by foreign countries' weaker law enforcement, weaker accounting regulations, and greater levels of cultural and language barriers to the U.S.). The results are also stronger for cross-listed firms with greater levels of information opacity (measured by these firms' lower levels of voluntary disclosure, earnings quality, and information/financial statement comparability). In addition to the country- and firm-level variations, we conduct additional tests to examine whether the effect of the MMoU on analyst forecasts varies cross-sectionally with analyst characteristics. Indeed, we find that the effect is stronger for analysts with greater difficulty forecasting cross-listed firms pre-MMoU entry (measured by analysts being from smaller brokerages and having less experience forecasting foreign firms).

We conduct an array of additional tests to ensure the robustness of our results. First, we examine whether the parallel trend assumption underlying our DID analysis is met. Using the dynamic DID model introduced by Bertrand and Mullainathan (2003), we find evidence supporting the argument that the MMoU leads to a significant reduction in analyst information processing costs of foreign firms only after their home countries enter the MMoU. Yet, we find no significant change in the analyst information processing costs of foreign firms before MMoU entry. Second, we find similar results using constant windows before and after MMoU entry (i.e., 5 or 2 years pre- and post-MMoU entry) and using constant firms (firms that existed in both the pre- and post-MMoU periods). Third, our results remain robust after controlling for other global regulatory changes, including Public Company Accounting Oversight Board (PCAOB) inspection, mandatory world-wide International Financial Reporting Standards (IFRS) adoption, and cross-country board reform implementation, observed during our sample period which may also affect analysts' information processing costs. Fourth, our results remain consistent using alternative measures of analysts' information costs including the analysts' forecast frequency, the number of analysts' forecast items, the number of analysts' questions, and the length of analysts' questions in the conference calls.

Finally, although our results suggest a reduction of the information processing costs of analysts after the entry of the MMoU by foreign firms' home countries, we acknowledge that we are unable to directly observe the actual channel through which the MMoU affects analyst forecasts. For example, it is difficult to observe whether better analyst forecasts observed in the post-MMoU period are a result of additional information from foreign countries or whether they are the outcome of better financial reporting practices of the firms. To shed light on the underlying reason for the observed effect of the MMoU on analyst information processing costs, we thus propose and examine one possible channel – the change in firms' information/financial statement comparability post-MMoU entry. This analysis is motivated by prior studies suggesting that when faced with highlighted regulatory enforcement or scrutiny concerns, firms are more inclined to commit to better disclosure quality and thereby provide more comparable financial statements to mitigate such concerns (Brown et al., 2019; Christensen, 2016; Kong, Radhakrishnan, & Tsang, 2017; Matsumura, Prakash, & Vera-Muñoz, 2014). Consistent with our prediction, we present preliminary evidence that cross-listed firms indeed exhibit an increase in their information/financial statement comparability post-MMoU entry compared to their U.S. counterparts.[2] We attribute this finding to the greater incentive of firms in providing information which they may have little incentive to provide before the MMoU. In our view, this finding suggests a plausible and undocumented reason for explaining the effect of the MMoU on analyst forecasts documented by our study.

We contribute to the literature in a few major ways. First, to our knowledge, our paper is among the first in the accounting and finance literature which examines the effect of MMoU on analyst earnings forecasts. Given the crucial role played by the MMoU in cross-border regulatory cooperation and enforcement, recent studies document a significant effect of the MMoU on the legal enforcement of foreign firms (Silvers, 2020a), global mutual funds' foreign portfolios (Lang et al., 2020), management forecasts (Tsang, Xiang, & Yu, 2023), dividend policy (Chen, Chris, Tsang, & Xiang, 2022; Chen, Ma, Martin, & Michaely, 2022), and market liquidity (Silvers, 2017). However, given the importance of analysts as the market participants (Bradshaw, 2009), it is surprising that no study has examined whether and how MMoU would affect analyst information processing costs which in turn play a significant role in their forecast properties. We fill this gap by investigating the role of the MMoU in financial analysts' earnings forecast properties and document a positive effect.

Second, our study contributes to the literature examining factors affecting analyst earnings forecast properties. While most relevant studies focus on the firm-, industry-, or country-level determinants of analyst earnings forecast (Cao et al., 2019; Dhaliwal et al., 2012; Griffin et al., 2020; Horton et al., 2013; Muslu et al., 2019; Yu, 2010), our finding adds to this literature by presenting evidence suggesting the important role which cross-border information exchange between regulators can play in affecting analyst forecast properties and sheds our understanding of the impact of cross-border regulatory enforcement on accounting information and capital market activities.

The remainder of this paper is organized as follows. Section 2 provides background information on the MMoU, reviews the related literature, and develops the hypotheses. Section 3 describes the sample and research design. Sections 4 and 5 present the main empirical results and additional analyses, respectively. Section 6 concludes the paper.

2. Background, literature review, and hypotheses

2.1. Cross-border enforcement mechanism—The MMoU

The MMoU was established by the IOSCO after the events of

[2] We acknowledge that other possible changes (such as better earnings quality, more voluntary disclosure, higher level of earnings smoothness) around the MMoU presumably may also contribute to the findings of improved analyst forecasts in post-MMoU period. Our finding is unchanged even after we control for the possible change in these variables in our analyses.

September 11, 2001, as they triggered concerns surrounding the use of financial markets to fund terrorist activities. To stop terrorism-related financing worldwide, the MMoU standardizes and enhances cross-border cooperation in the enforcement of securities laws and the exchange of information.[3] As stated on the IOSCO website, "The MMoU sets an international benchmark for cross-border co-operation. Established in 2002, it has provided securities regulators with the tools for combating cross-border fraud and misconduct that can weaken global markets and undermine investor confidence." Countries that join the MMoU can exchange various information, such as that on suspicious stock transactions, including (i) the amount purchased or sold; (ii) the time and price of the transaction; (iii) the individual and the bank or broker and brokerage house that handled the transaction; and (iv) the records of all funds and assets transferred into and out of bank and brokerage accounts.

This sharing of cross-border information has been increasingly welcomed by many jurisdictions. As a result, the number of jurisdictions that signed the MMoU increased significantly from 8 in 2002 to 138 in 2019. Furthermore, requests for cross-border information exchange increased substantially (by >71 times) from 56 in 2003 to 4064 in 2018. This highlights the increasing demand for information sharing among the different jurisdictions that have signed the MMoU.[4] It is believed that more cross-border cooperation will help ensure that securities regulators from under-regulated jurisdictions develop the capacity to meet the MMoU's international cooperation standards and protect investors worldwide.

Compared to domestic firms, cross-listed firms are more likely to be affected by cross-border cooperation among securities regulators in countries around the world. Before the MMoU entry, regulators in cross-border settings are often faced with greater friction that leads to weak enforcement, as cross-listed firms are domiciled in one country (i.e., their foreign home country) but trade their securities in another (i.e., their cross-listing host country). Regulators from different countries are constrained by competence or legal authority, information gaps, and jurisdictional complexity. For example, one of the key reasons underlying weak cross-border enforcement is the high information acquisition and processing costs of foreign firms resulting from the lack of a system that facilitates efficient information sharing/exchange between the home and host countries of cross-listed firms (Silvers, 2020a, 2020b). As a result, whether cross-listing in the U.S. poses a real threat to the enforcement of foreign firms has been questioned (Frost & Kinney, 1996; Frost & Pownall, 1994; Lang, Raedy, & Wilson, 2006; Licht, Poliquin, Siegel, & Li, 2018; Naughton, Rogo, Sunder, & Zhang, 2018; Shnitser, 2010).

2.2. Analysts' earnings forecasts and information processing costs

Analysts play an important role in the capital market by facilitating their clients' (i.e., investors') investment decisions (Bradshaw, 2009). This is because investors with limited ability or time to analyze securities may rely on the work of analysts, typically through analyst reports (Barber, Lehavy, McNichols, & Trueman, 2006; Givoly & Lakonishok, 1979; Lys & Sohn, 1990; Womack, 1996). Analysts incur various costs in collecting information, such as information on macroeconomic trends (Hutton, Lee, & Shu, 2012; Jennings, 1987), industry data (Dunn & Nathan, 2005), and firm-specific financial and operating information (Maydybura, Gerace, & Andrew, 2013). To obtain more reliable macroeconomic information, some analysts working at top-tier investment banks may even approach highly regarded (i.e., costly) macroeconomists for their expert knowledge, such as on commodity prices and interest rates and on how such information may affect target firms (Hutton et al., 2012; Jennings, 1987). It is also important for analysts to keep abreast of new regulations or policies that may affect the industry (e.g., Hutton et al., 2012). For industry information, analysts closely follow recent trends in business practices, products, and industry competition (Dunn & Nathan, 2005). Analysts also have an incentive to maintain cordial relationships with managers for better informational assess (Bradshaw, 2011; Bushee, Jung, & Miller, 2017; Chen & Matsumoto, 2006; Das, Levine, & Sivaramakrishnan, 1998; Francis & Philbrick, 1993; Lim, 2001; Matsumoto, 2002; Soltes, 2014; Wong & Zhang, 2014).

Furthermore, it has been documented that more complex financial statements require more time and effort to extract relevant information, which increases the information processing costs for investors (e.g., Bloomfield, 2002). To this end, regulators have long voiced concerns about excessively lengthy and complex financial statements (Guay, Samuels, & Taylor, 2016).[5] Despite the efforts of regulators in reducing investors' information process costs, concerns remain that financial statement complexity adversely affects both unsophisticated and sophisticated investors. For example, KPMG (2011) finds that the complexity of financial statements and associated information processing costs have continued to grow due to changes in disclosure requirements.

2.3. Hypothesis development

As mentioned earlier, the MMoU was established to protect investors by fostering cross-border information exchange between regulators and to fill the gaps in cross-border regulatory enforcement capacities. For example, securities regulators in the U.S. can request information about insider dealing and the misrepresentation of material information from firms' foreign home countries after the foreign countries entered into the MMoU. Research has indicated that foreign firms' concerns about regulatory enforcement or scrutiny increase significantly after their home countries join the MMoU (Silvers, 2020a). Studies suggest that when firms face heightened concerns regarding regulatory enforcement or scrutiny, they are more likely to engage in actions that enhance disclosure quality and provide financial statements that are more comparable to their peers. These actions serve as a means to alleviate such concerns (Brown et al., 2019; Christensen, 2016; Kong et al., 2017; Matsumura et al., 2014). Lending support to this view, Brown et al. (2019) find that firms providing financial information that is more comparable to their industry peers experience reduced concerns regarding regulatory scrutiny. They find that firms with less comparable financial statements are more prone to receiving SEC comment letters, especially on financial statement issues. This can be attributed to the fact that individuals have expectations about what is considered normal in a given situation and pay special attention to deviations from the norm (Kahneman, 2011).

Taken together, to the extent that improved cross-border regulatory cooperation and information exchange increases firms' concern of regulatory enforcement and scrutiny, and committing to better financial

[3] See IOSCO (2003), "Final Communiqué of the XXVIIIth Annual Conference of the International Organization of Securities Commissions." Available at https://www.iosco.org/news/pdf/IOSCONEWS61-English.pdf (accessed [Access January 3, 2020]).

[4] Given the MMoU's importance, the G20 further encourages the IOSCO to not only maintain high-quality cross-border enforcement cooperation for the countries that have joined the MMoU but also to make efforts to deal with uncooperative jurisdictions in the areas of securities regulation, market conduct, and prudential supervision.

[5] For example, initiatives to reduce information processing costs include the FASB's "Disclosure Framework Project" in 2009 and "Simplification Initiative" in 2014, the SEC's "Disclosure Effectiveness Initiative" in 2013, the IASB's "Disclosure Initiative" in 2013, and the UK Financial Reporting Council's "Cutting Clutter" initiative in 2011.

reporting practices (such as providing more comparable financial statements) can reduce such a concern, we predict that analysts have lower information processing costs in the post-MMoU period.[6]

Taken together, the discussions above lead to our first hypothesis:

H1. Compared to U.S. domestic firms, U.S. cross-listed firms have lower analyst information processing costs after the entry of the MMoU by the firms' foreign countries.

The literature has long recognized that differences in country-level institutional development (e.g., disclosure requirement and legal enforcement levels) are important determinants of analyst information processing costs (Barniv, Myring, & Thomas, 2005; Byard, Li, & Yu, 2011; Neel, 2017). For example, Byard et al. (2011) find that for mandatory IFRS adopters domiciled in countries with both weak enforcement regimes and domestic accounting standards that differ significantly from those of the IFRS, analyst forecast errors and dispersion decrease more for firms from countries where financial reporting is less transparent. Given the importance of country-level institutions in affecting analyst earnings forecasts and/or the level of firms' information opacity, we further predict that cross-listed firms from countries characterized by relatively weaker country-level institutional development and greater communication barriers to the U.S. are likely to exhibit the greater extent of the reduction in analyst information processing costs post-MMoU entry. The above discussion formulates our second hypothesis:

H2. The effect of MMoU entry on analysts' information processing costs is stronger for weaker country-level institutional development and greater communication barriers to the U.S.

Studies show that corporate disclosure quality and financial statement comparability are important determinants of analyst information processing costs (Byard & Shaw, 2003).[7] Greater financial statement comparability can presumably improve analysts' forecasts due to its role in reducing analyst information costs to gather and process firm-specific information (Choi, Choi, Myers, & Ziebart, 2019; De Franco et al., 2011). Therefore, we predict that the effect of the MMoU on analyst earnings forecasts may also vary with the firm-specific information environment and financial reporting practices. To the extent that the enhanced cross-border regulatory enforcement after foreign countries' entry into the MMoU improves the corporate disclosure quality and financial statement comparability, cross-listed firms with lower levels of voluntary disclosure and less financial information comparability before the firms' MMoU entry are expected to be associated with greater levels of reduction in the analyst information processing costs after their home countries sign/enter the MMoU. The above discussion gives rise to our third hypothesis:

H3. The effect of MMoU entry on analysts' information processing costs is stronger for lower corporate disclosure quality and lower financial statement comparability.

Studies also show that the analyst information processing costs can be affected by analysts' forecast experience (e.g., Bradley, Gokkaya, & Liu, 2017; Clement & Tse, 2005; Jacob, Lys, & Neale, 1999; Mikhail, Walther, & Willis, 1997) and brokerage size (e.g., Clement, 1999; Herrmann & Thomas, 2005). For example, Bradley et al. (2017) find that analysts making forecasts on firms in industries related to their pre-analyst experience have better forecast accuracy and evoke stronger market reactions to earnings revisions.[8] Similarly, analysts at smaller brokerage firms are more likely to incur relatively higher costs than analysts at larger brokerage firms to gather information and provide an equally accurate forecast (Herrmann & Thomas, 2005). Taken together, information processing costs are probably higher for analysts with fewer resources and less experience, especially when the analysts are making forecasts for global firms pre-MMoU entry. The above discussion leads to our fourth hypothesis:

H4. The effect of MMoU entry on analyst information processing costs is stronger for analysts with fewer resources and less experience.

Fig. 1 in the following shows the analytical thinking logic of our study. In this study, we propose four research hypotheses, among which hypotheses H2 to H4 are the heterogeneity test of hypothesis H1. Specifically, regarding hypothesis H1, we examine whether cross-listed firms in the U.S. exhibit a significant reduction in their analyst information processing costs from the pre- to post-MMoU period relative to their domestic counterparts. Combining the hypotheses H2 to H4, we conduct an array of cross-sectional tests to examine the impact of heterogeneity at the country-level characteristics through law enforcement, accounting regulation, cultural distance, and language systems; firm-level characteristics through voluntary disclosure, earnings opacity, information comparability, and financial statement comparability; the analyst-level characteristics through the experience and resources of the individual analyst, respectively.

3. Variable definitions and research design

3.1. Sample

Our sample includes quarterly observations of ADR and non-ADR U.S. firms from 2000 to 2018. Following previous studies, foreign firms cross-listed in the U.S. are defined based on ADRs (Bronson, Ghosh, & Hogan, 2017).[9] We collect quarterly analyst earnings forecasts from the Institutional Brokers' Estimate System database and financial data from Compustat North America. We eliminate ADR firm-quarter observations with missing analyst earnings forecast data and financial data that are necessary to conduct our multivariate tests.

To address concerns regarding the fundamental differences between ADR and non-ADR U.S. firms that may influence analyst information processing costs, we use the PSM method to match each ADR firm-quarter observation with a non-ADR U.S. firm-quarter observation (Bronson et al., 2017; Hope, Kang, & Kim, 2013). We use one-to-one matching, whereby an ADR firm-quarter observation is uniquely matched to a non-ADR U.S. firm-quarter observation without replacement. The matching procedure is based on the closest propensity scores according to the coefficients estimated in the cross-listing specification

[6] Studies show that more and better corporate disclosure makes it easier for financial analysts to accurately predict firms' economic prospects, which reduces analyst information processing costs (Arping & Sautner, 2013; Healy, Hutton, & Palepu, 1999; Lang & Lundholm, 1996). Examples include the quality of geographic segment disclosure (Botosan & Harris, 2000), management earnings forecasts (Lang & Lundholm, 1996), voluntary non-financial disclosure (Dhaliwal et al., 2012), and political spending disclosure (Goh, Liu, & Tsang, 2020).

[7] Supporting this view, research shows that analysts tend to follow firms with higher-quality disclosure (e.g., Barth, Kasznik, & McNichols, 2001; Botosan & Harris, 2000; Bradshaw, Miller, & Serafeim, 2009; Healy et al., 1999; Lang & Lundholm, 1996; Lobo et al., 2012). For example, analysts prefer to follow firms with more management forecasts because they can ease analysts' work (e.g., Anantharaman & Zhang, 2011; Balakrishnan, Billings, Kelly, & Ljungqvist, 2014; Feng & McVay, 2010). This finding is consistent with models in which managers disclose information to attract analyst following (Arya & Mittendorf, 2007).

[8] Research shows that analysts tend to specialize in a few industries (e.g., Chan & Hameed, 2006; Gilson, Healy, Noe, & Palepu, 2001; Piotroski & Roulstone, 2004) because they can exploit the commonalities of an industry to enjoy economies of scale in information acquisition and production (Clement, 1999).

[9] To identify ADR firms, we use the Bank of New York Mellon's ADR listing (Bradshaw, Bushee, & Miller, 2004; Bronson et al., 2017; Lang, Lins, & Miller, 2003).

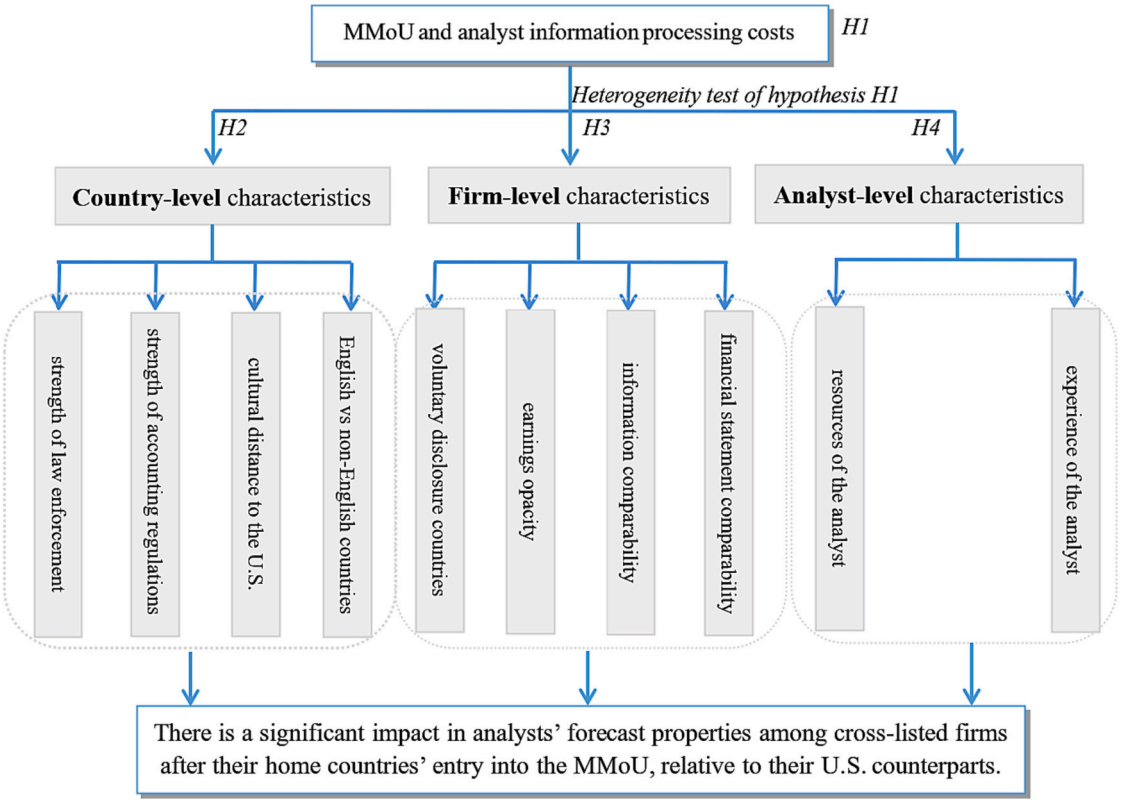

Fig. 1. Analytical thinking logic diagram.
The figure presents our analytical thinking logic. In this study, we propose four research hypotheses, among which hypotheses H2 to H4 are the heterogeneity test of hypothesis H1.

(Appendix B provides the estimation details). After requiring the availability of data on analyst forecasts and control variables at the firm, analyst, and country levels, our final sample consists of 954 ADR firm-quarters and 954 one-to-one matched (without replacement) non-ADR U.S. firm-quarters from 2000 to 2018.[10]

Table 1 tabulates our sample distribution. Panel A reports the sample distribution based on the Fama–French 12 industry classification. Most of the firm-quarters in our sample belong to the "Utilities" industry (22.69%), followed by the "Consumer Non-Durables" (17.09%) and "Business Equipment" (10.95%) industries. The firms belonging to the "Chemicals and Allied Products" industry have the most analyst coverage (*ANALYST_COVERAGE* = 2.659), whereas those belonging to the "Telephone and Television Transmission" industry have the least analyst coverage (*ANALYST_COVERAGE* = 1.262). The "Telephone and Television Transmission" industry firms also have the most analyst forecast errors (*ANALYST_ERROR* = 0.156), whereas the "Manufacturing" industry firms have the fewest (*ANALYST_ERROR* = 0.010). Lastly, the "Chemicals and Allied Products" industry firms demonstrate the highest analyst forecast dispersion (*ANALYST_DISPERSION* = 0.149), whereas the "Other" industry firms demonstrate the lowest (*ANALYST_ DISPERSION* = 0.024).

Panel B of Table 1 reports the sample distribution by year. The fewest observations (43) occur in 2000, and the number increases over time to reach the most observations (150) in 2010. The number of observations (113) then decreases slightly until 2018. Similarly, analyst coverage generally increases from 1.817 in 2000 to 2.028 in 2018. This trend is consistent with that reported by Beaver, McNichols, and Wang (2020). Furthermore, neither analyst forecast error nor analyst dispersion demonstrates any clear temporary changes over time. During the financial crisis period of 2009, we observe the largest value of analyst forecast error (*ANALYST_ERROR* = 0.067) and the second largest value of analyst forecast dispersion (*ANALYST_DISPERSION* = 0.101).

Panel C of Table 1 reports the sample distribution by the home country of the foreign firms cross-listed in the U.S. Our sample consists of 18 foreign countries, most of which joined the MMoU between 2002 and 2018. It is important to note that the Netherlands Antilles had not yet joined the MMoU by the time of this study. Bermuda has the most observations (137), followed by Israel (117) and Canada (92).[11][12] Japan has the fewest observations (1), followed by Denmark (4). The firm-quarters with the largest analyst coverage are in Switzerland (3.104), the greatest analyst forecast error is in Turkey (0.177), and the greatest analyst forecast dispersion is in Singapore (0.113).

3.2. Research design

H1 predicts a reduction of analyst information processing costs for foreign firms cross-listed in the U.S. after their home countries entered the MMoU. To test this hypothesis, we develop and estimate a multivariate regression model following prior studies (Byard et al., 2011; Byard & Shaw, 2003; Dhaliwal et al., 2012; Muslu et al., 2019):

[10] The application of the matching method successfully eliminates the differences of all major control variables across the treatment and control samples.

[11] Bermuda and Israel are low-tax countries which have become compelling legal homes for firms from many countries (Desai, 2009).

[12] Canada joined the MMoU in different years. For example, Ontario and Quebec joined the MMoU in 2002, 2003 while Alberta and British Columbia joined the MMoU in 2003. Our results still hold if we choose the MMoU year as either 2002 or 2003 for observations from Canada. We also find similar results if we exclude observations from Canada in our sample (untabulted for brevity).

Table 1
Sample description.

Panel A: Sample Distribution by Industries

Fama & French 12 industries classification	Obs.	Percent	*ANALYST COVERAGE*	*ANALYST ERROR*	*ANALYST DISPERSION*
1. Consumer Non-Durables	326	17.09	1.735	0.025	0.034
2. Consumer Durables	76	3.98	2.247	0.022	0.043
3. Manufacturing	191	10.01	2.659	0.010	0.065
4. Energy	206	10.80	2.213	0.033	0.047
5. Chemicals and Allied Products	71	3.72	2.655	0.033	0.149
6. Business Equipment	209	10.95	1.976	0.020	0.044
7. Telephone and Television Transmission	82	4.30	1.265	0.156	0.111
8. Utilities	433	22.69	1.832	0.023	0.060
9. Wholesale, Retail, and Some Services	98	5.14	1.811	0.031	0.047
10. Healthcare, Medical Equipment, and Drugs	87	4.56	1.393	0.032	0.049
11. Finance	39	2.04	1.611	0.021	0.123
12. Other	90	4.72	1.787	0.017	0.024
Sum/Avg	***1908***	***100***	***2.024***	***0.030***	***0.066***

Panel B: Sample Distribution by Year

	Year	Obs	Percent (%)	*ANALYST COVERAGE*	*ANALYST ERROR*	*ANALYST DISPERSION*		Year	Obs	Percent (%)	*ANALYST COVERAGE*	*ANALYST ERROR*	*ANALYST DISPERSION*
1	2000	43	2.25	1.817	0.067	0.101	11	2010	150	7.86	2.019	0.037	0.073
2	2001	57	2.99	1.778	0.106	0.077	12	2011	144	7.55	1.966	0.034	0.075
3	2002	63	3.3	1.865	0.093	0.062	13	2012	146	7.65	2.048	0.015	0.063
4	2003	54	2.83	1.956	0.005	0.030	14	2013	133	6.97	2.083	0.035	0.083
5	2004	69	3.62	2.119	0.005	0.037	15	2014	130	6.81	2.082	0.023	0.078
6	2005	60	3.14	2.068	0.003	0.026	16	2015	125	6.55	2.045	0.035	0.095
7	2006	70	3.67	2.121	0.036	0.048	17	2016	111	5.82	2.101	0.023	0.081
8	2007	94	4.93	1.947	0.017	0.066	18	2017	127	6.66	2.021	0.026	0.064
9	2008	104	5.45	2.041	0.056	0.064	19	2018	113	5.92	2.028	0.009	0.057
10	2009	115	6.03	1.817	0.067	0.101	20	***Sum/Avg***	***1908***	***100***	***2.024***	***0.030***	***0.066***

Panel C: Sample Distribution by Foreign Home Countries

Country name		MMoU Year	Obs.	Percent (%)	*ANALYST COVERAGE*	*ANALYST ERROR*	*ANALYST DISPERSION*
Home Countries of ADR Firms (Treatment Group)							
1	Bermuda	2007	137	7.18	2.072	0.019	0.065
2	British Virgin Islands	2007	59	3.09	2.211	0.005	0.021
3	Canada	2002	92	4.82	1.779	0.057	0.096
4	Cayman Islands	2009	57	2.99	1.822	0.001	0.013
5	China	2007	19	1.00	1.767	0.034	0.029
6	Czechia	2007	12	0.63	1.857	0.078	0.091
7	Denmark	2006	4	0.21	1.069	0.007	0.024
8	Hong Kong, China	2003	13	0.68	2.026	0.006	0.043
9	Ireland	2012	64	3.35	2.187	0.001	0.020
10	Israel	2006	117	6.13	1.525	0.095	0.070
11	Japan	2008	1	0.05	0.693	0.086	0.067
12	Netherlands	2007	69	3.62	2.502	0.002	0.074
13	Netherlands Antilles	–	62	3.25	1.590	0.014	0.042
14	Panama	2017	76	3.98	2.691	0.002	0.027
15	Singapore	2005	37	1.94	2.952	0.001	0.113
16	Switzerland	2010	76	3.98	3.104	0.004	0.017
17	Turkey	2002	24	1.26	0.931	0.177	0.086
18	United Kingdom	2003	35	1.83	1.346	0.019	0.032
	Avg		954	50.00	2.073	0.028	0.052
U.S. Domestic Firms (Control Group)							
19	United States	2002	954	50.00	1.974	0.032	0.079
	Sum/Avg		***1908***	***100***	***2.024***	***0.030***	***0.066***

This table tabulates our sample distribution for 1908 firm-quarter observation sample, including 954 ADR firm-quarters and 954 non-ADR US firm-quarters from 2000 to 2018. We rely on a one-to-one matching whereby an ADR firm-quarter is uniquely matched to a non-ADR US firm-quarter in the same industry without replacement. The matching is based on propensity scores from the coefficient estimated from the cross-listing specification in Appendix B. Panels A to C report the number of observations across Fama-12 industries, year, and firms' home countries. We also report the average percentage of firm-years with analyst coverage (*ANALYST_COVERAGE*).

$$\begin{aligned} ANALYST\_COVERAGE_{i,t} \text{ or } ANALYST_{ERROR_{i,t}} \text{or } ANALYST_{DIPSERSION\,i,t} \\ = \alpha_0 + \alpha_1 ADR_{i,t} + \alpha_2 POST_{i,t} + \alpha_3 ADR_{i,t} \times POST_{i,t} + \beta' Firm_{Controls} \\ + \gamma' Analyst_{Controls} + \delta' Country_{Controls} \\ + year, industry, and\ country\ fixed\ effect + \varepsilon \end{aligned} \quad (1)$$

where the three dependent variables capture the analyst information processing costs. *ANALYST_COVERAGE* is the natural logarithm of the number of analysts issuing forecasts in quarter *t*. *ANALYST_ERROR* is the average analyst forecast error in quarter *t*. Analyst forecast error is the absolute difference between the forecasted and actual earnings, scaled by the stock price at the end of the quarter *t*. *ANALYST_DISPERSION* is the dispersion of earnings forecasts in quarter *t*. When the information processing cost is small, analyst coverage would be larger, while forecast error and dispersion would be smaller (De Franco et al., 2011).

ADR equals 1 if a firm is an ADR firm and 0 otherwise. The estimated coefficient on *ADR* thus captures the differences in analyst information processing costs between ADR firm-quarters and non-ADR U.S. firm-quarters pre-MMoU. *POST* equals 1 if a firm-quarter observation is after the year that its home country enters the MMoU and 0 otherwise. For the matched domestic non-ADR U.S. firms, the year of MMoU entry corresponds to that of their matched ADR firm counterparts (i.e., the pseudo-MMoU years). Our variable of interest is the interaction term *ADR* × *POST*, whose coefficient captures the changes in analyst information processing costs in ADR firms relative to their matched domestic U.S. counterparts in the post-MMoU period.[13]

Following prior studies (Botosan & Stanford, 2005; Byard et al., 2011; Byard & Shaw, 2003; Driskill, Kirk, & Tucker, 2020; Horton et al., 2013), we control for a number of characteristics at the firm, analyst, and country levels. At the firm level, we first control for various earnings attributes that may affect analyst information processing costs. We use a firm's absolute abnormal accruals (*ABS_DA*) adjusted for industry and year averages as a measure of earnings opacity (Lobo, Song, & Stanford, 2012). We control for the timely loss disclosure by the *LARGE_NEG*, which equal to 1 when net income scaled by assets is less than −0.2, and 0 otherwise. We control for the likelihood of earnings manipulation by the *SMALL_POS*, which equal to 1 when net income scaled by assets is between 0 and 0.01, and 0 otherwise. We control for the earnings smoothness (*EARN_SMOOTH*) measured by the correlation between cash flows and accruals over the previous five years. These four control variables have been shown to vary significantly before and after the MMoU (Silvers, 2020a) and have been documented to influence the analyst information processing costs (Lobo et al., 2012; Peterson, Schmardebeck, & Wilks, 2015).

We further control for the choice of auditors (*BIGN*) to capture the credibility of financial reports, and the indicator for management forecast issuance (*MF_ISSUE*) to capture the extent of voluntary disclosure that can influence analyst information processing costs. We additionally control for the percentage of foreign institutional investors (*IO_FOREIGN*) and the percentage of institutional ownership (*INSTI_OWNER*) to capture the demand for analyst services.[14] Furthermore, we use the natural logarithm of total assets to capture firm size (*FIRMSIZE*). We measure a firm's information demand from debtholders by its leverage ratio (*LEV*) and profitability by its return on assets (*ROA*). These measures proxy for a firm's general information environment (Atiase, 1985; Hope, 2003). We also control for operational complexity and uncertainty using the number of business and geographic segments (*BUS_SEG* and *GEO_SEG*). When firms become more diversified, forecasting their earnings becomes more complex (Duru & Reeb, 2002). Finally, we control for the standard deviation of daily stock returns in the previous four quarters (*RETURN_VOLATILITY*) to capture a firm's information uncertainty.

At the analyst level, we control for the average number of individual analysts covering the other firms in the same quarter (*ANALYST_BUSY*), as busy analysts are likely to spend less time and resources on each firm (Driskill et al., 2020). We also control for the average brokerage size (*BROKERAGE_SIZE*) because analysts in larger brokerages have more resources (e.g., Clement, 1999; Herrmann & Thomas, 2005). In addition, we control for the average general working experience of individual analysts (*GENERAL_EXP*) to capture the experiences of the analysts (Herrmann & Thomas, 2005; Jacob et al., 1999; Mikhail et al., 1997). Longer prior forecast experience can improve the quality of analysts' current forecasts (Jacob et al., 1999). Thus, we control for the average firm-specific experience of individual analysts covering a given firm (*FIRM_EXP*).

At the country level, we first include per capita GDP (*PCGDP*) to control for the standard of living and development across countries, which is important macroeconomic information to analysts (Hutton et al., 2012). To capture variations in the strength of law enforcement in a country, we include *LEG_ENF*.[15] We further control for the importance of the equity market (*EQUITY*) and the level of disclosure of a country (Choi, Kim, Liu, & Simunic, 2008). The aggregate demand for analyst services is expected to be greater when the equity market is more important in a country.[16] *DIS_REG* is the accounting standards variable from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998), which measures the level of disclosure required in each country. Again, information costs are probably higher for firms from countries with weaker disclosure requirements, thus making it more difficult to forecast cross-listed firms. Finally, we include both year and industry (where industries are classified according to the Fama–French 12 industry classification) fixed effect to control for possible variations in analyst information processing costs across years and industries. All of the continuous variables are winsorized at the 1st and 99th percentiles. Appendix A provides all of the variable definitions.

4. Empirical results

4.1. Descriptive statistics

Table 2 reports the descriptive statistics. The distribution of analyst information processing costs proxies is consistent with that reported in other studies using the same measurement (e.g., Dechow & You, 2012; Sheng & Thevenot, 2012; To, Navone, & Wu, 2018).

4.2. Univariate comparison

In Figs. 2-4, we compare the means of *ANALYST_COVERAGE*,

[13] Since MMoU is signed between countries, aiming for the cross-border information exchange of companies cross-listed in foreign countries, even if the business distribution of American multinational companies involves multiple countries, their information disclosure behavior will not be affected by MMoU in that country when they are not cross-listed in the country or the country does not join the MMoU. Thus, this study uses one time node as the impact time and the results will not be affected.

[14] Lang et al. (2020) find the MMoU leads to significant increases in foreign investment.

[15] Based on La Porta et al. (1998), *LEG_ENF* is calculated as the mean score of three legal variables: (i) the efficiency of the judicial system, (ii) an assessment of the rule of law, and (iii) the corruption index. Information costs are higher for countries with weaker law enforcement, thus making it more difficult to forecast cross-listed firms.

[16] *EQUITY* captures the importance of the equity market, which is measured as the average ranking across the following three variables used by La Porta et al. (1997): (i) the ratio of the total stock market capitalization held by minorities to the gross national product, (ii) the number of listed domestic firms relative to the population, and (iii) the number of initial public offerings relative to the population.

Table 2
Descriptive statistics.

	Obs.	Mean	Std. Dev.	Q1	Median	Q3
Variable of Interests						
ANALYST_COVERAGE	1908	2.024	0.764	1.386	2.079	2.639
ANALYST_ERROR	1908	0.030	0.140	0.001	0.002	0.007
ANALYST_DISPERSION	1908	0.066	0.129	0.014	0.027	0.065
ADR	1908	0.500	0.500	0.000	–	1.000
POST	1908	0.673	0.469	0.000	1.000	1.000
Firm-level Control Variables						
ABS_DA	1908	0.051	0.045	0.019	0.039	0.069
LARGE_NEG	1908	0.015	0.122	0.000	0.000	0.000
SMALL_POS	1908	0.236	0.425	0.000	0.000	0.000
EARN_SMOOTH	1908	−0.599	0.385	−0.872	−0.758	−0.439
BIGN	1908	0.753	0.432	1.000	1.000	1.000
MF_ISSUE	1908	0.377	0.700	0.000	0.000	1.000
IO_FOREIGN	1908	0.068	0.109	0.000	0.021	0.120
INSTI_OWNER	1908	0.335	0.375	0.000	0.135	0.723
FIRMSIZE	1908	7.402	2.104	5.899	7.525	8.856
ROA	1908	0.001	0.053	−0.002	0.010	0.023
LEV	1908	0.478	0.227	0.301	0.488	0.616
BUS_SEG	1908	1.052	0.463	0.693	0.693	1.386
GEO_SEG	1908	1.909	0.404	1.609	1.946	2.079
RETURN_VOLATILITY	1908	0.029	0.014	0.019	0.025	0.035
Analyst-level Control Variables						
ANALYST_BUSY	1908	9.838	5.799	4.400	10.600	13.923
BROKERAGE_SIZE	1908	35.181	20.187	15.700	35.602	50.895
GENERNAL_EXP	1908	9.585	4.102	6.892	9.667	12.231
FIRM_EXP	1908	3.091	2.306	1.103	2.750	4.571
Country-level Control Variables for the 19 Countries						
PCGDP	19	25.029	23.870	2.567	26.284	39.496
EQUITY	19	4.491	2.483	3.000	4.667	6.000
LEG_ENF	19	3.930	1.868	2.333	4.667	4.667
DIS_REG	19	69.053	6.069	65.000	71.000	71.000

This table reports the sample size, mean, percentiles, and standard deviations of our sample variables. Based on the propensity score matching method, the sample includes 954 ADR firm-quarters and 954 non-ADR U.S. firm-quarters with the closest propensity score from 2000 to 2018. The variables at the country level are based on the 19 countries in the sample. All continuous variables are winsorized at the 1st and 99th percentiles. We detail the variable definitions in Appendix A.

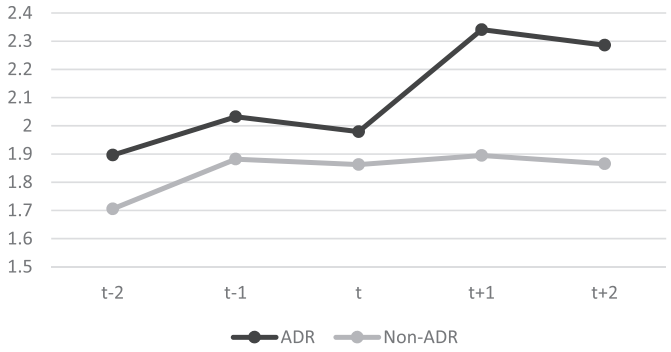

Fig. 2. Average *ANALYST_COVERAGE* Around the MMoU.
These figures present the results comparing the mean of *ANALYST_COVERAGE*, *ANALYST_ERROR*, and *ANALYST_DISPERSION* across the year of MMoU for ADR and the matched non-ADR US sample, respectively. The sample period is *t-2* to $t + 2$ centered on the year of MMoU (*t*).

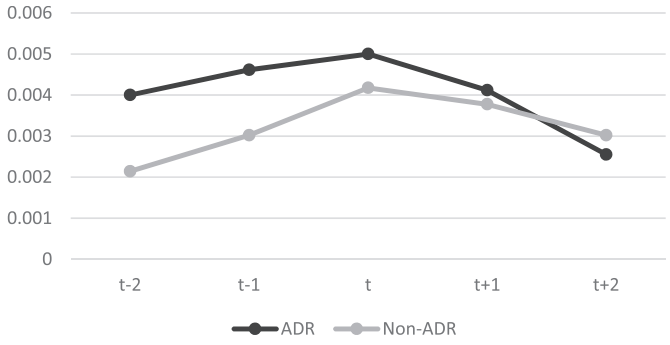

Fig. 3. Average *ANALYST_ERROR* Around the MMoU.
These figures present the results comparing the mean of *ANALYST_COVERAGE*, *ANALYST_ERROR*, and *ANALYST_DISPERSION* across the year of MMoU for ADR and the matched non-ADR US sample, respectively. The sample period is *t-2* to $t + 2$ centered on the year of MMoU (*t*).

ANALYST_ERROR, and *ANALYST_DISPERSION* across the MMoU signing year for cross-listed firms and their matched domestic U.S. counterparts. The sample period is *t*-2 to $t + 2$, centered on the year of the MMoU, *t*. Fig. 2 shows that the average *ANALYST_COVERAGE* of cross-listed firms is generally slightly larger than that of their domestic U.S. counterparts in the pre-MMoU period suggesting a greater level of interest in cross-listed firms from analysts. However, starting from the year of the MMoU, cross-listed firms tend to be followed by more analysts, and the increase becomes larger than that of their domestic U.S. counterparts in the post-MMoU period.

A similar trend is observed in Figs. 3 and 4 as well, in which we compare analyst forecast errors and analyst forecast dispersion across the periods. For example, the figures show that starting from the year of the MMoU, cross-listed firms' analyst forecast error and analyst forecast dispersion decrease. More importantly, the decrease in cross-listed firms' analyst forecast error and dispersion tends to be larger than that of their domestic U.S. counterparts in the post-MMoU period. Untabulated results show that the ADR sample has a significant ($p < 0.1$) change in *ANALYST_COVERAGE*, *ANALYST_ERROR*, and *ANALYST_DISPERSION* from the pre-MMoU period to the post-MMoU period,

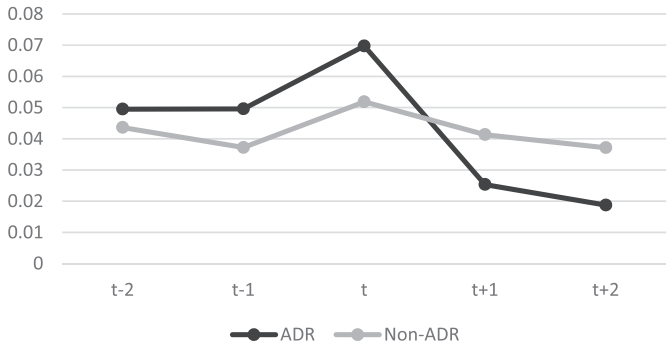

Fig. 4. Average *ANALYST_DISPERSION* Around the MMoU.
These figures present the results comparing the mean of *ANALYST_COVERAGE*, *ANALYST_ERROR*, and *ANALYST_DISPERSION* across the year of MMoU for ADR and the matched non-ADR US sample, respectively. The sample period is *t-2* to *t + 2* centered on the year of MMoU (*t*).

whereas the matched U.S. sample does not.[17]

Observations from these figures also confirm that the parallel trend assumption underlying the DID analysis is met, as we do not find significant differences between cross-listed firms and domestic U.S. firms in terms of their analyst information processing costs before the MMoU. Overall, these univariate results support the prediction that the entry of the MMoU by firms' foreign countries has a significant positive effect on their analyst information processing costs.

4.3. Hypothesis testing: H1

H1 suggests that foreign countries' MMoU entry significantly affects the analyst information costs of foreign firms. Table 3 reports the regression results for Model (1). Columns (1) and (2) present the results when the dependent variable is *ANALYST_COVERAGE*, with and without control variables, respectively. The results support our conjecture that analyst coverage of cross-listed firms increases relative to their U.S. counterparts after the analysts' home countries enter the MMoU. For example, as Column (2) shows, the coefficient on *ADR* × *POST* is 0.139, which is significant at the 1% level. This finding suggests that relative to domestic U.S. firms, foreign cross-listed firms' analyst coverage is approximately 13.9% higher in the post-MMoU period than in the pre-MMoU period.

Similarly, the results in Columns (3) and (4) indicate that the analyst forecast errors of cross-listed firms decrease relative to that of their U.S. counterparts after the analysts' home countries enter the MMoU. Similar findings are presented in Columns (5) and (6) when the analyst forecast dispersion is the dependent variable. For example, relative to domestic U.S. firms, foreign cross-listed firms' analyst forecast error and dispersion is approximately 9.1% and 9.0% lower in the post-MMoU period than in the pre-MMoU period, respectively.[18]

4.4. Hypothesis testing: H2

H2 postulates that cross-listed firms with greater information opacity as a result of weaker country-level institutions tend to exhibit a greater level of reduction in analyst information processing costs after their home countries enter the MMoU. Table 4 reports the results. Panel A shows the results for the country-level information environment as measured by the stringency of legal enforcement.[19] The coefficients on *ADR_LEG_ENF_LOW* × *POST* reported in Panel A of Table 4 are significant and consistent with our main results, whereas the coefficients on *ADR_LEG_ENF_HIGH* × *POST* are generally not significant. We find the differences between these two types of coefficients are statistically significant. Panel B presents similar results, showing that the negative effect of the MMoU on analyst information processing costs is primarily driven by firms from countries with lower levels of disclosure requirement as captured by *ADR_DIS_REG_LOW* × *POST*. These results support our prediction that the effect of MMoU varies according to the information opacity/costs associated with analyst forecasts.

Next, we use country-level cultural distance (*CUL_DIS*, which captures the differences in culture between the home country and the U.S.) and the official language in a country (*ENGLISH* vs. *NON_ENGLISH*) to further examine whether the information opacity/costs of analysts inferred from firms' foreign home countries influences the impact of the MMoU on analyst earnings forecasts. Panels C and D of Table 4 indicate that our finding of a negative effect of the MMoU on analyst information processing costs is more likely to be observed for foreign firms from countries with greater cultural distance from the U.S. and where English is not the official language. Taken together, we find consistent support for H2 when information opacity or the cost associated with analyst forecasts is measured at the country level, our evidence supports H3.

4.5. Hypothesis testing: H3

H3 reveals that cross-listed firms with higher firm-level information opacity tend to exhibit a greater reduction in analysts' information processing costs after their home countries enter the MMoU. Table 5 Panel A shows the results for firm-level information opacity based on firms' voluntary disclosure. *ADR_MF_ISSUE_HIGH(LOW)* is an indicator that equals 1 if *MF_ISSUE* (whether a firm issues an earnings forecast in a year) is 1 (0) and 0 otherwise. The coefficients on *ADR_MF_ISSUE_LOW* × *POST* are significant and consistent with our main results in all three columns, whereas the coefficients on *ADR_MF_ISSUE_HIGH* × *POST* are generally not significant (with significant differences in the coefficients). Panel B presents similar results, showing that the negative effect of the MMoU on analyst information processing costs is primarily driven by firms from countries with lower levels of earnings opacity as captured by *ADR_ABS_DA_HIGH* × *POST*. To further examine whether our main results are stronger when the comparability is lower, we use information comparability (*INFCOMPARE*) and financial statement comparability (*FSCOMPARE*). Panels C and D suggest that our finding of a negative effect of the MMoU on analyst information processing costs is more likely to be observed for firms with lower information comparability and financial statement comparability. Taken together, to the extent that information opacity or the processing cost of financial analysts is greater for cross-listed firms with lower levels of voluntary disclosure, lower earnings quality, and weaker information and financial statement comparability, our evidence supports H3.

[17] Our figures also reveal a decreasing trend in analyst forecast error and analyst forecast dispersion for non-cross-listed firms in the post-MMoU period. We attribute this finding to the potential informational spillover effect of accounting information from cross-listed firms to their matched domestic firms. However, the questions of whether and to what extent, U.S. domestic firms' information processing costs can also be affected by the MMoU are beyond the scope of our study, and thus we leave these questions for possible future investigation.

[18] To addresses the concern that our results reported on Table 3 may be driven by other firm-level features that may change after the MMoU, we further control for the interaction terms between *Post* and all firm-level control variables. Our results remain robust (untabulated).

[19] *ADR_LEG_ENF_HIGH(LOW)* is an indicator that equals 1 if *LEG_ENF* in the foreign home country of an ADR firm is greater (less) than that in the U.S. and 0 otherwise. These variables capture the strength of law enforcement in a foreign country relative to the U.S.

Table 3
Main results for H1: The MMoU and analyst information processing costs.

Dep Var =	*ANALYST_COVERAGE*		*ANALYST_ERROR*		*ANALYST_DISPERSION*	
	(1)	(2)	(3)	(4)	(5)	(6)
	Without Controls	Full Model	Without Controls	Full Model	Without Controls	Full Model
ADR	−0.021	−0.210**	0.054**	0.042*	0.023	0.024
	(0.101)	(0.093)	(0.022)	(0.024)	(0.020)	(0.018)
POST	0.066	0.037	0.001	0.004	0.003	0.010
	(0.057)	(0.040)	(0.012)	(0.013)	(0.011)	(0.011)
ADR* × *POST	**0.170****	**0.139*****	**−0.084*****	**−0.091*****	**−0.082*****	**−0.090*****
	(0.082)	**(0.046)**	**(0.018)**	**(0.035)**	**(0.016)**	**(0.021)**
ABS_DA		−0.161		0.178*		0.196**
		(0.268)		(0.100)		(0.093)
LARGE_NEG		0.385***		−0.006		0.004
		(0.101)		(0.076)		(0.067)
SMALL_POS		−0.109***		0.002		0.005
		(0.033)		(0.007)		(0.008)
EARN_SMOOTH		−0.015		−0.007		0.024*
		(0.047)		(0.014)		(0.013)
BIGN		0.192***		−0.018		−0.007
		(0.043)		(0.012)		(0.010)
MF_ISSUE		0.052***		−0.002		−0.005
		(0.014)		(0.003)		(0.005)
IO_FOREIGN		−0.233*		0.014		0.083**
		(0.120)		(0.067)		(0.039)
INSTI_OWNER		0.025		−0.028***		−0.025**
		(0.052)		(0.009)		(0.012)
FIRMSIZE		0.283***		−0.004		0.005
		(0.009)		(0.003)		(0.004)
ROA		0.529		−0.624***		−0.115
		(0.310)		(0.161)		(0.146)
LEV		−0.367***		0.064**		0.036
		(0.064)		(0.028)		(0.023)
BUS_SEG		−0.007		−0.010		−0.007
		(0.041)		(0.008)		(0.008)
GEO_SEG		−0.018		−0.003		0.006
		(0.045)		(0.007)		(0.008)
RETURN_VOLATILITY		1.245		2.530***		1.123**
		(1.233)		(0.669)		(0.459)
ANALYST_BUSY		0.003		0.001		−0.000
		(0.004)		(0.001)		(0.001)
BROKERAGE_SIZE		−0.001		0.000		0.000
		(0.001)		(0.000)		(0.000)
GENERAL_EXP		−0.001		0.000		0.001
		(0.006)		(0.001)		(0.001)
FIRM_EXP		0.001		0.006**		−0.000
		(0.007)		(0.003)		(0.002)
PCGDP		0.001		−0.000		−0.000
		(0.001)		(0.000)		(0.000)
EQUITY		−1.917***		−0.183*		−0.233***
		(0.420)		(0.098)		(0.081)
LEG_ENF		−1.217***		−0.126**		−0.153***
		(0.263)		(0.064)		(0.054)
DIS_REG		0.755***		0.066*		0.091***
		(0.158)		(0.037)		(0.031)
Constant	1.878***	−39.166***	0.021	−3.349*	0.087***	−4.673***
	(0.124)	(7.969)	(0.027)	(1.881)	(0.024)	(1.548)
Observations	1908	1908	1908	1908	1908	1908
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.319	0.678	0.073	0.202	0.093	0.124

This table presents the results examining the influence of the MMoU on the association between ADR and analyst information processing costs. *ADR* is an indicator variable for ADR firms. *POST* is an indicator equal to one in the year of the MMoU and all years after the MMoU, and zero otherwise. For the matched non-ADR U.S. firms, their years of the MMoU are the corresponding years of the matched ADR firms: i.e., the pseudo MMoU years. See Appendix A for variable definitions. Robust standard errors are clustered at the firm and year levels. The standard errors are reported in parentheses. ***, **, and * indicates p-values of 1%, 5%, and 10%, respectively.

4.6. Hypothesis testing: H4

H4 predicts that analysts with fewer resources and less experience forecasting foreign firms exhibit a greater change in their forecasts after their firms' foreign home countries enter the MMoU. To prove this, we conduct cross-sectional tests based on analyst-level variables. Table 6 reports the results. Panel A shows the results for analysts' resources as measured by *ADR_BROKERAGE_LARGE(SMALL)*, which is an indicator that equals 1 if *BROKERAGE_SIZE* is greater (less) than the sample median and 0 otherwise. The coefficients on *ADR_BROAKGE_SMALL* × *POST* are significant and consistent with our main results in all three columns, whereas the coefficients on *ADR_BROKAGE_LARGE* × *POST* are generally not significant (with significant differences in the coefficients). The results support the prediction that analysts in smaller brokerages

Table 4
Main results for H2: Cross-sectional results at the Country-Level.

Panel A: Relative Strength of Law Enforcement to US (*LEG_ENF*)

Dep Var=	(1) *ANALYST_COVERAGE*		(2) *ANALYST_ERROR*		(3) *ANALYST_DISPERSION*	
ADR_LEG_ENF_LOW	2.673***	(0.521)	0.909***	(0.302)	0.397**	(0.186)
ADR_LEG_ENF_LOW* × *POST [a]	**0.185***	**(0.108)**	**−0.349*****	**(0.114)**	**−0.162*****	**(0.044)**
ADR_LEG_ENF_HIGH	0.212**	(0.101)	0.032	(0.021)	0.021	(0.017)
ADR_LEG_ENF_HIGH* × *POST [b]	**0.127***	**(0.070)**	**−0.025**	**(0.021)**	**−0.071*****	**(0.020)**
POST	0.036	(0.048)	0.001	(0.013)	0.010	(0.011)
Controls, Industry & Year FE	Yes		Yes		Yes	
Coef Diff: *a-b*	$P > 0.1$		$P < 0.01$		P < 0.01	
Adjusted R^2	0.679		0.237		0.126	

Panel B: Relative Strength of Accounting Regulations (*DIS_REG*)

Dep Var=	(1) *ANALYST_COVERAGE*		(2) *ANALYST_ERROR*		(3) *ANALYST_DISPERSION*	
ADR_DIS_REG_LOW	0.361*	(0.198)	0.462	(0.299)	0.023	(0.018)
ADR_DIS_REG_LOW* × *POST [a]	**0.537*****	**(0.086)**	**−0.393*****	**(0.096)**	**−0.091*****	**(0.021)**
ADR_DIS_REG_HIGH	−0.214**	(0.093)	0.044*	(0.024)	0.059	(0.058)
ADR_DIS_REG_HIGH* × *POST [b]	**0.156*****	**(0.051)**	**−0.083****	**(0.034)**	**−0.027**	**(0.042)**
POST	0.040	(0.040)	0.003	(0.013)	0.011	(0.011)
Controls, Industry & Year FE	Yes		Yes		Yes	
Coef Diff: *a-b*	$P < 0.01$		P < 0.01		P < 0.01	
Adjusted R^2	0.679		0.207		0.123	

Panel C: Relative Cultural Distance (*CUL_DIS*)

Dep Var=	(1) *ANALYST_COVERAGE*		(2) *ANALYST_ERROR*		(3) *ANALYST_DISPERSION*	
ADR_CUL_DIS_HIGH	0.213**	(0.093)	0.041*	(0.024)	0.023	(0.018)
ADR_CUL_DIS_HIGH* × *POST [a]	**0.173*****	**(0.050)**	**−0.094*****	**(0.037)**	**−0.099*****	**(0.022)**
ADR_CUL_DIS_LOW	−0.030	(0.082)	0.024	(0.019)	−0.010	(0.016)
ADR_CUL_DIS_LOW* × *POST [b]	**−0.124**	**(0.086)**	**−0.062**	**(0.091)**	**−0.017**	**(0.014)**
POST	0.037	(0.040)	0.004	(0.013)	0.010	(0.011)
Controls, Industry & Year FE	Yes		Yes		Yes	
Coef Diff: *a-b*	P < 0.01		$P > 0.10$		$P < 0.01$	
Adjusted R^2	0.678		0.202		0.125	

Panel D: English vs Non-English Countries

Dep Var=	(1) *ANALYST_COVERAGE*		(2) *ANALYST_ERROR*		(3) *ANALYST_DISPERSION*	
ADR_NON_ENGLISH	0.213**	(0.093)	0.041*	(0.024)	0.023	(0.018)
ADR_NON_ENGLISH* × *POST [a]	**0.165*****	**(0.051)**	**−0.098*****	**(0.037)**	**−0.093*****	**(0.022)**
ADR_ENGLISH	−0.741***	(0.172)	0.111**	(0.053)	0.083*	(0.046)
ADR_ENGLISH* × *POST [b]	**−0.159**	**(0.105)**	**−0.013**	**(0.022)**	**−0.049*****	**(0.018)**
POST	−0.213**	(0.093)	0.041*	(0.024)	0.023	(0.018)
Controls, Industry & Year FE	Yes		Yes		Yes	
Coef Diff: *a-b*	P < 0.01		P < 0.01		$P < 0.05$	
Adjusted R^2	0.678		0.203		0.124	

This table shows the estimates examining whether our main results are moderated by the following factors at the country-level based on the ADR home countries: i.e., the strength of law enforcement (panel A), and the strength of accounting regulations (panel B), the cultural distance to the U.S. (panel C), and the English vs non-English officially speaking countries (panel D). See Appendix A for variable definitions. Robust standard errors are clustered at the firm and year levels. The standard errors are reported in parentheses. ***, **, and * indicates p-values of 1%, 5%, and 10%, respectively.

exhibit a greater level of reduction in their information processing costs in the post-MMoU period. Similarly, Panel B shows that the positive effect of the MMoU on analyst forecasts is primarily driven by analysts with less forecast experience, as measured by *ADR_GENERAL_EXP_LOW*. To further examine whether our results are stronger for lower levels of analyst experience, we then use indicators of analysts' experience following international firms (*ADR_GLOBAL_EXP*) and analysts' experience following cross-listed firms (*ADR_FOREIGN_EXP*). Across all these tests, H4 is supported.

5. Additional analyses and robustness checks

5.1. Dynamic DID analysis

Following Bertrand and Mullainathan (2003), we conduct a dynamic DID analysis. To better identify the period in which the effect of the MMoU on analyst information processing costs is likely to be observed, we replace the *POST* indicator in our model with a set of indicator variables (*PRIOR_YEAR2*, *PRIOR_YEAR1*, *YEAR0*, *POST_YEAR1*, and

Table 5
Main results for H3: Cross-sectional results at the firm-level.

Panel A: Voluntary Disclosure (*MF_ISSUE*)

Dep Var=	(1) *ANALYST_COVERAGE*		(2) *ANALYST_ERROR*		(3) *ANALYST_DISPERSION*	
ADR_MF_ISSUE_LOW	−0.154	(0.104)	0.049**	(0.024)	0.034*	(0.019)
ADR_MF_ISSUE_LOW* × *POST [a]	**0.257*****	**(0.067)**	**−0.117*****	**(0.039)**	**−0.104*****	**(0.026)**
ADR_MF_ISSUE_HIGH	−0.244**	(0.091)	0.034	(0.027)	0.004	(0.020)
ADR_MF_ISSUE_HIGH* × *POST [b]	**0.073**	**(0.055)**	**−0.044**	**(0.028)**	**−0.064*****	**(0.017)**
POST	0.044	(0.040)	0.002	(0.013)	0.009	(0.011)
Controls, Industry & Year FE	Yes		Yes		Yes	
Coef Diff: *a-b*	P < 0.01		*P* < 0.01		P < 0.05	
Adjusted R^2	0.688		0.207		0.124	

Panel B: Earnings Opacity (*ABS_DA*)

Dep Var=	(1) *ANALYST_COVERAGE*		(2) *ANALYST_ERROR*		(3) *ANALYST_DISPERSION*	
ADR_ABS_DA_HIGH	−0.212**	(0.093)	0.042*	(0.024)	0.024	(0.018)
ADR_ABS_DA_HIGH* × *POST [a]	**0.169*****	**(0.046)**	**−0.096*****	**(0.037)**	**−0.097*****	**(0.022)**
ADR_ABS_DA_LOW	−0.194*	(0.104)	0.032	(0.023)	0.013	(0.019)
ADR_ABS_DA_LOW* × *POST [b]	**0.083**	**(0.054)**	**−0.076*****	**(0.029)**	**−0.051*****	**(0.016)**
POST	0.040	(0.041)	0.004	(0.013)	0.011	(0.011)
Controls, Industry & Year FE	Yes		Yes		Yes	
Coef Diff: *a-b*	*P* < 0.10		P > 0.10		P < 0.10	
Adjusted R^2	0.678		0.202		0.124	

Panel C: Information Comparability to the Matched Non-ADR U.S. Firms

Dep Var=	(1) *ANALYST_COVERAGE*		(2) *ANALYST_ERROR*		(3) *ANALYST_DISPERSION*	
ADR_INFCOMPARE_LOW	−0.076	(0.087)	−0.016	(0.036)	0.075**	(0.031)
ADR_INFCOMPARE_LOW* × *POST [a]	**0.162****	**(0.071)**	**−0.051****	**(0.026)**	**−0.088*****	**(0.031)**
ADR_INFCOMPARE_HIGH	−0.035	(0.101)	−0.026	(0.047)	0.031	(0.024)
ADR_INFCOMPARE_HIGH* × *POST [b]	**−0.091**	**(0.078)**	**−0.044**	**(0.028)**	**−0.035****	**(0.015)**
POST	0.018	(0.039)	−0.013	(0.014)	−0.003	(0.011)
Controls, Industry & Year FE	Yes		Yes		Yes	
Coef Diff: *a-b*	P < 0.01		P > 0.10		P < 0.01	
Adjusted R^2	0.679		0.198		0.114	

Panel D: Financial Statement Comparability to Industry Peers

Dep Var=	(1) *ANALYST_COVERAGE*		(2) *ANALYST_ERROR*		(3) *ANALYST_DISPERSION*	
ADR_FSCOMPARE_LOW	0.032	(0.134)	0.049*	(0.026)	0.023	(0.018)
ADR_FSCOMPARE_LOW* × *POST [a]	**0.253*****	**(0.049)**	**−0.118*****	**(0.031)**	**−0.122*****	**(0.030)**
ADR_FSCOMPARE_HIGH	−0.220**	(0.088)	−0.069	(0.061)	−0.008	(0.032)
ADR_FSCOMPARE_HIGH* × *POST [b]	**0.023**	**(0.069)**	**−0.051****	**(0.025)**	**−0.066*****	**(0.020)**
POST	0.041	(0.037)	−0.001	(0.012)	0.013	(0.010)
Controls, Industry & Year FE	Yes		Yes		Yes	
Coef Diff: *a-b*	P < 0.01		P < 0.10		P < 0.05	
Adjusted R^2	0.668		0.204		0.108	

This table shows the estimates examining whether our main results are moderated by the following factors at the firm-level: i.e., the voluntary disclosure (panel A), the earnings opacity (panel B), information comparability (panel C), and financial statement comparability (panel D). See Appendix A for variable definitions. Robust standard errors are clustered at the firm and year levels. The standard errors are reported in parentheses. ***, **, and * indicates p-values of 1%, 5%, and 10%, respectively.

POST_YEAR2). As Table 7 shows, foreign firms and their domestic U.S. counterparts demonstrate no significant differences across all proxies of analyst information processing costs before the year in which a home country enters the MMoU. In other words, we find no significant results for *ADR* × *PRIOR_YEAR2*, *ADR* × *PRIOR_YEAR1*, or *ADR* × *YEAR0*. However, in line with our main results, we find the coefficients on both *ADR* × *POST_YEAR1* and *ADR* × *POST_YEAR2* to be significant regardless of the dependent variable examined. The results of this dynamic DID analysis increase our confidence that the parallel trend assumption, the key assumption of DID analysis, is satisfied.

5.2. Alternative samples and controls

In our sample, many firms' foreign countries entered the MMoU during the early part of the sample period. To address the concern that other unknown but correlated events during the later period of the sample may drive our results, we follow Fauver, Hung, Li, and Taboada (2017) and adopt a shorter but more balanced window. Table 8 presents

Table 6
Main Results for H4: Cross-Sectional Results at the Analyst-Level.

Panel A: Brokerage Size (*BROKERAGE_SIZE*)

Dep Var=	(1) *ANALYST_COVERAGE*		(2) *ANALYST_ERROR*		(3) *ANALYST_DISPERSION*	
ADR_BROKERAGE_SMALL	−0.276**	(0.099)	0.085**	(0.040)	0.061**	(0.024)
ADR_BROKERAGE_SMALL* × *POST [a]	**0.173****	**(0.065)**	**−0.107*****	**(0.038)**	**−0.105*****	**(0.025)**
ADR_BROKERAGE_LARGE	−0.086	(0.099)	0.025	(0.021)	0.010	(0.018)
ADR_BROKERAGE_LARGE* × *POST [b]	**0.057**	**(0.040)**	**−0.057***	**(0.032)**	**−0.059*****	**(0.016)**
POST	0.039	(0.040)	0.085**	(0.040)	0.061**	(0.024)
Controls, Industry & Year FE	Yes		Yes		Yes	
Coef Diff: *a-b*	P < 0.05		P < 0.10		P < 0.01	
Adjusted R^2	0.685		0.205		0.126	

Panel B: Analyst General Experience (*GENERAL_EXP*)

Dep Var=	(1) *ANALYST_COVERAGE*		(2) *ANALYST_ERROR*		(3) *ANALYST_DISPERSION*	
ADR_GENERAL_EXP_LOW	−1.139***	(0.112)	0.206	(0.216)	0.021	(0.018)
ADR_GENERAL_EXP_LOW* × *POST [a]	**0.271*****	**(0.073)**	**−0.130*****	**(0.039)**	**−0.092*****	**(0.021)**
ADR_GENERAL_EXP_HIGH	−0.251**	(0.093)	0.038*	(0.023)	−0.042	(0.037)
ADR_GENERAL_EXP_HIGH* × *POST [b]	**0.016**	**(0.048)**	**−0.075***	**(0.034)**	**−0.055***	**(0.033)**
POST	0.063	(0.040)	0.006	(0.013)	0.012	(0.011)
Controls, Industry & Year FE	Yes		Yes		Yes	
Coef Diff: *a-b*	P < 0.01		P < 0.10		P > 0.10	
Adjusted R^2	0.685		0.206		0.124	

Panel C: Analysts' Experience of Following International Firms

Dep Var=	(1) *ANALYST_COVERAGE*		(2) *ANALYST_ERROR*		(3) *ANALYST_DISPERSION*	
ADR_GLOBAL_EXP_LOW	−0.165	(0.103)	0.055**	(0.025)	0.034*	(0.018)
ADR_GLOBAL_EXP_LOW* × *POST [a]	**0.355*****	**(0.072)**	**−0.097****	**(0.042)**	**−0.100*****	**(0.025)**
ADR_GLOBAL_EXP_HIGH	−0.316**	(0.118)	0.010	(0.023)	0.001	(0.019)
ADR_GLOBAL_EXP_HIGH* × *POST [b]	**0.068**	**(0.060)**	**−0.062****	**(0.028)**	**−0.065*****	**(0.019)**
POST	0.028	(0.042)	−0.000	(0.013)	0.007	(0.011)
Controls, Industry & Year FE	Yes		Yes		Yes	
Coef Diff: *a-b*	P < 0.01		P > 0.10		P < 0.10	
Adjusted R^2	0.681		0.205		0.124	

Panel D: Analysts' Experience of Following Foreign Cross-listed Firms

Dep Var=	(1) *ANALYST_COVERAGE*		(2) *ANALYST_ERROR*		(3) *ANALYST_DISPERSION*	
ADR_FOREIGN_EXP_LOW	−0.142**	(0.069)	0.024*	(0.011)	0.023*	(0.015)
ADR_FOREIGN_EXP_LOW* × *POST [a]	**0.200****	**(0.068)**	**−0.079****	**(0.040)**	**−0.061*****	**(0.021)**
ADR_FOREIGN_EXP_HIGH	−0.174**	(0.074)	0.008	(0.008)	0.013	(0.010)
ADR_FOREIGN_EXP_HIGH* × *POST [b]	**0.044**	**(0.053)**	**−0.037**	**(0.029)**	**−0.030*****	**(0.015)**
POST	0.014	(0.045)	0.001	(0.002)	0.004	(0.005)
Controls, Industry & Year FE	Yes		Yes		Yes	
Coef Diff: *a-b*	P < 0.01		P < 0.05		P < 0.10	
Pseudo/Adjusted R^2	0.678		0.205		0.123	

This table shows the estimates examining whether our main results are moderated by the following factors at the analyst-level: i.e., the brokerage size (panel A), the analyst general experience (panel B), the analysts' experiences of following international firms (panel C), and experiences of following ADR firms (panel D). See Appendix A for variable definitions. Robust standard errors are clustered at the firm and year levels. The standard errors are reported in parentheses. ***, **, and * indicates *p*-values of 1%, 5%, and 10%, respectively.

the results of re-estimating Model (1) using the sample containing only 5 years pre- and post-MMoU entry (Panel A), using the sample containing only 2 years pre- and post-MMoU entry (Panel B), and requiring firms to be in both the pre- and post-MMoU 2-year periods (Panel C). The coefficients on *ADR* × *POST* are all positive and significant when the dependent variable is *ANALYSTS_COVERAGE*, as shown in Column (1). The coefficients on *ADR* × *POST* are all negative and significant when the dependent variables are *ANALYSTS_ERROR* and *ANALYST_DISPERSION*, as shown in Columns (2) and (3), respectively. These results are consistent with our main findings.[20]

We further address the concern that other global events observed

[20] Untabulated results show that only ADR firms from nine and five foreign countries are involved in Panels A and B, respectively. Many countries have joined the MMoU since 2002. Thus, to increase the generalizability of our results, we base our tests on the large sample from 2000 to 2018, which covers 19 countries.

Table 7
Dynamic Difference-in-Differences Analysis.

Dep Var =	(1) *ANALYSTS_COVERAGE*		(2) *ANALYSTS_ERROR*		(3) *ANALYSTS_DISPERSION*	
ADR* × *PRIOR_YEAR2	−0.125	(0.094)	0.024	(0.024)	−0.006	(0.024)
ADR* × *PRIOR_YEAR1	−0.042	(0.116)	−0.018	(0.047)	0.014	(0.042)
ADR* × *YEAR0	−0.051	(0.114)	−0.011	(0.050)	−0.047	(0.045)
ADR* × *POST_YEAR1	**0.230****	**(0.092)**	**−0.080*****	**(0.028)**	**−0.062****	**(0.025)**
ADR* × *POST_YEAR2	**0.163****	**(0.060)**	**−0.053***	**(0.030)**	**−0.052***	**(0.023)**
ADR	−0.222**	(0.095)	0.176***	(0.059)	0.140***	(0.032)
PRIOR_YEAR2	0.107*	(0.055)	−0.027	(0.018)	0.008	(0.015)
PRIOR_YEAR1	0.000	(0.084)	0.019	(0.033)	−0.001	(0.023)
YEAR0	0.043	(0.050)	−0.012	(0.032)	0.005	(0.023)
POST_YEAR1	−0.141**	(0.059)	0.014	(0.013)	0.018	(0.013)
POST_YEAR2	−0.032	(0.050)	0.020	(0.021)	−0.011	(0.014)
Observations	1908		1908		1908	
Controls	Yes		Yes		Yes	
Industry FE	Yes		Yes		Yes	
Year FE	Yes		Yes		Yes	
Adjusted R^2	0.688		0.207		0.126	

This table shows the result of dynamic models. In particular, we follow Bertrand and Mullainathan (2003) and replace the *POST* indicator with indicator variables that track the effect of the MMoU before and after they become effective. These indicator variables are *PRIOR_YEAR2*, *PRIOR_YEAR1*, *YEAR0*, *POST_YEAR1*, and *POST_YEAR2*, which equals one for the year in which the MMoU becomes effective from the prior at least two years to the post at least two years, and zero otherwise. See Appendix A for other variable definitions. Robust standard errors are clustered at the firm and year levels. The standard errors are reported in parentheses. ***, **, and * indicates *p*-values of 1%, 5%, and 10%, respectively.

during our sample period may also affect analyst information processing costs. First, Christensen, Lei, Shu, and Thomas (2020) find that managers issue more accurate forecasts following PCAOB inspection access because the PCAOB improves not only the information contained in external financial reports but also the internal information used by management. As better voluntary disclosure reduces analyst information processing costs, we control for PCAOB inspection events when examining the effect of the MMoU on analyst information processing costs. Second, mandatory IFRS adoption in many countries around the world alters analyst information processing costs (Byard et al., 2011; Horton et al., 2013). Thus, we further control for IFRS adoption events. Finally, we account for the world-wide implementation of board reforms in foreign countries (Fauver et al., 2017). Board reforms are likely to reduce earnings management and reduce analyst information processing costs (Chen, Cheng, & Wang, 2015).[21] We find that the coefficients on *ADR* × *POST* remain significant and consistent with our main results (Panel D), suggesting that they remain robust after controlling for the potential effects of IFRS adoption, PCAOB inspection, and board reform on analyst information processing costs.[22]

5.3. Alternative measures of information processing costs

To check the robustness of our results, we use five alternative measures of analyst information costs, including the average analyst forecast frequency (*AF_FREQ*), the average number of analyst forecast items (*AF_ITEM*), the absolute difference between analysts' forecast consensus and midpoints of management guidance (*AF_HERD*), the analysts' number of questions in the conference calls (*QUE_NUM*), and the analysts' word length of questions in the conference calls (*QUE_LENG*) in investigating the potential effect of the MMoU on analyst information environment. This is because prior studies suggest that when analyst information costs are larger, analysts' forecast frequency is lower with fewer forecasted items, and are more likely to herd with management guidance (Chen, Chris, et al., 2022; Chen, Ma, et al., 2022; Keskek, Tse, & Tucker, 2014). Prior studies also suggest that when analysts need to spend more effort on information collection, they tend to ask more and longer questions in the earnings conference calls (Mayew, Sharp, & Venkatachalam, 2013). Thus, to the extent that the MMoU decreases analyst information costs, *AF_FREQ* and *AF_ITEM* are likely to increase while *AF_HERD*, *QUE_NUM*, and *QUE_LENG* are likely to decrease after the MMoU. Consistent with our prediction, the results in Table 9 exhibit strong support for *AF_FREQ*, *AF_ITEM*, *QUE_NUM*, and *QUE_LENG*. Thus, it provides further evidence that the analyst information costs indeed decrease after the MMoU.

5.4. Does the MMoU increase information and financial statement comparability?

In this section, we directly examine the potential channel through which the MMoU may influence analyst forecasts. Providing more comparable financial statements/information influences analyst information processing costs, presumably by reducing the costs of gathering and processing firm-specific information by analysts (Choi et al., 2019; De Franco et al., 2011). Therefore, we predict lower information processing costs from more comparable financial statements to result in more analysts covering the firm. In addition, more comparable financial statements should facilitate analysts' ability to forecast firms' earnings (i.e., lead to lower analyst forecast error, and less analyst forecast dispersion), by allowing analysts to better use information from comparable firms as additional input in their earnings forecasts.

As discussed, if indeed firms are more inclined to commit to better disclosure quality and thereby provide more comparable financial statements to mitigate concerns when faced with regulatory enforcement or scrutiny (Brown et al., 2019; Christensen, 2016; Kong et al., 2017; Matsumura et al., 2014), it may contribute to our finding of a negative effect of the MMoU on the analyst information processing costs. Table 10 reports the results of this investigation. The coefficients on *ADR* × *POST* are positive and significant in all columns. This finding supports

[21] In Panel D, the indicator variable *POST_IFRS* equals 1 for all observations of ADR firms after the date of mandatory IFRS adoption and 0 otherwise. The indicator variable *POST_PCAOB* equals 1 for all observations of ADR firms after the date of PCAOB inspection and 0 otherwise. The indicator variable *POST_REFORM* equals 1 for all observations of ADR firms after the date of board reform and 0 otherwise.

[22] Untabulated results show that our results remain consistent when replacing the PSM method with the size-match method used to obtain matched U.S. firms for the control group.

Table 8
Alternative Samples and Controls.

Panel A: Firm Years [−5, +5]						
Dep Var =	(1) *ANALYSTS_COVERAGE*		(2) *ANALYSTS_ERROR*		(3) *ANALYSTS_DISPERSION*	
ADR	−0.324***	(0.072)	0.098**	(0.041)	0.092**	(0.037)
POST	0.120**	(0.045)	0.015	(0.014)	0.025**	(0.012)
ADR* × *POST	**0.181*** **	**(0.047)**	**−0.108*** **	**(0.039)**	**−0.108*** **	**(0.026)**
Controls	Yes		Yes		Yes	
Observations	1054		1054		1054	
All FE	Yes		Yes		Yes	
Adjusted R^2	0.654		0.245		0.147	

Panel B: Firm Years [−2, +2]						
Dep Var =	(1) *ANALYSTS_COVERAGE*		(2) *ANALYSTS_ERROR*		(3) *ANALYSTS_DISPERSION*	
ADR	−0.355***	(0.091)	0.101*	(0.057)	0.165***	(0.048)
POST	0.103**	(0.042)	0.005	(0.013)	0.020	(0.013)
ADR* × *POST	**0.121***	**(0.068)**	**−0.076** **	**(0.038)**	**−0.075*** **	**(0.026)**
Controls	Yes		Yes		Yes	
Observations	745		745		745	
All FE	Yes		Yes		Yes	
Adjusted R^2	0.656		0.370		0.204	

Panel C: Requiring Firms to be in Both the Pre- and the Post-MMoU Periods						
Dep Var =	(1) *ANALYSTS_COVERAGE*		(2) *ANALYSTS_ERROR*		(3) *ANALYSTS_DISPERSION*	
ADR	−0.796	(1.321)	3.671***	(0.414)	1.209**	(0.518)
POST	0.142	(0.228)	0.127*	(0.072)	−0.118	(0.095)
ADR* × *POST	**0.793** **	**(0.367)**	**−0.669*** **	**(0.092)**	**−0.232*** **	**(0.088)**
Controls	Yes		Yes		Yes	
Observations	242		242		242	
All FE	Yes		Yes		Yes	
Adjusted R^2	0.731		0.675		0.343	

Panel D: Controlling for Alternative Explanations						
Dep Var=	(1) *ANALYST_COVERAGE*		(2) *ANALYST_ERROR*		(3) *ANALYST_DISPERSION*	
ADR	−0.218**	(0.093)	0.039*	(0.023)	0.024	(0.018)
POST	0.032	(0.042)	0.002	(0.013)	0.009	(0.011)
ADR* × *POST	**0.108** **	**(0.049)**	**−0.082** **	**(0.034)**	**−0.084*** **	**(0.020)**
POST_IFRS	0.547***	(0.077)	−0.011	(0.026)	−0.051*	(0.030)
POST_PCAOB	0.114	(0.070)	−0.070***	(0.024)	−0.005	(0.014)
POST_REFORM	0.199***	(0.056)	−0.039	(0.054)	−0.069	(0.060)
Controls	Yes		Yes		Yes	
Observations	1908		1908		1908	
All FE	Yes		Yes		Yes	
Adjusted R^2	0.683		0.208		0.126	

This table presents results from our main models using a short-window sample from five years prior to the MMoU to the five years after the MMoU (Panel A), two years before and after the MMoU (Panel B), requiring firms to be in both the pre- and the post-MMoU period (Panel C), and controlling for possible alternative explanations: i.e., IFRS adoption, PCAOB inspection and board reform (Panel D). The dependent variables are *ANALYSTS_COVERAGE, ANALYSTS_ERROR*, and *ANALYSTS_DISPERSION*, respectively. See Appendix A for variable definitions. Robust standard errors are clustered at the firm and year levels. The standard errors are reported in parentheses. ***, **, and * indicates *p*-values of 1%, 5%, and 10%, respectively.

our conjecture that the effect of the MMoU on analyst forecasts observed is probably attributable, at least partially, to the change in information and financial statement comparability of cross-listed firms in the post-MMoU period.[23]

5.5. Does the effect of the MMoU differ across ADR levels?

Finally, in an additional test, we further examine whether the MMoU has less influence on Level I ADR firms than on Levels II and III ADR firms because of the greater SEC enforcement for Levels II and III. The SEC considers over-the-counter (OTC) cross-listings to be Level I ADR firms and exchange-listed foreign firms to be Level II and III ADR firms. The Level I ADR program is the easiest way for foreign companies to access U.S. capital markets. Level I ADR firms need not comply with the U.S. GAAP or fully comply with SEC disclosure requirements. However,

[23] We measure information comparability (*INFCOMPARE*) following the method suggested by Yip and Young (2012) and financial statement comparability following the method introduced by De Franco et al. (2011).

Table 9
Alternative Input Measure of Information Costs.

	(1)	(2)	(3)	(4)	(5)
Dep Var =	*AF_FREQ*	*AF_ITEMS*	*AF_HERD*	*QUE_NUM*	*QUE_LENG*
ADR* × *POST	**0.241****	**0.721*****	**0.029**	**−0.115***	**−0.085****
	(0.119)	**(0.203)**	**(0.021)**	**(0.059)**	**(0.037)**
Observations	1908	1908	408	646	646
Controls	Yes	Yes	Yes	Yes	Yes
Industry and Year FE	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.242	0.319	0.103	0.165	0.179

This table presents the results examining the effect of the MMoU on analysts' information processing costs using alternative input measures: i.e., average analyst forecast frequency (*AF_FREQ*), average number of analyst forecast items (*AF_ITEM*), absolute difference between analysts' forecast consensus and midpoints of management guidance (*AF_HERD*), analysts' number of questions in the conference calls (*QUE_NUM*), and analysts' word length of questions in the conference calls (*QUE_LENG*) in investigating the potential effect of the MMoU on analyst information environment. See Appendix A for variable definitions. Robust standard errors are clustered at the firm and year levels. The standard errors are reported in parentheses. ***, **, and * indicates p-values of 1%, 5%, and 10%, respectively.

Table 10
The Impact of the MMoU on Information and Financial Statement Comparability.

Dep Var =	*INFCOMPARE*		*FSCOMPARE*	
	(1)	(2)	(3)	(4)
	Without Controls	With Controls	Without Controls	With Controls
ADR* × *POST	**0.046****	**0.039****	**0.681*****	**0.367****
	(0.018)	**(0.017)**	**(0.257)**	**(0.179)**
Observations	1538	1538	980	980
Controls	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Adjusted R^2	0.440	0.497	0.086	0.289

This table presents results examining the impact of the MMoU on the information and financial statement comparability. *INFCOMPARE* and *FSCOMPARE* are the measures of information and financial statement comparability, respectively. See Appendix A for variable definitions. Robust standard errors are clustered at the firm and year levels. The standard errors are reported in parentheses. ***, **, and * indicates p-values of 1%, 5%, and 10%, respectively.

Level II and III ADR firms are formally listed on the Nasdaq or the American or New York stock exchanges. These foreign firms must fully comply with the U.S. GAAP, such as by providing comprehensive segmental information (Amir, Harris, & Venuti, 1993). We repeat our main analysis by separately examining Level I ADR firms (and their matched US firms) and Level II&III ADR firms (and their matched US firms). The results in Table 11 support our prediction that our results are more pronounced for Levels II and III ADR firms than for Level I ADR firms. This finding lends support to the importance of the MMoU in facilitating cross-border enforcement between securities regulators and its effect on cross-listed firms.

6. Conclusions

According to the IOSCO, the MMoU serves as a platform to enhance cross-border regulatory enforcement capabilities by promoting cooperation among participating securities regulators from various countries worldwide. Since the inception of the MMoU in 2002, the entry of numerous foreign countries has led to a substantial increase in requests for information sharing and exchange across different jurisdictions. Given that the MMoU heightens foreign firms' concerns regarding regulatory enforcement and scrutiny, which subsequently incentivizes them to alleviate such concerns (e.g., by providing more comparable financial statements), we posit that the MMoU contributes to a reduction in the analyst information processing costs of foreign firms cross-listed in the U.S.

Consistent with our prediction, we find an increase in analyst coverage, a decrease in analyst forecast error, and a reduction in analyst forecast dispersion among cross-listed firms after their home countries entered into the MMoU, relative to their U.S. counterparts. We further find the effect of the MMoU on analyst forecasts to vary cross-sectionally with country-, firm-, and analyst-level variables that are correlated with the information costs associated with financial analyst earnings forecasts accuracy. Taken together, our results suggest that improved cross-border information exchange and regulatory cooperation after foreign countries' MMoU entry can have a significant effect on investors' information processing costs. As foreign firms cross-listed in the U.S. are more likely to prioritize better disclosure quality and provide more comparable financial statements to address concerns related to regulatory enforcement or scrutiny (Brown et al., 2019; Christensen, 2016; Kong et al., 2017; Matsumura et al., 2014), these actions contribute to the reduction of analyst information processing costs.

Our study contributes to the existing literature by investigating the impact of the MMoU on the properties of financial analysts' forecasts. In doing so, we extend the growing body of research that explores the implications of cross-border regulatory cooperation and information exchange in the capital market. Importantly, our findings reveal that such cross-border regulatory cooperation has a significant and positive effect on the capital market by reducing information asymmetry between investors and cross-listed firms. By shedding light on the benefits of the MMoU, our study underscores the importance of international regulatory collaboration in fostering transparency and enhancing the

Table 11
Does the Effect of the MMoU Differ across ADR Levels.

Dep Var =	*ANALYST_COVERAGE*		*ANALYST_ERROR*		*ANALYST_DISPERSION*	
	(1)	(2)	(3)	(4)	(5)	(6)
	Level I ADR firms	Levels II and III ADR firms	Level I ADR firms	Levels II and III ADR firms	Level I ADR firms	Levels II and III ADR firms
ADR* × *POST	**0.015****	**0.184*****	**−0.024***	**−0.127*****	**−0.013***	**−0.136****
	(0.006)	**(0.066)**	**(0.011)**	**(0.048)**	**(0.006)**	**(0.059)**
Observations	486	1422	486	1422	486	1422
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.152	0.269	0.031	0.179	0.068	0.163

In this table, we examine whether the MMoU has less influence on Level I ADR firms than on Levels II and III ADR firms because of the greater SEC enforcement for Levels II and III. We repeat our main analysis by separately examining Level I ADR firms (and their matched US firms) and Level II&III ADR firms (and their matched US firms). See Appendix A for variable definitions. Robust standard errors are clustered at the firm and year levels. The standard errors are reported in parentheses. ***, **, and * indicates p-values of 1%, 5%, and 10%, respectively.

efficiency of the global capital market. The reduction in information asymmetry achieved through cross-border regulatory cooperation can lead to more informed investment decisions and ultimately contribute to the overall functioning and stability of the capital market. Overall, our findings highlight the positive impact of cross-border regulatory cooperation on the capital market and emphasize the value of continued efforts to strengthen international regulatory frameworks for the benefit of investors and market participants.

Data availability

Data will be made available on request.

Appendix A. Variable measurement

Key Variables of Interest	Definitions
ANALYST_COVERAGE	The natural logarithm of the number of analysts issuing forecasts in quarter *t*.
ANALYST_ERROR	The average analyst forecast error in quarter *t*. Analyst forecast error is the absolute difference between the forecasted and actual earnings, scaled by the stock price at the end of the quarter *t*.
ANALYST_DISPERSION	The standard deviation of analyst forecasts in quarter *t*.
ADR	An indicator that equals 1 if a firm is listed on the Bank of New York Mellon's ADR listing and 0 otherwise.
POST	An indicator that equals 1 in the year of MMoU entry and all years post-MMoU entry and 0 otherwise. For non-ADR U.S. firms, the year of MMoU entry corresponds to that of their matched ADR firm counterparts (i.e., the pseudo-MMoU years).
Firm-Level Control Variables	
ABS_DA	The absolute value of the residuals estimated using the modified Jones model in quarter *t*-1.
LARGE_NEG	An indicator that equals 1 when net income scaled by assets is less than −0.2, and 0 otherwise.
SMALL_POS	An indicator that equals 1 when net income scaled by assets is between 0 and 0.01, and 0 otherwise.
EARN_SMOOTH	The correlation between cash flows and accruals over the previous five years.
BIGN	An indicator that equals 1 if the auditor of the firm in quarter *t*-1 is a big N audit firm and 0 otherwise.
MF_ISSUE	An indicator that equals 1 if the firm issued a management earnings forecast in quarter *t* and 0 otherwise.
IO_FOREIGN	The percentage of foreign institutional investors in quarter *t*-1.
INSTI_OWNER	The percentage of institutional ownership in quarter *t*-1.
FIRMSIZE	The natural logarithm of total assets in quarter *t*-1.
ROA	Income before extraordinary items divided by total assets in quarter *t*-1.
LEV	The year-end ratio of the sum of current liabilities and long-term debt to total assets in quarter *t*-1.
BUS_SEG	The number of business segments in quarter *t*-1.
GEO_SEG	The number of geographic segments in quarter *t*-1.
RETURN_VOLATILITY	The standard deviation of daily stock returns in the last four quarters.
Analyst-Level Control Variables	
ANALYST_BUSY	The average number of individual analysts covering other firms in quarter *t*.
BROKERAGE_SIZE	The average brokerage size of individual analysts covering other firms in quarter *t*. Brokerage size is measured as the number of analysts employed by a brokerage in quarter *t*.
GENERNAL_EXP	The average general working experience of individual analysts in quarter *t*. General working experience is measured as the difference between the current year and the first year that an analyst issued forecasts.
FIRM_EXP	The average firm-specific experience of individual analysts covering firms in quarter *t*. Firm-specific working experience is measured as the difference between the current year and the first year that an analyst issued forecasts for a given firm.
Country-Level Control Variables	
PCGDP	GDP per capita (in US$ thousands) from the IMF World Economic Outlook Database in year *t*-1.
EQUITY	The importance of the equity market for our sample countries, calculated using their average ranking across the following three variables used in La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997): (i) the ratio of the total stock market capitalization held by minorities to the gross national product, (ii) the number of listed domestic firms relative to the population, and (iii) the number of initial public offerings relative to the population (Leuz, Nanda, & Wysocki, 2003).
LEG_ENF	The strength of law enforcement, calculated as the mean score of the three legal variables used in La Porta et al. (1998): (i) the efficiency of the judicial system, (ii) an assessment of the rule of law, and (iii) the corruption index. All three variables range from 0 to 10.
DIS_REG	The accounting standards variable from La Porta et al. (1998), which measures the level of disclosure required in each country.
Variables for Other Tests	
ADR_LEG_ENF_HIGH(LOW)	An indicator that equals 1 if *LEG_ENF* in the home country of an ADR firm is greater (less) than that in the U.S. and 0 otherwise.
ADR_DIS_REG_HIGH(LOW)	An indicator that equals 1 if *DIS_REG* in the home country of an ADR firm is greater (less) than that in the U.S. and 0 otherwise.
ADR_CUL_DIS_HIGH(LOW)	An indicator that equals 1 if *CUL_DIS* in the home country of an ADR firm is greater (less) than the sample median and 0 otherwise. *CUL_DIS* is measured as the average of the differences in the scores for Hofstede's six cultural dimensions between the U.S. and the ADR's home country. The six dimensions are the power distance index, individualism versus collectivism, the uncertainty avoidance index, masculinity versus femininity, long-term orientation versus short-term orientation, and indulgence versus restraint.
ADR_ NON_ENGLISH	An indicator that equals 1 if English is not an official language (de jure or de facto) in the ADR firm's home country according to the CIA Factbook and 0 otherwise.
ADR_ENGLISH	An indicator that equals 1 if English is an official language (de jure or de facto) in the ADR firm's home country according to the CIA Factbook and 0 otherwise.
ADR_INFCOMPARE_HIGH(LOW)	An indicator that equals 1 if the information comparability (i.e., *INFCOMPARE*) between an ADR firm and its matched non-ADR counterpart is greater (less) than the sample median and 0 otherwise.
INFCOMPARE	Information comparability, measured following the method used by Yip and Young (2012). First, ADR firm *i* and matched non-ADR firm *j*'s accounting function is estimated via the following equation: $ROA_{i,t} = \alpha^i + \beta^i RET_{i,t} + \varepsilon_{i,t}$, where ROA_{it} is the return on assets (an accounting performance measure) of ADR firm *i* in period *t*, calculated as income before extraordinary items divided by total assets in quarter *t*. RET_{it}, a proxy for economic events, is the stock return of firm *i* in quarter *t*. The coefficients α^i and β^i represent the estimated accounting function of an ADR firm. Using quarterly data, each firm's accounting function is estimated in the pre- and post-MMoU

(*continued on next page*)

(*continued*)

Key Variables of Interest	Definitions
	periods separately. The similarity between the accounting functions of ADR firm *i* and the matched non-ADR U.S. firm *j* is then computed as follows. First, firm *i*'s economic activity is translated into accounting ROA using its own accounting function (α^i and β^i) and the corresponding firm *j*'s accounting function (α^j and β^j) for each quarter. Two expected ROAs are obtained: $E(ROA)_{iit}$ and $E(ROA)_{jit}$. The mean values of these ROA differences in the pre- and post-MMoU periods are then calculated. Second, firm *j*'s economic activity is translated into accounting ROA using its own accounting function (α^j and β^j) and firm *i*'s accounting function (α^j and β^j). Two expected ROAs are obtained: $E(ROA)^j_{jt}$ and $E(ROA)^j_{it}$. The absolute values of their differences in each quarter are also obtained. Again, the mean value of these ROA differences are calculated for both the pre- and post-MMoU periods. Third, the mean of all of the differences in the pre-IFRS period (post-IFRS period) is calculated as the proxy for the information comparability between ADR firm *i* and its matched counterpart non-ADR U.S. firm *j* in the pre-IFRS period (post-IFRS period). We multiply the mean by −1 such that higher values represent greater comparability. Thus, a higher value of *INFCOMPARE* indicates greater financial statement comparability between an ADR firm and the matched non-ADR U.S. firm.
ADR_FSCOMPARE_HIGH(LOW)	An indicator that equals 1 if the financial statement comparability (i.e., *FSCOMPARE*) of an ADR firm is greater (less) than the sample median and 0 otherwise.
FSCOMPARE	Financial statement comparability, measured following the method used by De Franco et al. (2011). It is the absolute value of the difference in the predicted value of a regression of ADR firm *i*'s earnings on firm *j*'s return using the estimated coefficients for firms *i* and *j*, respectively. It is calculated for each firm *i* − firm *j* pair, $(i \neq j)$, $j = 1$ for *j* firms in the same two-digit SIC industry as firm *i*. To show the comparability of an ADR firm with all other industry peers, the average of all pairs for ADR firm *i* is taken. Higher values of *FSCOMPARE* represent greater financial statement comparability between an ADR firm and its industry peers.
ADR_MF_ISSUE_HIGH(LOW)	An indicator that equals 1 if *MF_ISSUE* (whether a firm issues an earnings forecast in a year) is 1 (0) and 0 otherwise.
ADR_ABS_DA_HIGH(LOW)	An indicator that equals 1 if *ABS_DA* is greater (less) than the sample median and 0 otherwise.
ADR_BROKERAGE_LARGE (SMALL)	An indicator that equals 1 if *BROKERAGE_SIZE* is greater (less) than the sample median and 0 otherwise.
ADR_GENERAL_EXP_HIGH (LOW)	An indicator that equals 1 if *GENERAL_EXP* is greater (less) than the sample median and 0 otherwise.
ADR_GLOBAL_EXP_HIGH(LOW)	An indicator that equals 1 if analysts' average prior experience forecasting non-U.S. firms is greater (less) than the sample median and 0 otherwise.
ADR_FOREIGN_EXP_HIGH(LOW)	An indicator that equals 1 if analysts' average prior experience forecasting foreign firms cross-listed in the U.S. (i.e., ADR firms) is greater (less) than the sample median and 0 otherwise.
AF_FREQ	Average analyst forecast frequency in quarter *t*-1.
AF_ITEM	Average number of analyst forecast items in quarter *t*-1.
AF_HERD	The absolute difference between analysts' forecast consensus and midpoints of management guidance in quarter *t*-1.
QUE_NUM	Natural logarithm of one plus the analysts' number of questions in the conference calls in quarter *t*-1.
QUE_LENG	Natural logarithm of one plus the analysts' word length of questions in the conference calls in quarter *t*-1.
POST_IFRS	An indicator that equals 1 for all observations of ADR firms after the date of IFRS adoption and 0 otherwise.
POST_PCAOB	An indicator that equals 1 for all observations of ADR firms after the date of PCAOB cooperation and 0 otherwise.
POST_REFORM	An indicator that equals 1 for all observations of ADR firms after the date of board reform and 0 otherwise.

Appendix B. PSM Results

The following model is used to predict the propensity scores to match ADR firm-quarter observations with non-ADR U.S. firm-quarter observations. The sample includes both ADR and non-ADR U.S. firm-quarter observations. The results in Table B1. See Appendix A for variable definitions. Robust standard errors are clustered at the industry and year level. The standard errors are reported in parentheses. ***, **, and * indicates *p*-values of 1%, 5%, and 10%, respectively.

Table B1
Estimation results.

Dep Var=	(1) *ADR*	
ABS_DA	3.593***	(0.748)
LARGE_NEG	0.329	(0.369)
SMALL_POS	−0.013	(0.084)
EARN_SMOOTH	−0.333***	(0.101)
BIGN	−0.368***	(0.086)
MF_ISSUE	−0.347***	(0.051)
IO_FOREIGN	−1.960***	(0.485)
INSTI_OWNER	−2.468***	(0.116)
FIRMSIZE	0.259***	(0.025)
ROA	0.650	(1.049)
LEV	−1.069***	(0.167)
BUS_SEG	−0.634***	(0.082)
GEO_SEG	2.311***	(0.069)
RETURN_VOLATILITY	−11.251***	(3.178)
ANALYST_BUSY	−0.031***	(0.008)
BROKERAGE_SIZE	0.008***	(0.002)
GENERNAL_EXP	0.041***	(0.010)
FIRM_EXP	−0.155***	(0.019)
Constant	−8.557***	(0.439)
Observations	226,810	
Industry FE	Yes	
Year FE	Yes	
Pseudo R^2	0.208	

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