**Creation and Segmentation of the Euronext Stock Exchange**

**and Listed Firms' Liquidity and Accounting Quality:**

**Empirical Evidence**

Grace Pownall

Goizueta Business School

Emory University

Maria Vulcheva

Florida International University

Xue Wang

Fisher College of Business

The Ohio State University

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**Abstract**

A primary goal of cross-border stock exchange mergers is to create deeper pools of liquidity. We investigate whether and how the formation of the Euronext stock exchange (from the Amsterdam, Brussels, Paris, and Lisbon exchanges) accomplished this goal. To facilitate deeper pools of liquidity, Euronext integrated the four trading platforms and started clearing all trades through the same system, allowing investors to trade equities of companies from all four countries, incurring transaction costs no higher than for securities from domestic companies. In addition, Euronext created two named segments on which firms could choose to be listed by committing to enhanced financial reporting quality and transparency.

We find that Euronext firms suffered the same decreased liquidity as other European firms during the sample period, but when we separate segment firms from non-segment firms, we find that the liquidity of segment firms increased at the time of the merger. To ensure that the liquidity benefits are linked to firms' pre-commitments to transparency and reporting quality, we exploit the cross-sectional differences in the extent to which segment firms complied with the provisions of their Commitment Agreements. We find that liquidity for those segment firms that complied more fully with the provisions of their Commitment Agreements increased more than did liquidity for segment firms that complied less fully. We conclude that listing on the named segments was associated with increased liquidity, as was compliance with the segment requirements. We also find evidence of increases in accounting quality for segment firms relative to non-segment firms using a number of accounting quality proxies prevalent in the literature, and evidence of larger increases in accounting quality for the segment firms that complied more fully with their pre-commitments.

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 **1. Introduction**

 A primary goal of stock exchange mergers is to create bigger and deeper pools of liquidity. The benefits to investors are lower transactions costs, easier information consolidation and price discovery, and more efficient prices. The benefits to the exchanges are increased revenues from trading and listing fees, data provision, and increased market share. The exchanges and investors also suffer less information asymmetry risk. Arnold, Hersch, Mulherin, and Netter (1999) document that the merger of three US regional stock exchanges in the middle of the last century was associated with increased liquidity and market shares from other exchanges. However, it is not clear that such benefits can be achieved in the context of a cross-border stock exchange merger. Studying changes in liquidity following the Euronext merger, Nielsson (2009) finds that liquidity benefits are not evenly distributed across firms but are instead limited to large firms and firms that operate internationally. This result suggests that firms' ability to benefit from stock exchange mergers is dependent on firm-specific characteristics, with nothing added by the newly integrated trading platform or the changes in its structure. Since larger, internationally active firms already have at their disposal alternative mechanisms to pre-commit to transparency and thereby enhance liquidity, such as cross-listing abroad, it is unclear what if any benefits firms realize following a cross-border exchange merger.

Firms’ credible commitments to transparency are not explicitly considered in Nielsson (2009), but prior studies (e.g., Leuz and Verrecchia, 2000) suggest increased transparency is associated with greater liquidity. In this paper, we revisit the Nielsson (2009) study by offering a new approach to investigating the impact of cross-border stock exchange mergers on liquidity of listed companies. In addition to the role of the integrated trading platform as a result of the stock exchange merger, we broaden the scope of inquiry by considering differences in the presentation and transparency of financial information and in regulatory environments. We also investigate whether it is possible for the newly consolidated exchange to make structural changes that facilitate the improvement in liquidity.

 Euronext was formed between 2000 and 2002 by the merger of the Amsterdam, Brussels, Paris, and Lisbon exchanges. To facilitate deeper pools of liquidity in listed firms' equities, Euronext formed an integrated trading platform,[[1]](#footnote-1) on which investors from all four countries could buy and sell securities of companies from all four countries in one marketplace, incurring transaction costs no higher than for domestic firms' securities and with all trades cleared through the same system. This is particularly important in Europe because according to a European Commission document,[[2]](#footnote-2) cross-border trading commissions could be as much as six times more than commissions for domestic securities.

 If the integration of the trading platform was successful, we should observe increased liquidity for the Euronext firms after the merger.[[3]](#footnote-3) On the other hand, if investors were hesitant to buy securities of non-domestic firms due to differences in the presentation and transparency of financial information or the enforcement of securities regulations, integrating the trading platform would make little difference. To encourage liquidity, Euronext created two named segments on which firms could choose to list by signing "Commitment Agreements" which obligated them to provide enhanced financial reporting quality and transparency. In return, the exchange committed to promote the segment firms so as to raise their visibility among analysts and investors by including them in the segment indices and special events and publications.

 The two segments of Euronext were named NextEconomy (for companies whose core business was in the technology sectors – IT, telecoms, electronics, broadcasting and internet media, e-business, biotechnology, and medical equipment) and NextPrime (for companies from the traditional sectors of the economy).[[4]](#footnote-4) Firms could choose to list on these named segments by committing to the use of (a) quarterly reporting; (b) financial reports prepared in accordance with IFRS; (c) English language in financial reports and news releases; (d) fully functioning websites; and (e) enhanced corporate governance practices. Firms that chose to join the named segments (segment firms) voluntarily signed agreements to abide by the higher standards of disclosure and corporate governance, and subjected themselves to the authority of the Euronext exchange to monitor their compliance with those standards. The firms granted Euronext the ability to delist from the segments firms that did not comply with the standards, and Euronext allocated resources from its profits to monitor compliance. The benefit of this arrangement to the firms was a way to credibly "bond" to the higher standards of accounting and disclosure[[5]](#footnote-5), and the benefit to the exchange was deeper pools of liquidity if investors believed the segment firms' commitments.

The merger of exchanges regulated by different national securities regulators may not create integrated capital markets and deeper pools of liquidity if national monitoring and enforcement of securities regulation is dissimilar (Grundfest 1990). Leuz (2010) discusses this problem, and presents evidence of substantial differences across jurisdictions in capital market development, securities regulation, investor protection, corporate governance, and adherence to the rule of law, among other characteristics. These differences endow national securities regulators with differing incentives and abilities to monitor and enforce compliance with securities regulation, which make de facto securities regulations different in different jurisdictions even if countries have uniform de jure rules. If investors perceive firms from foreign countries as being less or differently regulated than firms from their domestic capital market, granting investors access to low-cost opportunities to trade foreign equities may not overcome their reluctance and therefore may not have much impact on liquidity. To overcome the unevenness in national monitoring and enforcement, Leuz (2010) proposes the formation of a "Global Player Segment" (GPS) of the transnational capital market, on which firms could be listed by voluntarily committing to uniform standards of transparency, auditing, and corporate governance. Self-selection and the pre-commitment to enhanced financial reporting and disclosure quality would homogenize GPS firms' reporting incentives, which research has demonstrated have more influence on firms' financial reporting practices than do accounting standards (Ball, Robin, and Wu 2003, Bradshaw and Miller 2008, Barth, Landsman, and Lang 2007, and Daske, Hail, Leuz, and Verdi 2013, among others). Leuz (2010) envisions firms paying fees to a market regulator to monitor their compliance with their voluntary pre-commitments to increase investor confidence and therefore liquidity in the GPS firms' equities. In the case of the Euronext segments, the exchange took on the role of monitoring and enforcement in return for increased profits from capturing liquidity. To the extent that investors believed in the exchanges' incentive and ability to enforce transparency, segment firms should have gained more liquidity than non-segment firms.

We first test whether the integration of the trading platform led to increased liquidity for Euronext-listed firms, and find that Euronext-listed firms suffered the same decrease in liquidity experienced by the preponderance of Western European firms during the time period.[[6]](#footnote-6) However, when we separate segment firms from non-segment firms, we find that the liquidity of segment firms increased at the time of the merger. We conclude that it was the availability of the named segments that was associated with increased liquidity.

 We also test whether the increases in liquidity experienced by the segment firms were driven solely by their inclusion in the segment indices and the exchange's efforts to increase the visibility of the segment firms, or were also associated with firms' pre-commitments to increase financial reporting quality and transparency.[[7]](#footnote-7) We find that liquidity increased by more for the segment firms that complied more fully with the provisions of the Commitment Agreements than for those that complied less. From this we conclude that it was not just choosing to become listed on the segments that was associated with the liquidity increases, but also complying with the financial reporting provisions of the listing agreements.

In further analyses, we investigate changes in three common proxies of accounting quality for the segment firms relative to the non-segment firms, and for the segment firms that complied more fully with their Commitment Agreements relative to the non-segment firms. Using the non-segment firms as a benchmark, we find evidence of a significant increase in timely loss recognition, a significant decrease in income smoothing, and a significant reduction in the negative correlation between accruals and cash flows for the segment firms, in particular for the segment firms that complied more fully with their pre-commitments. The difference-in-differences between the segment and non-segment firms, as well as between the high-compliance segment firms and the non-segment firms, are statistically significant.

Taken together, these results suggest that the integration of trading platforms associated with cross-border stock exchange mergers may have positive effects on firms' liquidity by making listed firms available to a broader investor clientele and generating higher concentration of trading. However, in the absence of a single national regulator with both incentives and ability to monitor compliance with securities regulation, the increases in liquidity occur only in the presence of a credible mechanism to signal enhanced financial reporting and disclosure. By segmenting their listing categories, global stock exchanges can offer listed firms a credible way to bond to enhanced financial reporting quality, thus gaining more liquidity.

The empirical setting of Euronext is interesting for several reasons. First, the formation of Euronext came early in the ongoing wave of stock exchange consolidations and may offer lessons in structuring post-merger trading venues as the global consolidation of stock exchanges continues. Second, the merger gave the European Union its first integrated transnational stock market, making securities listed on any of the four predecessor exchanges readily available to the clients of members from all four exchanges. The goal of the integration of the trading platforms was to capture liquidity in listed firms' securities. Euronext is the only naturally occurring experiment in the extent to which liquidity can be enhanced by cross-border trading access in the absence of uniform regulation and enforcement.

Finally, the Euronext setting can provide evidence on alternative mechanisms for firms to bond to enhanced shareholder protection by subjecting themselves to more rigorous enforcement of stringent securities regulation. The formation of Euronext did not create the need for firms to bond to higher standards of transparency and disclosure, but it changed the costs and benefits associated with various mechanisms for bonding. Prior to the formation of Euronext, firms had other means to distinguish themselves by making commitments to transparency and disclosure, such as cross-listing their securities on other European exchanges (McLeay, Asimakopoulos, and Raonic 2004) or cross-listing in the U.S. (Lang, Raedy, and Wilson 2005).[[8]](#footnote-8) The formation of Euronext changed the cost structure of cross-listing in Europe by eliminating three candidate exchanges for cross-listing, and the establishment of the named segments offered a lower-cost alternative to cross-listing in the U.S. Firms could also have committed to the segment listing requirements without the named segments, but signing the Commitment Agreement which was at least tentatively monitored and enforced by the Euronext exchange enhanced the credibility of their bonding.

In the next section, we review the history and segmentation of the Euronext market. Section 3 develops the hypotheses. Section 4 describes the sample and empirical design, and presents results of the analyses of liquidity and financial reporting quality. Section 5 presents results using a propensity score matched control sample as well as other sensitivity analyses. Finally, section 6 presents a summary of and conclusions from our analyses.

**2. Euronext Background**

**2.1 Euronext History and Regulation**

Euronext is the second largest European exchange (now part of NYSE Euronext). According to its website, it is a Dutch public company with limited liability, with subsidiaries in Belgium, France, Netherlands, Portugal, and the United Kingdom.[[9]](#footnote-9) Euronext was formed in September 2000 by the merger of the exchanges in Amsterdam, Brussels and Paris. During July 2001, Euronext completed its Initial Public Offering, which resulted in listing Euronext’s shares on its own trading platform. In February 2002, Euronext merged with BVLP, the Portuguese stock market, and Euronext Lisbon was created.

Euronext was successful in the technological integration of the predecessor exchanges’ trading platforms. In September 2002, all Euronext members, regardless of their location, were able to access all securities listed on Euronext. In November 2003, Euronext Lisbon successfully migrated to the new trading and clearing systems. As a result, all Euronext products listed in Amsterdam, Brussels, Paris, and Lisbon are traded through Nouveau System Cotation (NSC) and cleared by Clearnet. The centralized, order-driven trading system, along with the central clearing system, settles transactions on a net basis to guarantee performance (Poser 2001). This creates the potential for greater cost-saving because most of the costs of building trading and clearing platforms are fixed.

At the same time, Euronext worked actively with regulators in the individual jurisdictions to harmonize various rules and regulations. The Euronext Rulebook currently has two books: Rulebook I contains harmonized rules that are contractual agreements among the market participants of Euronext, and Rulebook II contains the remaining rules of the individual markets that have not been harmonized. The coverage of Rulebook I has gradually increased from harmonized membership rules, trading rules, and enforcement rules in the early periods to the development of a common set of listing qualifications and disclosure requirements applicable to listed companies in later periods (starting in February 2005). Today, if a company seeks to list its equities on a Euronext market, it must comply with the unified listing requirements as specified in Rulebook I, and after admission, it must comply with the ongoing financial reporting requirements as specified by the authority of the home member state.

**2.2 Creation of the Two Named Segments**

Euronext created two market segments – NextEconomy and NextPrime – launched in January 2002 for companies listed in Amsterdam, Brussels, and Paris, with Lisbon added in May 2003.[[10]](#footnote-10)  The creation of the named segments had two purposes: (1) to meet the needs of investors seeking greater transparency and liquidity; and (2) to allow companies to increase their visibility to investors and therefore liquidity by complying with a number of pre-commitments to enhanced accounting quality, disclosure, and governance.

NextEconomy and NextPrime were designed for small and mid-cap firms. They did not replace any existing regulated market but were in addition to being listed on one of the four national Euronext exchanges. Euronext-listed companies joined the segments voluntarily by signing Commitment Agreements the specific requirements of which were to (1) publish quarterly financial reports beginning in 2004; (2) adopt international accounting standards (or reconcile existing information with those standards) beginning in 2004; (3) publish financial documents in English beginning in 2002; (4) schedule at least two meetings annually for analysts; (5) describe corporate governance policy in the annual report; (6) announce a schedule for publications and meetings beginning in 2002; and (7) publish key financial information on their websites beginning in 2002. Once firms signed Commitment Agreements (also referred to as Commitment Charters or Inclusion Agreements), Euronext assured them of additional visibility by including them in the segment indices, and committed to actively seek to raise the profile of segment companies through events and publications.

As of December 31, 2001, 107 companies were on the NextPrime segment and 93 companies were onthe NextEconomy segment, representing market capitalization of Euros 65.18 billion (Euronext NV Annual Report 2001). Over the years the segments existed (2002 through 2007), Euronext dropped 39 of our sample firms from the segments for cause, and added 19 more sample firms to the segments at their petition.[[11]](#footnote-11) Given Euronext's goal of capturing liquidity in European firms' shares, it is not surprising that few firms were actually dropped for cause. Although Euronext did not have incentives to drop many firms, dropping at least some made the threat of exclusion for sufficiently egregious violations or failure credible for the remaining firms.

On October 23, 2007, Euronext announced the discontinuation of the NextEconomy and NextPrime segments.[[12]](#footnote-12) Euronext gave as its reason the EU Transparency Directive's requirements for enhanced transparency and disclosure for all publicly-traded firms in Europe,[[13]](#footnote-13) and therefore the inability of firms to voluntarily distinguish themselves by pre-committing to the higher standards, as follows:

Changes to EU regulations, more specifically regarding contents and deadlines for publications by listed companies following the Transparency Directive, entail that Euronext no longer needs to maintain the quality-based segments NextPrime and NextEconomy, introduced by Euronext on January 1st, 2002 with the aim of meeting the highest standards in terms of communications. Certain requirements that applied at the time the companies were admitted, now apply to all listed companies under the new regulatory framework.

**2.3 Comparison of Segment and Non-Segment Firms' Reporting and Disclosure Practices**

To provide evidence on the extent to which firms listed on the named segments of Euronext improved financial reporting practices as required by the Commitment Agreements, we collected data on the incidence of several practices related to financial reporting and disclosure quality between segment and non-segment firms, and between the two segments.[[14]](#footnote-14) Because scarce resources act as a constraint on monitoring and enforcement, we did not expect to observe perfect compliance. We compare characteristics between the segment and non-segment firms in table 1, based on all available firm-years for sample firms listed on the NextPrime and NextEconomy segments of Euronext, plus a random sample of 150 Euronext-listed firms not included on either named segment.[[15]](#footnote-15) Sources of data on the use of a global auditor (Big Five or Big Four), the use of IFRS, the release of quarterly reports in any year, and the use of English as a primary or secondary reporting language are ThomsonOne filings and searches of company websites. The Website Score variable is from Frost, Gordon, and Pownall (2010), and the source of data on websites comes from current websites for each sample firm and from the Internet Archive Wayback Machine available at http://www.archive.org/web/web.php for previous years' websites. The Website Score is a categorical variable taking on the following values: 0 if the firm has no website; 1 if the firm provides a domestic language website; 2 if the firm provides an English version of the website; 3 if the English version apparently mirrors (in form and content) the domestic language version; 4 if the website provides an investor relations page; 5 if the website provides current financial statements; 6 if the website provides archived financial reports; 7 if the website provides press releases; and 8 if the website provides conference calls (Frost et al. 2010). Functioning Website is the percentage of firms in each category that have values of 1 or more on the Website Score.

[Insert Table 1 About Here]

The first four lines of table 1 compare the use of global auditors across segment and non-segment firms.[[16]](#footnote-16) As of the establishment of the two named segments (2002), more segment firms than non-segment firms retained global auditors, and although the use of global auditors rose fairly consistently over time it remained higher for the segment firms. The second group of four lines compares the use of IFRS over time and between segment and non-segment firms. Almost no Euronext-listed firms used IFRS when the segments were established, but one third of segment firms had adopted IFRS (as they had agreed in their Commitment Agreements) by 2004. Substantial numbers of both segment and non-segment firms had adopted IFRS by 2005 (87% and 58%, respectively), and adoptions continued to rise through 2009. We observe, however, that adoption of IFRS was far from complete for the non-segment firms, even in 2009, at 73%.[[17]](#footnote-17)

The third group of four lines gives the incidence of quarterly reporting. In 2002, approximately one third of segment firms were already issuing quarterly reports, relative to only 9% of non-segment firms. By 2004, nearly half of segment firms were reporting quarterly compared with 10% of non-segment firms. Although the incidence of quarterly reporting continued to rise for both segment and non-segment firms, quarterly reporting was far from universal as recently as 2009, with 37% of non-segment firms, 39% of NextPrime firms, and 89% of NextEconomy firms publishing quarterly reports.[[18]](#footnote-18)

The fourth group of lines compares the incidence of primary or secondary reports in English. Segment firms were ten times more likely to report in English than non-segment firms at the beginning of the period (81% vs. 8% in 2002), and 3.5 times more likely at the end of the period (88% vs. 25% in 2009).

Finally, the last two groups of four lines compare characteristics of sample firms' websites through time and across segment and non-segment firms. At the beginning of the period, the average non-segment firm had a website and might have offered an English language version (score of 1.47), compared with the average segment firm which had a website, with an English version substantially similar to the domestic language version and an investor relations page that may have provided financial statements (score of 4.29). Scores for all categories of firms rose monotonically over the period, and by the end of the period the average segment firm provided financial statements and may have provided archived financial reports (score of 5.79) relative to the average non-segment firm with a score of 3.77. Functioning websites have become standard for Euronext-listed firms, from a low of 59% of the non-segment firms and 85% of the segment firms in 2002 to nearly 100% of segment firms and 89% of non-segment firms at the end of the period.[[19]](#footnote-19)

 For our cross-sectional empirical tests, we compute a measure based on the average of the five variables in table 1 that capture dimensions of the quality and accessibility of the firm's financial statements (global GAAP, English, global auditor, functioning website, and quarterly reporting). We split the segment firms at the median of this measure and define a variable Compl5 which is equal to one if the segment firm is at or above the median and zero if the segment firm is below the median. We also compute a measure based on the average of four variables in table 1 (global GAAP, English, global auditor, and functioning website). We employ these four components because they are more likely to capture the availability and comparability of accounting information, while quarterly reporting only reflects the frequency of information updates. We split the firms at the median of this measure and define a variable Compl4 which is equal to one if the sample firm is at or above the median and zero otherwise. See table 2 for formal definitions of Compl4 and Compl5, and tables 5 and 8 for analyses using these variables.

**3. Hypotheses Development**

 There are several reasons to expect that trading liquidity of Euronext-listed firms increased when the four exchanges merged. First, transactions costs fell substantially when the trading platforms were integrated and settlement and clearing procedures were standardized across the four countries (The Economist 2006). Second, the securities of listed firms from all four countries were made available by the exchange to investors from all four countries, substantially increasing the pool of potential shareholders for all listed firms.[[20]](#footnote-20)

However, the decrease in transaction costs as a result of the merger might not have been accompanied by an increase in liquidity if investors were hesitant to buy securities of non-domestic firms due to differences in the transparency of financial information or the enforcement of securities regulations. While Euronext has developed a common set of listing qualifications and disclosure requirements applicable to all listed companies, Euronext has no power of enforcement on its own other than the threat of delisting, which is not an attractive option when the goal of Euronext is to maximize utility through garnering liquidity. Thus, firms listed on Euronext continue to be regulated by the regulatory agencies of their own home exchanges, and the strength of enforcement differs considerably across these four exchanges (Poser 2001, page 538). [[21]](#footnote-21)For example, using the resources provided to the securities regulator in a country as a proxy for enforcement, Jackson and Roe (2009) find that for 2005 Amsterdam has the strongest enforcement out of the four markets – the market regulator on average employs a staff of 23 people per million of the Netherlands’ population and relies on a budget of 131,285 per billion dollars of Netherlands’ GDP. In contrast, Paris is the market with the weakest enforcement as measured by the staff of its market regulator (only 6 people per million of France’s population), and Brussels is the market with weakest enforcement based on the budget of its capital market’s regulator (27,275 per billion dollars of Belgium’s GDP).[[22]](#footnote-22) Therefore, firms are still subject to different institutional arrangements and legal enforcement mechanisms in their home countries, which provide firms with different incentives to use discretion when providing additional disclosure.[[23]](#footnote-23) Further, Euronext-listed firms are also able to use the integration of exchanges to avoid strict regulation by shifting listing among exchanges (Piotroski and Srinivasan 2008). Therefore, to test whether the Euronext merger resulted in liquidity benefits, we formulate the following hypothesis:

***H1: Stock market liquidity increased for Euronext-listed firms when the predecessor exchanges merged and integrated their trading platforms.***

 On the other hand, we expect that if Euronext's commitment to promote the visibility and reputations of the firms that choose to list on the named segments was effective, liquidity increased more for the segment firms relative to the non-segment firms, controlling for other firm-specific characteristics. However, the effective operation of the two named segments strongly depends on the ability of Euronext to establish unified rules and enforcement mechanisms at the segment level regardless of the national institutional differences that still persist. If the creation of the two named segments is unable to deal with the ongoing national differences, there will be no added liquidity benefits for segment vs. non-segment firms from the pre-merger period to the post-merger period.[[24]](#footnote-24) Thus, to test whether the creation of the segments resulted in liquidity benefits for firms that chose to join them we formulate the following alternative hypothesis:

***H1A: Stock market liquidity increased more for segment firms than for non-segment firms when the predecessor exchanges merged and integrated their trading platforms.***

Finally, we are interested in whether the mechanism of segment firms voluntarily signing Commitment Agreements was sufficient. It may have been that investors' attention was drawn to the segment firms by the exchange's promotional efforts, but investors traded more freely only in those firms that honored their reporting commitments. Therefore, we expect that the increase in liquidity for the firms signing Commitment Agreements was a function of their firm-specific compliance with their pre-commitments to enhanced transparency, reporting quality, and corporate governance, rather than simply of the efforts of the exchange, leading to the hypothesis:

***H1B: Stock market liquidity increased more for segment firms that complied more fully with the requirements of their Commitment Agreements.***

 In an effort to establish a more direct link between stock market liquidity and accounting quality, we also examine changes in accounting quality for Euronext listed companies from the pre- to the post-merger period. There are several reasons to expect that Euronext-listed firms increased their accounting quality at the time in the merger. First, the integrated trading platform made their securities available to a substantial pool of investors who were less familiar with the firms than were their domestic investors, and firms may have increased the transparency of their financial reporting to compensate for the lack of familiarity. Second, Euronext engaged in a continuous process of standardizing listing and trading rules in Rulebook I, and each Rulebook II codified continuing reporting rules for listed firms. As Rulebook II evolved, it is reasonable to suppose that the development and standardization of continuing reporting requirements may have been associated with increases in firm-specific reporting quality. For these reasons, our second main hypothesis is:

***H2: Accounting quality increased for Euronext-listed firms when the predecessor exchanges merged and integrated their trading platforms.***

 On the other hand, the threat of delisting by the exchange, highlighting for investors the failure to honor their reporting quality pre-commitments, gave segment firms incentives to comply with the enhanced reporting quality outlined in the Commitment Agreements. Thus, we expect that the increases in accounting quality were more pronounced for the firms that explicitly pre-committed to enhanced financial reporting by choosing to become listed on the named segments, controlling for other firm-specific characteristics, leading to the hypothesis:

***H2A: Accounting quality increased more for segment firms than for non-segment firms when the predecessor exchanges merged and integrated their trading platforms.***

Finally, we hypothesize that the segment firms that did more to honor the reporting provisions of their Commitment Agreement achieved higher quality earnings than the segment firms that complied less fully. Most of the reporting requirements of the Commitment Agreements do not map directly into common proxies for earnings quality. However, to the extent that abiding by the pre-commitments is a reflection of firms' reporting incentives, we expect that segment firms that comply more fully with their promised enhancements to financial reporting quality will also make measurement choices associated with higher quality earnings, leading to the hypothesis:

***H2B: Accounting quality increased more for segment firms that complied more fully with the requirements of their Commitment Agreements.***

**4. Empirical Design and Results**

**4.1 Sample Selection and Descriptive Statistics**

Our initial sample includes 1,058 domestic firms (8,622 firm-years) listed on the Amsterdam, Brussels, Paris, and Lisbon stock exchanges in the period 1993–2007 with accounting and market data available in WorldScope and Datastream.[[25]](#footnote-25) For the firms in our sample, we collect from WorldScope financial variables and the number of foreign exchanges on which the sample companies are listed. As table 3, panel A shows, we removed 256 firms and 2,599 firm-years for missing accounting and control variables. Due to the presence of outliers in the data, we further removed the top and bottom 0.5% of the returns, earnings, and price variable distributions, with a loss of 24 firms and 461 firm-years. To balance the data and to avoid estimation error due to different samples in the pre- vs. post-merger periods, we removed 249 firms (706 firm-years) that lacked either pre- or post-merger data.[[26]](#footnote-26) We use the Euronext Cash Market-Monthly Statistics to determine which of the companies in our sample are listed on the NextPrime and NextEconomy segments. The final sample for primary analyses is 529 firms with 4,856 firm-years. When we replicate the analysis using propensity score matching (see section 5), we lose a further 55 firms and 2,410 firm-years, leaving 474 firms with 2,446 firm-years. Because our results with and without propensity score matching are similar, we discuss the results using the larger sample first, with the propensity score matched results reported as a diagnostic.

[Insert Tables 2 and 3 About Here]

Panel B of table 3 presents descriptive statistics for the variables used in our liquidity and accounting quality analyses as well as several firm characteristics, and panel C provides the same statistics partitioned by the segment vs. non-segment distinction. Comparison of the means reported in panel C suggests that both before and after the merger, relative to the non-segment firms, the segment firms have less negative accruals (as a percentage of total assets), lower bid-ask spreads, fewer non-trading days, higher sales growth, lower leverage, higher assets turnover, greater likelihood of using a global auditor, lower likelihood of being listed also on U.S. exchanges, and more volatile stock returns. Segment firms also have marginally lower operating cash flows (OCF) before but not after the merger.

**4.2 Liquidity Analyses**

First, we conduct empirical analyses to (i) assess the impact of the Euronext formation and segmentation on stock market liquidity[[27]](#footnote-27) for Euronext-listed firms, (ii) compare the impact on the segment vs. non-segment firms, and (iii) assess the extent to which changes in liquidity were associated with segment firms' compliance with the financial reporting provisions of their Commitment Agreements. These analyses are tests of hypotheses H1, H1A, and H1B, respectively.

**4.2.1 Empirical Design**

We use two proxies for liquidity. Following Ashbaugh, Gassen, and LaFond (2006), we define perc\_zeroret as the percentage of trading days with zero return in year t. Smaller values of this variable indicate fewer days during the year on which no trading occurred, and therefore higher liquidity. The mean bid-ask spread for firm i in year t (mn\_bidask) is (AskPrice - BidPrice)/(AskPrice + BidPrice)/2, with data from Datastream. Recall from table 3 that the bid-ask spread and perc\_zeroret (mean and median) were significantly lower for the segment firms relative to the non-segment firms before and after the merger, consistent with the segment firms trading with more liquidity in both periods. The liquidity measures for the non-segment firms worsened after the merger, but both measures showed increased liquidity after the merger for the segment firms. The differences are statistically significant (not tabulated), consistent with the non-segment firms suffering lower liquidity and the segment firms gaining liquidity after the merger. We present diagnostic analyses in the fifth section of the paper on the effects of the decrease in liquidity for the non-segment firms, which was common during the early 2000s across European stock markets.[[28]](#footnote-28)

We conduct formal empirical analysis by running the following regression:

Liquidity Proxy = β0 + β1\*Segment + β2\*Post-Merger + β3\*Post-Merger\*Segment

 + ∑βi\*Control Variables + εit (Eq. 1)

where Segment is an indicator variable for those firms that belong to the named segments of Euronext, and Post-Merger is an indicator variable that equals one after the merger. This is a difference-in-differences design in which changes in liquidity of the non-segment firms serve as a benchmark for evaluating changes in liquidity of the segment firms.[[29]](#footnote-29) This design controls for other country, time period, and exchange factors that influence liquidity for both the segment and non-segment firms. A test for significance of the coefficient on Post-Merger(β2) is a test of hypothesis H1 that liquidity increased for Euronext-listed firms after the merger, and a significance test on the coefficient on the interaction term (β3) is a test of hypothesis H1A that liquidity increased for the segment firms relative to the non-segment firms after the merger, controlling for firm-specific characteristics. The control variables include leverage, profitability, the number of foreign exchanges on which the firm is listed, sales growth, size, auditor, whether the firm reports using IFRS or US GAAP, whether the firm is listed in the U.S., and the variability of stock returns.[[30]](#footnote-30) We also include country and industry fixed effects and cluster the standard errors in the model by firm.

**4.2.2 Empirical Results**

Table 4 presents the results of estimating the regression in Eq. (1). The dependent variable in columns (1) through (3) is the annual percentage of non-trading days (perc\_zeroret), and the dependent variable in columns (4) through (6) is the natural log of the mean bid-ask spread (log\_mn\_bidask).[[31]](#footnote-31) Because the results are similar across the regressions with and without control variables, we focus our discussion on columns (2) and (5), which include control variables.

[Insert Table 4 About Here]

In column (2), the percentage of non-trading days increased from pre- to post-merger on average across the sample (the Post-Merger coefficient is positive and significant). This result is inconsistent with hypothesis H1 on the effects of the integration of the trading platform on Euronext-listed firms' liquidity. Prior to the merger the firms that eventually listed on the segments had fewer non-trading days than the rest of the sample (the Segment coefficient is negative and significant), and firms that chose to list on the named segments had significantly fewer days with no trading than the rest of the sample after the formation of Euronext (the coefficient on the interaction term of Post-Merger and Segment is significant and negative). This result is consistent with hypothesis H1A, that joining the named segments was associated with higher liquidity after the merger relative to the non-segment firms. Liquidity (represented by the percentage of trading days with zero returns) is higher for less leveraged, more profitable, and larger firms, and firms with faster growth and global auditors, using IFRS or US GAAP, and with more volatile returns. The adjusted R2 of the regression including control variables is 49%.

The results in column (5) with the logarithm of mean bid-ask spread as a proxy for liquidity are similar to those using percentage of non-trading days as the liquidity proxy. The coefficient on Post-Merger is not significant, meaning that liquidity did not increase on average across the sample, inconsistent with hypothesis H1. The coefficient on Segment is again negative and significant. Consistent with hypothesis H1A, the coefficient on the interaction term of Post-Merger and Segment is negative and marginally significant, meaning that the segment firms gained more liquidity after the merger than did the non-segment firms. The coefficients on several control variables (leverage, profitability, size, global auditor, and use of global GAAP) are significant and broadly consistent with the results in column (2), except that we also find that being listed on a U.S. exchange is significantly associated with higher liquidity. The adjusted R2 in column (5) is 64%.

Finally, columns (3) and (6) of table 4 include an additional variable to measure the effect on liquidity when a firm ceased to be listed on one of the segments but continued to be listed on Euronext in the post-merger period, or conversely when a firm became listed on one of the segments after initially being a non-segment firm listed on Euronext post-merger. *afterdrop\_beforeadd* is an indicator variable that takes the value of one after firms are dropped from a segment or before firms are added to a segment, all during the post-merger period.[[32]](#footnote-32) If the improvements in liquidity for the segment firms were primarily driven by their commitments to abide by the segment rules and/or by the increased visibility provided by the exchange for segment firms, and not by firm characteristics, we should observe increases in liquidity when non-segment firms subsequently join a segment, and decreases in liquidity when segment firms are dropped from the segments. Therefore, we expect an increase in non-trading days and an increase in bid-ask spreads associated with the period before a firm joins or after a firm is dropped from the segment. Consistent with those expectations, we find a positive coefficient on *afterdrop\_beforeadd* based on regressions with either non-trading days or mean bid-ask spreads, but the coefficient is not significant in the logarithm of mean bid-ask spread regression. In untabulated results, we support the same inference if the indicator variable takes a value of one only for the dropped firms.

Although it is troubling that liquidity decreased for the Euronext firms from pre- to post-merger, we believe that this drop in liquidity reflects the overall decrease in liquidity in European markets from 2000 to 2004 (see Vagias and van Dijk 2012, especially figure 3). We speculate that this pronounced spell of illiquidity may have been the result of an economic recovery which was much slower in Europe than in the rest of the world (see Rhoads 2002). Under the circumstances, the use of non-segment firms from the same jurisdictions as the segment firms is an important control for secular trends in liquidity. See section 5 for sensitivity analyses using different benchmarks for secular trends in liquidity.

**4.2.3 Liquidity Changes and Compliance with Segment Requirements**

 Table 5 shows the results of tests of hypothesis H1B that liquidity increased at the time of the merger for high-compliance segment firms. For table 5, we estimated the liquidity regressions on only the segment firms using a difference-in-differences design to compare high-compliance firms to low-compliance firms (based on Compl4 and Compl5 as outlined in section 2.3). The difference-in-differences design allows us to control for Euronext's promotional activities on behalf of the segment firms, as well as the market's evaluation of the ability of Euronext to monitor and enforce the provisions of the Commitment Agreements, while focusing on firms' efforts to comply with their Commitment Agreements. Columns (1) and (4) report on regression specifications using perc\_zeroret and log\_mn\_bidask, respectively, as the dependent variable, with Post-Merger, Compl5, an interaction between Post-Merger and Compl5, and control variables. Columns (2) and (5) contain results from estimating regressions of perc\_zeroret and log\_mn\_bidask, respectively, on Post-Merger, Compl4, the indicator variable for quarterly reporting alone (Qtrly), an interaction between Post-Merger and Compl4, an interaction between Post-Merger and Qtrly, and control variables. Columns (3) and (6) report on results of estimating regressions of perc\_zeroret and log\_mn\_bidask, respectively, on Post-Merger, indicator variables for at or above the median of each of the five financial reporting variables comprising Compl5 separately (quarterly reporting, global GAAP, global auditor, English, and website), interactions between Post-Merger and each of the five reporting variables, and control variables.

[Insert Table 5 About Here]

 Table 5 presents evidence that nonzero values of both Compl4 and Compl5 (as well as use of English and functioning website individually) are associated with increases in liquidity after the merger, with the results significant only for the bid-ask spreads regressions. In addition, quarterly reporting is strongly associated with liquidity both before and after the merger, but with different signs (for both liquidity proxies, columns (2) and (5)). Specifically, more quarterly reporting in the pre-merger period is associated with increased liquidity, but does not have an incremental effect on liquidity in the post-merger period (positive signs on the interaction variable for both proxies, significant only for the perc\_zeroret regression). This appears to suggest that Compl4 and quarterly reporting capture different aspects of segment firms’ information environment, with differing impacts on liquidity in the post-merger period. Finally, we include the individual components of the compliance measure and their interaction with post-Merger separately in the regression to identify the specific information features that affect liquidity in the post-merger period. Note that we have machine readable data for the use of IFRS or US GAAP and global auditors in the entire sample period, therefore we use these data along with hand collected data on the other three dimensions in the regression model. The results in column (3) and (6) suggest similar results on quarterly reporting as those in columns (2) and (5). On the other hand, we note that the use of IFRS or US GAAP individually is strongly associated with increases in both measures of liquidity after the merger. These results are consistent with hypothesis H1B, that liquidity increases after the merger were associated with the extent to which segment firms complied with the provisions of their Commitment Agreements.[[33]](#footnote-33)

**4.3 Accounting Quality Analyses**

We next document and compare the effects of the Euronext formation on listed firms' accounting quality. These analyses are tests of hypotheses H2 (accounting quality increased for all Euronext-listed firms at the time of the merger), H2A (accounting quality increased for segment firms relative to non-segment firms), and H2B (accounting quality increased more for high-compliance segment firms). While there is no universally agreed upon empirical measure of accounting quality, to the extent the results of various analyses support a general conclusion, the strength and creditability of the results are enhanced (Burgstahler et al. 2006, Barth et al. 2007, and Lang et al. 2003, among others). We take the approach of examining several proxies for accounting quality that we are able to sign and interpret more clearly. Specifically, we examine a market-based accounting quality measure, timely loss recognition (TLR), in section 4.3.1, and several earnings management based accounting quality measures taken from Leuz et al. (2003), Barth et al. (2007) and Lang et al. (2003) in section 4.3.2.

**4.3.1 Timely Loss Recognition**

**Empirical Design** We expect firms with higher quality accounting to incorporate bad news into earnings measurements in a more timely manner, leading to a higher association between stock returns and negative accounting earnings. Following prior studies (Basu 1997, Ball, Kothari, and Robin 2000, and Khan and Watts 2009, among others), our measure of TLR comes from a reverse regression of earnings per share on annual stock returns:

NI\_Assets = β0Return + β1NegRet + β2Return\*NegRet + β3Post-Merger + β4Post-Merger\*Return

+ β5Post-Merger\*NegRet + β6Post-Merger\*Return\*NegRet + ε (Eq. 2)

Specifically, we regress earnings on returns separately for good news and bad news firm-year observations, with observations classified as bad news if returns are negative and good news otherwise. The regression specification includes an indicator variable for the period after the merger (Post-Merger), and interactions between Post-Merger and Returns for both good and bad news firm-years. The coefficient of interest is that on the interaction Post-Merger\*Return\*NegRet.

**Empirical Results** Table 6 presents the results of our TLR analyses, comparing TLR of earnings between the pre-merger and post-merger periods for the segment and non-segment firms, and between the high-/low-compliance segment firms and non-segment firms. We use Compl4 to partition the segment firms because the results in table 5 suggests that quarterly reporting has a different effect on liquidity from the other four dimensions of compliance in the post-merger period. Specifically, we refer to segment firms with Compl4=1 as “high-compliance firms” and firms with Compl4=0 as “low-compliance firms.” The results in table 6 show that TLR, measured as the coefficient on the interaction Post-Merger\*Return\*NegRet from Eq. (2), is marginally significant for the non-segment firms (column (1)) and highly significant for the segment firms (column (2)), indicating that bad news is incorporated more quickly into earnings after the merger than before. To the extent that timely loss recognition is a reasonable proxy for quality of earnings, this result is consistent with an increase in earnings quality after the merger for all Euronext-listed firms. The coefficient estimate for the segment firms is more than twice that for the non-segment firms, although the difference is not significant at conventional levels (column (3) with p-value=1.35).[[34]](#footnote-34)

Columns (4) through (6) compare TLR for the non-segment firms with TLR for the low-compliance segment firms, and show that the coefficient on the interaction Post-Merger\*Return\*NegRet is not significant at conventional levels for the low-compliance segment firms, nor is the difference in TLR between the non-segment and low-compliance segment firms. Columns (7) through (9) compare TLR for the non-segment firms to TLR of the high-compliance segment firms. The coefficient on the interaction Post-Merger\*Return\*NegRet for the high compliance segment firms is highly significant and more than three times the magnitude of the same coefficient for the non-segment firms, and the difference is statistically significant (at the level of .10, two-sided t-test). Taken together, this evidence is consistent with hypothesis H2 (that accounting quality increased for Euronext-listed firms at the time of the integration of trading platforms) and with H2B (that accounting quality increased more for high-compliance segment firms), although we are unable to document a significant difference in the increase in accounting quality between non-segment firms and segment firms when we include the low-compliance segment firms.

[Insert Table 6 About Here]

**4.3.2 Non-Market Measures of Accounting Quality**

We next compare differences in earnings management proxies between segment and non-segment firms from before to after the formation of Euronext. These proxies for earnings management are variability of net income relative to variability of OCF and correlation between accruals and OCF.

**Empirical Design** We expect firms with higher accounting quality to have less smoothed earnings. Therefore, we examine statistical properties of earnings and related variables to measure the extent to which earnings have been smoothed. Following Barth et al. (2007), Lang et al. (2003), and Burgstahler et al. (2006), our empirical measure is the variability of residuals from the following regression:

NI\_Assets = 0 + 1Size + 2Sales Growth + 3OCF\_assets + 4Leverage + 5Turn

 + 6Auditor + 7USCROSSLISTED + 8# FExchanges + kExchange + kIndustry + it (Eq. 3)

estimated at the firm-year level, where firm and year subscripts are suppressed, and all variables are as defined previously and on table 2.[[35]](#footnote-35) “Exchange” and “Industry” indicate that the regression includes exchange and industry fixed effects. Table 7 presents in column (1) the details of this estimation, and shows that all variables are significantly associated with net income deflated by total assets, and the adjusted R2 of the regression is 41%. The firm-year-specific residuals of this regression represent the part of net income that cannot be explained by the factors we include in the regression.

To control for the underlying variability of sample firms' earnings process, we compare the variability of net income to the variability of the underlying OCF for both the segment and non-segment firms in the pre- vs. post-merger periods.[[36]](#footnote-36) We expect that for a given level of volatility in OCF, higher volatility of net income indicates that it has been subject to less earnings management and is therefore of higher quality. We measure the variability of net income as the standard deviation of the residuals from Eq. (3), and the variability of OCF as residual standard deviation from the following regression:

OCF\_Assets = 0 + 1Size + 2Sales Growth + 3Leverage + 4Turn + 5Audit

 + 6USCROSSLISTED + 7# FExchanges + kExchange + kIndustry + it (Eq. 4)

estimated at the firm-year level, where firm and year subscripts are suppressed. Table 7 presents in column (2) the details of this estimation, and shows that all variables except Auditor and the number of foreign exchange listings are associated with OCF deflated by total assets, and the adjusted R2 is 11%.

[Insert Table 7 About Here]

We also compare the Spearman correlation between accruals and OCF pre- and post-merger. We expect firms with higher accounting quality to have less negative correlation between accruals and OCF, because less earnings smoothing means that fewer discretionary accruals have to be reversed in the following year. Following Barth et al. (2007), we compute the correlation of accruals and OCF as the correlation of firm-year-specific residuals from Eq. (4) and those from the following accruals regression:

Accruals\_Assets = 0 + 1Size + 2Sales Growth + 3Leverage + 4Turn +

 5Auditor + 6USCROSSLISTED + 7# FExchanges + kExchange + kIndustry + it (Eq. 5)

where year and firm subscripts are suppressed. Table 7 presents in column (3) the details of this estimation, and shows that all variables except Turn and USCROSSLISTED are significantly associated with accruals deflated by total assets, and the adjusted R2 is 7%.

**Empirical Results** Table 8 reports comparisons of the properties of residuals from Eq. (3) through (5) for the segment and non-segment firms both pre- and post-merger. To test the statistical significance of the difference in differences, we use a bootstrap procedure (see Dichev and Tang 2009 for a similar procedure). First, we randomly assign firms to non-segment, segment, low-compliance segment, and high-compliance segment firm groups and recompute the pre-merger and post-merger values of the variables. We compare the pre- to post-merger differences from the randomly generated sample classifications to the actual difference from pre- to post-merger. We repeat these steps 1,000 times and the resulting p-value is the number of times that the randomly generated difference is higher than the actual difference divided by the number of iterations.

The first panel of the table shows that both before and after the merger, the variability of net income was slightly higher for the segment firms than for the non-segment firms, but the difference is not significant. Variability of earnings for the segment firms increased significantly at the time of the merger. When the segment firms are broken down into high- and low-compliance firms, the significant increase in variability of net income is confined to the high-compliance segment firms.

Controlling for the underlying variability in OCF, the second panel shows that relative to the non-segment firms, the ratio of variability of net income to the variability of OCF was lower for segment firms before the merger but increased by significantly more after the merger, consistent with an increase in accounting quality for the segment firms but not for the non-segment firms. Again, when the segment firms are broken down into high- and low-compliance firms, the significant increase in variability of net income relative to OCF, as well as the significant difference-in-differences between the non-segment firms and the segment firms, is confined to the high-compliance segment firms.

The third panel of table 8 compares the correlation of the proxies for accruals and OCF (residuals from Eq. (4) and (5)). While the negative correlation between accruals and OCF is similar between the segment and non-segment firms prior to the merger (-0.7497 and -0.6646, respectively), subsequent to the merger the negative correlation drops by 27% for the segment firms but increases slightly for the non-segment firms. We interpret this dramatic (and significant) attenuation of the negative correlation between accruals and OCF for the segment firms as reflecting a decrease in earnings management for the segment firms subsequent to joining the segments. The difference in differences is significant at 0.01. Once again, when the segment firms are broken down into high- and low-compliance firms, the significant decrease in negative correlation between accruals and OCF, as well as the significant difference-in-differences between the non-segment firms and the segment firms, is confined to the high-compliance segment firms.

[Insert Table 8 About Here]

In summary, the results of our analyses of the accounting quality proxies reported in Sections 4.3.1 and 4.3.2 are largely consistent with an increase in accounting quality for those firms that chose to become listed on the named segments of Euronext relative to non-segment firms. The results are especially consistent when we evaluate only those segment firms that complied more fully with the financial reporting provisions of their Commitment Agreements. We interpret these results as suggesting that the integration of trading platforms associated with transnational exchange mergers can overcome differential country-specific monitoring and enforcement mechanisms by offering firms mechanisms to make credible voluntary commitments to current and potential investors, such as the named segments offered to Euronext-listed firms. Our results are also consistent with the literature documenting the importance of firms' reporting incentives in determining the outputs of the financial reporting system.

**5. Diagnostics and Extensions**

**5.1 Propensity Score Matching**

As discussed earlier, panel C of table 2 shows that our segment and non-segment firms differ significantly on a number of firm characteristics both before and after the formation of Euronext. Among these characteristics are leverage, profitability, number of foreign exchange listings, sales growth, size, asset turnover, Big-5 auditor, IFRS or US GAAP, and return volatility. The accounting literature has demonstrated that these characteristics affect not only the reporting decisions of firms but also their decision whether to list or cross-list on a highly-regulated exchange (see Lang et al. 2003 for an example). Thus, the liquidity with which sample firms trade, and their choices to provide a certain level of reporting quality, might not be independent of their decisions to list on a named segment and our results might be influenced by selection bias. To control for such bias, we match the segment and non-segment firms on these firm characteristics to obtain a sample of non-segment firms with similar likelihood of listing on a named segment. Given the large number of independent variables which need to be matched, we expect that a simple matching procedure will result in a large loss of observations. Instead, to minimize this loss, we conduct a propensity score matching (PSM) analysis. The PSM analysis allows us to calculate a propensity score for each firm-year in our sample, as a single balanced representation of all firm characteristics of interest (Guo and Fraser 2010). This in turn guarantees that propensity score matched observations are similar on average even if they continue to differ on some firm characteristics included in the propensity score calculation.

We conduct the PSM analysis separately pre- and post-merger. Table 9 panel A shows results from the two logistic regressions used to calculate the propensity scores for our sample firms. The results of these regressions indicate that both before and after the formation of Euronext, the probability of joining a named segment is positively and significantly related to sales growth, asset turnover, being audited by a Big-5 auditor, and return variability. The probability of joining a named segment is also negatively and significantly related to leverage and being cross-listed on a U.S. exchange. We also find that only for the post-merger period, the probability of joining a named segment is positively and significantly related to reporting under US GAAP or IFRS. Using the calculated propensity scores from these logistic regressions, we perform a nearest neighbor within caliper matching of segment and non-segment firms. We keep in our PSM sample only pairs of segment and non-segment firm-years for which the absolute value of the difference in their propensity scores is no larger than 0.01. In the process of matching we lose segment and non-segment observations that fall out of the common support region of the calculated propensity scores, and are left with 474 firms and 2,446 firm-years (see panel A of table 3).

[Insert Table 9 About Here]

To evaluate whether our PSM procedure was successful in eliminating the differences in firm characteristics between the segment and non-segment samples, we recalculate the descriptive statistics by period and segment, the difference between medians and means, and the statistical significance of these differences. The comparison in table 9 panel B indicates that the PSM procedure successfully eliminated the difference in means and medians between the segment and non-segment firms for most firm characteristics. The firms in our PSM sample pre-merger differ significantly only on mean and median return variability and post-merger on median size and return variability.

Table 9 panel C reports replications of our liquidity regression analyses using the PSM sample, and shows inferences very similar to those in table 4. In particular, the coefficient on the interaction term for segment firms after the formation of Euronext is negative and significant for both the percentage of non-trading days and the logarithm of mean bid-ask spread, indicating that increases in liquidity for the segment firms were higher than those for non-segment firms using either proxy for trading liquidity. One difference between the table 9 results and those on table 4 is that the coefficient on Post-Merger for the liquidity proxy perc\_zeroret is negative and marginally significant without the control variables (negative and not significant with the control variables).

**5.2 Sensitivity of the Liquidity Results to Benchmark**

 We note that table 4 documents a systematic decrease in liquidity for Euronext-listed firms after the merger, although the segment-listed firms garnered liquidity. The difference-in-differences between the segment and non-segment firms might be driven by the significant decrease in liquidity among the non-segment firms. Therefore, one concern is the extent to which the non-segment firms are a good control for contemporaneous events. A comparison of the market value distributions for the segment vs. non-segment firms (untabulated) shows the largest firms in the right tail of the non-segment firms’ distribution, suggesting that the largest firms from the predecessor exchanges chose not to join the segments.[[37]](#footnote-37) To assess the sensitivity of our liquidity results to alternative benchmarks, we split the segment and non-segment firms into size quintiles, and found that for all five quintiles and both liquidity proxies, the segment firms experience increases in liquidity after the merger. On the other hand, for four of the five size quintiles (all except quintile 4), the non-segment firms experienced liquidity decreases after the merger, assessed using both liquidity proxies. We also re-estimated the liquidity regressions excluding the largest quintile of non-segment firms, which could arguably be global firms with multiple cross-listings and sufficient liquidity that the formation of Euronext did not make a significant difference in their shares trading. The liquidity regressions support identical inferences using either the full sample or the bottom 80% of the non-segment firm size distribution.

**5.3 Other Diagnostics and Extensions**

 We further addressed the sensitivity of the results to two features of our empirical design. First, we aggregated NextPrime and NextEconomy firms together in the category "segment firms", even though liquidity and accounting quality may vary between the two segments due to the characteristics of the firms choosing to list on each segment. To address the sensitivity of our results to differences between the segments, we repeated the analyses separately for the separate segments. The results (untabulated) are not inconsistent with the results reported in the paper, in that liquidity and accounting quality increased for both the NextEconomy and NextPrime firms from before to after the merger, though with varying statistical significance. Second, we addressed the dominance of Paris-listed firms in the sample (from table 3 panel A, 755 of the 1,058 firms in the initial sample were French), by repeating the analyses for just the Paris-listed firms. The results (untabulated) support the same inferences as those reported in the paper, and suggest that liquidity and accounting quality increased from before to after the merger for the French segment firms but not for the French non-segment firms.

Next, we compared the distribution of firms from the predecessor exchanges in the full sample, listed on NextEconomy, listed on NextPrime, included in the segment firm category, and included in the non-segment firm category (untabulated). This comparison addresses the homogeneity of firms listed on the predecessor exchanges, and the geographical composition of the segment firm category. Dutch firms are slightly over-represented on the named segments (15.91% on the segments vs. 14.36% on Euronext). This over-representation is driven by Dutch firms' presence on the NextPrime segment (22% Dutch), which was established for traditional firms. On the other hand, French firms are under-represented on the segments (70.15% on Euronext but 64.2% on the segments) and this under-representation is driven by over-representation on NextEconomy (established for high-tech firms) and under-representation on NextPrime. Portuguese firms are a very small percentage in each category, and Belgian firms are considerably over-represented on both segments.

Finally, to investigate the possibility that our segment results might be driven by the exchange sub-samples, we replicated various liquidity and accounting quality comparisons for the predecessor exchanges pre- and post-merger. The results (untabulated) are generally smaller and insignificant, suggesting that our primary empirical results cannot be explained by the changes in liquidity and accounting quality in the exchange sub-samples.

**6. Summary and Conclusions**

In this paper, we described the formation of the Euronext stock market from the predecessor exchanges in Amsterdam, Brussels, Paris, and Lisbon; the integration of the trading platform that made all Euronext-listed securities available to market participants from each of the four countries; the integration of regulation from the four exchanges; and the creation of named segments of Euronext that facilitated pre-commitments to enhanced financial reporting quality and transparency. We tested the hypotheses that (H1) liquidity increased for the Euronext-listed firms at the time of the merger; (H1A) liquidity increased more for the firms that chose to join the named segments; and (H1B) liquidity increased more for the segment firms that complied more fully with the financial reporting provisions of their Commitment Agreements. We used bid-ask spread and the percentage of days on which no trading occurred as proxies for liquidity, and found that liquidity did not increase after the merger across the sample of Euronext-listed firms, but consistent with H1A and H1B, liquidity increased for the segment firms and especially for the segment firms that complied more fully with their pre-commitments.

We also tested the hypotheses that (H2) Euronext firms increased their accounting quality at the time of the merger; (H2A) segment firms increased their accounting quality more; and (H2B) segment firms that were more fully compliant with the provisions of their Commitment Agreements also made measurement choices that increased their accounting quality. We used timely loss recognition, variability of net income relative to variability of operating cash flows, and correlation between accruals and operating cash flows as proxies for accounting quality. We found little support for hypothesis H2 (that accounting quality increased for all Euronext-listed firms at the time of the merger) and some support for H2A (that accounting quality increased at the time of the merger for segment firms). We found strong support for H2B (that accounting quality increased for high-compliance segment firms) using all three proxies for earnings quality and evaluating the increase against either the pre-merger accounting quality of the high-compliance firms (using each firm as its own control) or the change at the time of the merger for the non-segment firms (in a difference-in-differences design).

As consolidation of global capital markets continues, our results suggest that investors will be advantaged by increased liquidity with access to a more diverse investment opportunity set at low transaction cost, and particularly so if firms improve their transparency to appeal to the wider set of investors. Euronext's establishment of an elite "club" to which members could belong if they credibly precommited to enhanced financial reporting quality and corporate governance was associated with improved liquidity and accounting quality. This association suggests that integrating the merged trading platforms to facilitate deeper pools of liquidity is feasible, and that segmenting the merged exchange to allow firms to credibly bond to enhanced reporting quality and corporate governance is a solution to the problem of regulating global capital markets that no longer belong to a single jurisdiction.

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|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
| Non-segment Firms | ***Global Auditor (Percentage)*** | 65 | 65 | 65 | 66 | 65 | 69 | 68 | 77 |
| Segment Firms |  | 76 | 80 | 80 | 82 | 88 | 86 | 87 | 88 |
| NextPrime Firms |  | 78 | 81 | 80 | 83 | 92 | 87 | 89 | 89 |
| NextEconomy Firms |  | 74 | 79 | 80 | 81 | 82 | 84 | 85 | 86 |
|  |  |  |  |  |  |  |  |  |  |
| Non-segment Firms | ***Using IFRS* *(Percentage)*** | 1 | 1 | 7 | 58 | 61 | 66 | 68 | 73 |
| Segment Firms |  | 1 | 5 | 33 | 87 | 94 | 95 | 97 | 97 |
| NextPrime Firms |  | 0 | 3 | 42 | 90 | 97 | 96 | 98 | 99 |
| NextEconomy Firms |  | 3 | 8 | 22 | 82 | 89 | 88 | 90 | 88 |
|  |  |  |  |  |  |  |  |  |  |
| Non-segment Firms | ***Issuing Quarterly Reports (Percentage)*** | 9 | 8 | 10 | 14 | 17 | 22 | 23 | 37 |
| Segment Firms |  | 32 | 40 | 48 | 55 | 60 | 62 | 61 | 62 |
| NextPrime Firms |  | 19 | 23 | 25 | 32 | 35 | 37 | 37 | 39 |
| NextEconomy Firms |  | 45 | 57 | 74 | 81 | 87 | 90 | 91 | 89 |
|  |  |  |  |  |  |  |  |  |  |
| Non-segment Firms | ***Reporting in English(Percentage)*** | 8 | 7 | 9 | 11 | 13 | 15 | 18 | 25 |
| Segment Firms |  | 81 | 82 | 83 | 86 | 87 | 85 | 87 | 88 |
| NextPrime Firms |  | 91 | 92 | 91 | 91 | 91 | 91 | 92 | 93 |
| NextEconomy Firms |  | 67 | 69 | 68 | 76 | 77 | 76 | 79 | 80 |
|  |  |  |  |  |  |  |  |  |  |
| Non-segment Firms | ***Average (out of 8) Website Score*** | 1.47 | 1.77 | 2.10 | 2.44 | 2.60 | 3.15 | 3.37 | 3.77 |
| Segment Firms |  | 4.29 | 4.52 | 4.79 | 5.02 | 5.33 | 5.47 | 5.65 | 5.79 |
| NextPrime Firms |  | 4.37 | 4.46 | 4.63 | 4.86 | 5.17 | 5.28 | 5.35 | 5.59 |
| NextEconomy Firms |  | 4.18 | 4.61 | 5.01 | 5.24 | 5.54 | 5.74 | 6.21 | 6.3 |
|  |  |  |  |  |  |  |  |  |  |
| Non-segment Firms | ***Functioning Website (Percentage)*** | 59 | 65 | 69 | 73 | 77 | 91 | 92 | 89 |
| Segment Firms |  | 85 | 87 | 89 | 91 | 94 | 96 | 96 | 99 |
| NextPrime Firms |  | 88 | 89 | 90 | 92 | 95 | 96 | 96 | 99 |
| NextEconomy Firms |  | 81 | 84 | 88 | 89 | 92 | 96 | 97 | 100 |
| (continues on next page) |  |  |  |  |  |  |  |  |

 **Table 1. Comparison of selected characteristics of financial reporting, segment vs. non-segment firms**

**Table 1 (continued)**

Data are all available firm-years for sample firms listed on the NextPrime and NextEconomy segments of Euronext, plus a random sample of 150 Euronext-listed firms not included on either named segment. Sources for data on the use a global auditor (Big Five or Big Four), use of IFRS, the release of quarterly reports in any year, and the use of English as a primary or secondary reporting language are ThomsonOne filings and company websites. The Website Score is from Frost, Gordon, and Pownall (2010), and the source of data on websites comes from current websites for each sample firm and from the Internet Archive Wayback Machine available at http://www.archive.org/web/web.php for previous years' websites. The Website Score is a disclosure categorical variable taking on the following values:

 0: Firm has no website;

 1: A domestic language-only website is available;

 2: An English version of the website is available;

 3: The English version apparently mirrors (in form and content) the domestic language version;

 4: The website provides an investor relations page;

 5: The website provides current financial statements;

 6: The website provides prior years’ annual financial statements;

 7: The website provides press releases;

 8: The website provides conference calls.

Percentage of firms with Functioning Website is the percentage of firms in each category that have values of 1 or more on the WebsiteScore.

**Table 2. Variable definitions and data sources**

|  |  |  |
| --- | --- | --- |
| **Variable**  | **Definition**  | **Source**  |
| Accruals\_Assets | = Total Accruals/Total Assets | Worldscope |
| afterdrop\_beforeadd | = an indicator variable for the period after firms dropped from the segments or before firms were added to the segments (after the  segments were formed) | Euronext\* |
| Auditor | = dummy variable equal to 1 if the company has a Big-5  auditor and 0 otherwise | Worldscope & financial reports |
| Compl4 | = average of dummy variables indicating whether (1) company uses USGAAP/IFRS; (2) provides financial reports in English; (3) is audited by a Big-5auditor; and (4) has a fully functioning website | Hand-collected &Worldscope |
| Compl5 | = average of dummy variables indicating whether (1) company uses USGAAP/IFRS; (2) provides financial reports in English; (3) is audited by a Big-5 auditor; (4) has a fully functioning website; and (5) reports quarterly | Hand-collected &Worldscope |
| English | = dummy variable equal to 1 if the company provides financial reports in English | Hand-collected |
| # FExchanges  | = the number of foreign exchanges on which the company is listed  | Worldscope  |
| IFRS\_USGAAP | = dummy variable equal to 1 if the company has adopted USGAAP or IFRS  accounting standards and 0 otherwise | Worldscope |
| Leverage  | = Total Liabilities/Total Assets  | Worldscope  |
| log\_mn\_bidask | = a natural logarithm of the mean bid-ask spread for a company in year t, calculated using the formula (AskPrice – BidPrice)/((AskPrice+BidPrice)/2) | Datastream |
| NI\_Assets | = Net Income/Total Assets | Worldscope |
| NegRet | = dummy variable equal to 1 if annual return is less than zero, and zero otherwise | Datastream |
| Non-segment | = dummy variable equal to 1 if a company is not included in the NextPrime or NextEconomy segments during any year of the sample period | Euronext\* |
| OCF\_Assets | = Operating Cash Flows/Total Assets | Worldscope |
| perc\_zeroret | = percentage of trading days with zero returns in year t | Datastream |
| Post-Merger | = dummy variable equal to 1 for the year in which the exchange joins Euronext and all the years thereafter¥  | n/a  |
| Qtrly | = dummy variable equal to 1 if the company provides quarterly financial reports | Hand-collected |
| ret\_std | = standard deviation of daily stock returns at year t | Datastream |
| Return | = (Stock Price at the end of year t + Dividends for year t–Stock Price at the beginning of year t)/ Stock Price at the beginning of year t | Datastream |
| Sales Growth | = (Sales at year t – Sales at year t-1) / Sales at year t | Worldscope |
| Segment  | = dummy variable equal to 1 if a company is included in the NextPrime or NextEconomy segments during any year of the sample period  | Euronext\*  |
| Size | = the logarithm of year-end Market Value | Worldscope |
| Turn | = Sales at year t / Total Assets at year t | Worldscope |
| USCROSSLISTED | = dummy variable equal to 1 if the company is cross-listed on the NYSE, NASDAQ or AMEX and 0 otherwise | ADR Databases+ |
| Website | = dummy variable equal to 1 if the company has a functional website | Hand-collected |
| ¥This year is 2002 for Paris, Brussels, and Amsterdam, and 2004 for Lisbon\*Euronext is http://www.euronext.com/editorial/wide/editorial-20773-EN.html + ADR databases are the ADR database of J.P. Morgan, Bank of NY Melon, and Citigroup  |

**Table 3: Sample selection and descriptive statistics**

**Panel A: Sample selection**

|  |  |  |
| --- | --- | --- |
| **Sample** | **Firm-Year** | **Firm** |
| Firms with observations in Datastream and WorldScope 1993–2007 including: | **8,622** | **1,058** |
| Amsterdam | 1,064 | 124 |
| Brussels | 986 | 127 |
| Paris | 6,076 | 755 |
| Lisbon | 496 | 52 |
| After requiring non-missing NI, OCF, Accrual and control variables | **6,023** |  **802** |
|  |  |  |
| After truncating liquidity, return, earnings, accruals/assets,OCF\_Assets and other control variables at 0.5% and 99.5% |  **5,562** |  **778** |
|  |  |  |
| After requiring a balanced sample | **4,856** | **529** |
|  |  |  |
| After propensity score matching in pre-merger and post-merger periods | **2,446** | **474** |

**Panel B: Descriptive statistics, full sample**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **N** | **Q1** | **Median** | **Q3** | **Mean** | **StdDev** |
| Return | 4,856 | -0.1112 | 0.1423 | 0.4388 | 0.3868 | 1.2499 |
| NI\_Assets | 4,856 | 0.0096 | 0.0345 | 0.0627 | 0.0270 | 0.0838 |
| OCF\_Assets | 4,856 | 0.0257 | 0.0741 | 0.1219 | 0.0730 | 0.0966 |
| Accruals\_Assets | 4,856 | -0.0826 | -0.0420 | -0.0010 | -0.0460 | 0.0895 |
| mn\_bidask | 4,856 |  -0.0074 | 0.0155 | 0.0326 | 0.0306 | 0.0474 |
| perc\_zeroret | 4,856 | 0.0536 | 0.1418 | 0.4885 | 0.2931 | 0.3128 |
| Size | 4,856 | 3.7604 | 5.1910 | 6.8594 | 5.3850 | 2.1958 |
| Sales Growth | 4,856 | -0.0150 | 0.1206 | 0.2338 | 0.1443 | 0.3107 |
| Leverage | 4,856 | 0.4939 | 0.6192 | 0.7310 | 0.6070 | 0.1860 |
| Turn | 4,856 | 0.7712 | 1.0837 | 1.4183 | 1.1602 | 0.6040 |
| Auditor | 4,856 | 0.0000 | 1.0000 | 1.0000 | 0.5344 | 0.4989 |
| USCROSSLISTED | 4,856 | 0.0000 | 0.0000 | 0.0000 | 0.0150 | 0.1217 |
| IFRS\_USGAAP | 4,856 | 0.0000 | 0.0000 | 1.0000 | 0.2864 | 0.4521 |
| #FExchange | 4,856 | 0.0000 | 0.0000 | 0.0000 | 0.2201 | 0.7742 |
| ret\_std | 4,856 | 0.0129 | 0.0176 | 0.0241 | 0.0201 | 0.0166 |

(continues on next page)

**Table 3 (continued)**

**Panel C: Descriptive statistics by pre-/post-merger and segment/non-segment partitions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Pre-merger** |  |  |  |  |
|  | **Non-segment** | **Segment** |
|  | **N** | **Mean** | **Median** | **StdDev** | **N** | **Mean** | **Median** | **StdDev** |
| Return | 1,570 | 0.3275 | 0.0194 | 1.3903 | 485 |  0.4990\* |  0.0085 | 1.8450 |
| NI\_Assets | 1,570 | 0.0284 | 0.0309 | 0.0741 | 485 |  0.0311 |  0.0390\*\*\* | 0.0698 |
| OCF\_Assets | 1,570 | 0.0807 | 0.0800 | 0.0896 | 485 |  0.0718\* |  0.0735\* | 0.0979 |
| Accruals\_Assets | 1,570 | -0.0523 | -0.0489 | 0.0810 | 485 |  -0.0407\*\* |  -0.0392\*\*\* | 0.0947 |
| mn\_bidask | 1.570 | 0.0319 | 0.0180 | 0.0440 | 485 |  0.0192\*\*\* |  0.0160\*\*\* | 0.0210 |
| perc\_zeroret | 1,570 | 0.3175 | 0.1456 | 0.3330 | 485 |  0.1814\*\*\* |  0.1154\*\*\* | 0.1873 |
| Size | 1,570 | 5.5003 | 5.3360 | 2.4296 | 485 | 5.3212\*\* |  5.2548 | 1.3123 |
| Sales Growth | 1,570 | 0.0962 | 0.0510 | 0.2758 | 485 |  0.1684\*\*\* |  0.1043\*\*\* | 0.3259 |
| Leverage | 1,570 | 0.6204 | 0.6310 | 0.1653 | 485 |  0.5840\*\*\* |  0.6010\*\*\* | 0.1806 |
| Turn | 1,570 | 1.1273 | 1.0677 | 0.5854 | 485 |  1.1968\*\* |  1.1563\*\* | 0.6333 |
| Auditor | 1,570 | 0.5369 | 1.0000 | 0.4988 | 485 |  0.6474\*\*\* |  1.0000\*\*\* | 0.4783 |
| USGAAP\_IFRS | 1,570 | 0.0242 | 0.0000 | 0.1537 | 485 |  0.0124\* |  0.0000 | 0.1106 |
| USCROSSLISTED | 1,570 | 0.0204 | 0.0000 | 0.1413 | 485 |  0.0021\*\*\* |  0.0000\*\*\* | 0.0454 |
| # FExchanges | 1,570 | 0.2688 | 0.0000 | 0.8921 | 485 |  0.2082 |  0.0000 | 0.7357 |
| ret\_std | 1,570 | 0.0205 | 0.0182 | 0.0207 | 485 |  0.0245\*\*\* |  0.0210\*\*\* | 0.0135 |
|  |  |  |  |  |

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**Table 3 (continued)**

**Panel C: Descriptive statistics by pre-/post-merger and segment/non-segment partitions (Continued)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Post-merger** |  |  |  |  |
|  | **Non-segment** | **Segment** |
|  | **N** | **Mean** | **Median** | **StdDev** | **N** | **Mean** | **Median** | **StdDev** |
| Return | 1,969 | 0.3848 | 0.2186 | 0.9841 | 832 |  0.4380 |  0.2298 | 1.0885 |
| NI\_Assets | 1,969 | 0.0253 | 0.0343 | 0.0861 | 832 |  0.0263 |  0.0396\*\* | 0.1012 |
| OCF\_Assets | 1,969 | 0.0702 | 0.0709 | 0.0977 | 832 |  0.0658 |  0.0694 | 0.1050 |
| Accruals\_Assets | 1,969 | -0.0449 | -0.0408 | 0.0911 | 832 |  -0.0395 | -0.0333\*\* | 0.0969 |
| mn\_bidask | 1,969 | 0.0387 | 0.0172 | 0.0601 | 832 |  0.0157\*\*\* | 0.0117\*\*\* | 0.0145 |
| perc\_zeroret | 1,969 | 0.3644 | 0.2000 | 0.3457 | 832 |  0.1437\*\*\* | 0.1115\*\*\* | 0.1268 |
| Size | 1,969 | 5.3395 | 5.0019 | 2.3962 | 832 |  5.3127 |  5.2469\* | 1.5446 |
| Sales Growth | 1,969 | 0.1532 | 0.1484 | 0.3102 | 832 |  0.1999\*\*\* | 0.1715\*\*\* | 0.3503 |
| Leverage | 1,969 | 0.6101 | 0.6209 | 0.2019 | 832 |  0.5878\*\*\* | 0.6072\*\*\* | 0.1841 |
| Turn | 1,969 | 1.1543 | 1.0684 | 0.5942 | 832 | 1.2148\*\* |  1.1185\*\* | 0.6395 |
| Auditor | 1,969 | 0.4830 | 0.0000 | 0.4998 | 832 |  0.5853\*\*\* |  1.0000\*\*\* | 0.4930 |
| IFRS\_USGAAP | 1,969 | 0.4749 | 0.0000 | 0.4995 | 832 |  0.4952 |  0.0000 | 0.5003 |
| USCROSSLISTED | 1,969 | 0.0173 | 0.0000 | 0.1303 | 832 | 0.0072\*\* |  0.0000\*\* | 0.0847 |
| # FExchanges | 1,969 | 0.2016 | 0.0000 | 0.7287 | 832 |  0.1791 |  0.0000 | 0.6474 |
| ret\_std | 1,969 | 0.0180 | 0.0159 | 0.0150 | 832 |  0.0217\*\*\* | 0.0181\*\*\* | 0.0114 |

The table provides the sample selection procedure and descriptive statistics for the variables included in the analysis. Panel A shows the sample selection procedure. Panel B shows the values for the mean, median, standard deviation, 1st and 3rd quartile for a number of characteristics of the firm-year observations included in our full sample. Finally, Panel C of the table provides data on the same characteristics for firm-year observations split by segment and calculated separately for the pre- and post-merger period. Panel C also shows a comparison between the means and medians of the firm characteristics based on a t-test and a Wilcoxon rank-sum test, respectively. \*\*\* indicates statistical significance at the 0.01 level, \*\* indicates statistical significance at the 0.05 level, and \* indicates statistical significance at the 0.10 level. All variables are as defined in table 2 of the paper.

**Table 4. Liquidity regression results**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) | (6) |
|  | Perc\_zeroret | Perc\_zeroret | Perc\_zeroret | log\_mn\_bidask | log\_mn\_bidask | log\_mn\_bidask |
| Post-Merger |  0.043\*\*\* |  0.044\*\*\* |  0.043\*\*\* |  0.521\*\*\* | -0.003 | -0.004 |
|  | (3.51) | (4.27) | (4.24) | (4.93) | (0.10) | (0.13) |
|  |  |  |  |  |  |  |
| Segment |  -0.141\*\*\* |  -0.137\*\*\* |  -0.138\*\*\* |  -0.198\*\* |  -0.219\*\*\* |  -0.219\*\*\* |
|  | (6.05) | (7.27) | (7.29) | (2.49) | (3.86) | (3.84) |
|  |  |  |  |  |  |  |
| Post- |  -0.076\*\*\* |  -0.060\*\*\* |  -0.070\*\*\* |  -0.157\*\* |  -0.102\* |  -0.113\*\* |
| Merger\*Segment | (4.16) | (4.00) | (4.61) | (2.24) | (1.84) | (2.00) |
|  |  |  |  |  |  |  |
| Leverage |  |  0.080\* | 0.076 |  |  0.680\*\*\* |  0.677\*\*\* |
|  |  | (1.73) | (1.64) |  | (5.16) | (5.07) |
|  |  |  |  |  |  |  |
| NI\_Assets |  |  -0.233\*\* |  -0.243\*\* |  |  -1.165\*\*\* |  -1.180\*\*\* |
|  |  | (2.20) | (2.29) |  | (4.30) | (4.26) |
|  |  |  |  |  |  |  |
| #FExchanges |  | 0.010 | 0.009 |  | -0.037 | -0.039 |
|  |  | (1.16) | (1.06) |  | (1.05) | (1.09) |
|  |  |  |  |  |  |  |
| Sales Growth |  |  -0.023\* | -0.025\* |  | -0.017 | -0.023 |
|  |  | (1.75) | (1.88) |  | (0.35) | (0.46) |
|  |  |  |  |  |  |  |
| Size |  |  -0.085\*\*\* |  -0.085\*\*\* |  |  -0.429\*\*\* |  -0.429\*\*\* |
|  |  | (17.68) | (17.62) |  | (25.47) | (25.38) |
|  |  |  |  |  |  |  |
| Auditor |  |  -0.049\*\* |  -0.050\*\* |  |  -0.135\*\* |  -0.136\*\* |
|  |  | (2.35) | (2.38) |  | (2.09) | (2.09) |
|  |  |  |  |  |  |  |
| IFRS\_USGAAP |  |  -0.059\*\*\* |  -0.058\*\*\* |  |  -0.385\*\*\* |  -0.383\*\*\* |
|  |  | (6.12) | (5.98) |  | (14.22) | (13.92) |
|  |  |  |  |  |  |  |
| USCROSSLISTED |  | 0.004 | 0.008 |  |  -0.250\*\* |  -0.244\* |
|  |  | (0.14) | (0.25) |  | (1.99) | (1.93) |
|  |  |  |  |  |  |  |
| ret\_std |  |  -4.769\*\* |  -4.743\*\* |  | -2.096 | -2.077 |
|  |  | (2.53) | (2.52) |  | (1.60) | (1.59) |
|  |  |  |  |  |  |  |
| afterdrop\_beforeadd |  |  |  0.088\*\*\* |  |  | 0.099 |
|  |  |  | (3.13) |  |  | (1.16) |
|  |  |  |  |  |  |  |
| Constant |  0.224\*\*\* |  0.885\*\*\* |  0.886\*\*\* |  -4.726\*\*\* |  -1.765\*\*\* |  -1.762\*\*\* |
|  | (7.86) | (15.74) | (15.75) | (34.58) | (14.15) | (14.05) |
|  |  |  |  |  |  |  |
| Country FE | Yes | Yes | Yes | Yes | Yea | Yes |
| Industry FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 4,856 | 4,856 | 4,815 | 4,856 | 4,856 | 4,815 |
| Adjusted R-squared | 0.13 | 0.49 | 0.49 | 0.11 | 0.64 | 0.64 |

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**Table 4 (continued)**

The table shows the results from OLS regressions:

perc\_zeroret (log\_mn\_bidask) = β0 + β1\*Segment + β2\*Post+ β3\*Post-Merger\*Segment

(for models 1 and 4);

perc\_zeroret (log\_mn\_bidask) = β0 + β1\*Segment + β2\*Post+ β3\*Post-Merger\*Segment

+ Σβi\*Control Variables (for model 2 and 5);

perc\_zeroret (log\_mn\_bidask) = β0 +β1\*Segment+ β2\*Post+ β3\*Post\*Segment

+ β4\* afterdrop\_beforeadd *+*  Σβi\*Control Variables (for model 3 and 6); and

All variables are as defined in table 2 of the paper. The regressions include both country and industry fixed effects, and standard errors are clustered by firm.

\*\*\* indicates statistical significance at the 0.01 level, \*\* indicates statistical significance at the 0.05 level, and \* indicates statistical significance at the 0.10 level (two-tailed test).

**Table 5: Liquidity changes and compliance with segment requirements**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) | (6) |
|  | Perc\_zeroret | Perc\_zeroret | Perc\_zeroret | log\_mn\_bidask | log\_mn\_bidask | log\_mn\_bidask |
| Post-Merger | -0.047\* | -0.033 | -0.020 | -0.114 | -0.027 | 0.100 |
|  | (1.84) | (1.26) | (0.79) | (1.35) | (0.32) | (1.22) |
| Compl5 |  -0.015\*\* |  |  | -0.019 |  |  |
|  | (2.55) |  |  | (0.94) |  |  |
| Post-Merger\*Compl5 |  -0.002 |  |  |  -0.055\*\* |  |  |
|  | (0.28) |  |  | (2.27) |  |  |
| Compl4 |  | 0.000 |  |  |  0.080\*\*\* |  |
|  |  | (0.06) |  |  | (3.43) |  |
| Post-Merger\*Compl4 |  | -0.010 |  |  |  -0.094\*\*\* |  |
|  |  | (1.35) |  |  | (3.45) |  |
| Qtrly |  |  -0.068\*\*\* |  -0.060\*\*\* |  |  -0.358\*\*\* |  -0.342\*\*\* |
|  |  | (4.75) | (4.02) |  | (7.00) | (6.40) |
| Post-Merger\*Qtrly |  | 0.029\* |  0.030\* |  | 0.081 | 0.112\* |
|  |  | (1.86) | (1.81) |  | (1.29) | (1.74) |
| IFRS\_USGAAP |  |  | 0.038 |  |  | -0.023 |
|  |  |  | (1.64) |  |  | (0.15) |
| Post-Merger\*IFRS\_USGAAP |  |  |  -0.098\*\*\* |  |  |  -0.392\*\* |
|  |  |  | (3.84) |  |  | (2.47) |
| Auditor |  |  | -0.017 |  |  | -0.039 |
|  |  |  | (0.93) |  |  | (0.74) |
| Post-Merger\*Auditor |  |  | 0.030 |  |  | 0.089 |
|  |  |  | (1.51) |  |  | (1.45) |
| English |  |  | 0.002 |  |  | 0.094 |
|  |  |  | (0.09) |  |  | (1.40) |
| Post-Merger\*English |  |  | -0.033 |  |  |  -0.175\*\* |
|  |  |  | (1.43) |  |  | (2.23) |
| Website |  |  | -0.010 |  |  |  0.172\*\*\* |
|  |  |  | (0.63) |  |  | (3.25) |
| Post-Merger\*Website |  |  | -0.014 |  |  |  -0.239\*\*\* |
|  |  |  | (0.77) |  |  | (3.83) |
| Leverage |  0.074\*\*\* |  0.079\*\*\* |  0.065\*\*\* |  0.390\*\*\* |  0.431\*\*\* |  0.366\*\*\* |
|  | (3.15) | (3.36) | (2.81) | (4.00) | (4.43) | (3.95) |
| NI\_Assets |  -0.260\*\*\* |  -0.253\*\*\* |  -0.236\*\*\* |  -0.991\*\*\* |  -0.955\*\*\* |  -0.815\*\*\* |
|  | (4.78) | (4.68) | (4.60) | (4.17) | (4.01) | (3.88) |
| #FExchanges | 0.005 | 0.006 | 0.005 | 0.012 | 0.019 | 0.019 |
|  | (0.84) | (1.00) | (0.92) | (0.41) | (0.63) | (0.67) |
| Sales Growth | -0.000 | 0.005 | 0.001 | -0.105\* | -0.069 | -0.094 |
|  | (0.03) | (0.46) | (0.11) | (1.82) | (1.19) | (1.62) |
| Size |  -0.047\*\*\* |  -0.052\*\*\* |  -0.049\*\*\* |  -0.315\*\*\* |  -0.353\*\*\* |  -0.340\*\*\* |
|  | (14.20) | (14.77) | (13.48) | (19.96) | (21.13) | (21.07) |
| USCROSSLISTED | -0.058\* | -0.059\* | -0.035 | -0.498\* | -0.494\* | -0.275 |
|  | (1.80) | (1.77) | (1.18) | (1.73) | (1.72) | (0.96) |
| ret\_std |  -4.822\*\*\* |  -4.503\*\*\* |  -5.010\*\*\* |  7.240\*\*\* |  9.421\*\*\* |  6.365\*\*\* |
|  | (7.92) | (7.49) | (7.66) | (3.76) | (4.85) | (3.31) |
| Constant |  0.592\*\*\* |  0.589\*\*\* |  0.603\*\*\* |  -2.626\*\*\* |  -2.629\*\*\* |  -2.515\*\*\* |
|  | (15.15) | (15.08) | (15.34) | (19.45) | (19.38) | (18.89) |
|  |  |  |  |  |  |  |
| Observations | 1,317 | 1,317 | 1,317 | 1,317 | 1,317 | 1,317 |
| Adjusted R-squared | 0.26 | 0.27 | 0.29 | 0.52 | 0.55 | 0.59 |

(continues on next page)

**Table 5 (continued)**

The table shows the results from OLS regressions, run on the segment firms only:

perc\_zeroret (log\_mn\_bidask) = β0 + β1\*Post-Merger+ β2\*Compl5+ β3\*Post-Merger\*Compl5 *+* Σβi\*Control Variables (for models 1 and 4);

perc\_zeroret (log\_mn\_bidask) = β0 + β1\*Post-Merger + β2\*Compl4 + β3\*Post-Merger\*Compl4 +β4\*Qtrly\_dum +β5\*Post-Merger\*Qtrly\_dum + Σβi\*Control Variables (for models 2 and

 5); and

perc\_zeroret (log\_mn\_bidask) = β0 + β1\*Post-Merger+ Σβi\*Individual\_Compliance\_Var

 + Σβj\*Post-Merger\*Individual\_Compliance\_Var *+* Σβk\*Control Variables (for models 3 and 6).

The variables in these models are as defined in table 2.

\*\*\* indicates statistical significance at the 0.01 level, \*\* indicates statistical significance at the 0.05 level, and \* indicates statistical significance at the 0.10 level (two-tailed test).

**Table 6: Timely loss recognition results by pre-/post- merger and segment/non-segment partitions**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **(1)** | **(2)** | **(3)** |  | **(4)** | **(5)** | **(6)** |  | **(7)** | **(8)** | **(9)** |
|  | **NonSeg Firms** | **Segment Firms** | **Diff.****Seg/****NonSeg** |  | **NonSeg Firms** | **LowCompl Segment Firms** | **Diff.****NonSeg/****LowCompl** |  | **NonSeg Firms** | **HighCompl Segment Firms** | **Diff.****NonSeg/****HighCompl** |
| Return |  0.001 |  0.001 |  |  |  0.001 | -0.002 |  |  | 0.001 | 0.002 |  |
|  |  (1.21) |  (0.26) |  |  |  (1.21) |  (0.41) |  |  | (1.21) | (0.71) |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| NegRet |  0.005 |  0.010 |  |  |  0.005 |  0.028 |  |  | 0.005 | 0.001 |  |
|  |  (1.25) |  (1.10) |  |  |  (1.25) |  (1.31) |  |  | (1.25) | (0.15) |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| NegRet\*Return |  0.096\*\*\* |  0.127\*\*\* |  |  |  0.096\*\*\* |  0.189\*\*\* |  |  |  0.096\*\*\* |  0.084\*\*\* |  |
|  |  (7.73) |  (6.12) |  |  |  (7.73) |  (4.83) |  |  | (7.73) | (3.33) |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Post-Merger |  -0.003 |  -0.008 |  |  |  -0.003 |  -0.011 |  |  | -0.003 | -0.006 |  |
|  |  (0.88) |  (1.28) |  |  |  (0.88) |  (0.81) |  |  | (0.88) | (0.95) |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Post-Merger\*Return |  0.001 |  0.006\* |  |  |  0.001 |  0.006 |  |  | 0.001 | 0.005 |  |
|  |  (0.47) |  (1.85) |  |  |  (0.47) |  (0.82) |  |  | (0.47) | (1.61) |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Post-Merger\*NegRet |  -0.011\* |  0.002 |  |  |  -0.011\* |  -0.018 |  |  | -0.011\* | 0.009 |  |
|  |  (1.70) |  (0.13) |  |  |  (1.70) |  (0.68) |  |  | (1.70) | (0.67) |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Post-Merger\*NegRet |  0.032\* |  0.075\*\*\* | 0.044 |  |  0.032\* |  0.031 | -0.001 |  | 0.032\* |  0.100\*\*\* | 0.069\* |
| \*Return |  (1.71) |  (2.64) | (1.35) |  |  (1.71) |  (0.59) | (0.02) |  | (1.71) | (2.80) | (1.74) |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Constant |  0.036\*\*\* |  0.044\*\*\* |  |  |  0.036\*\*\* |  0.054\*\*\* |  |  |  0.036\*\*\* |  0.039\*\*\* |  |
|  |  (15.23) |  (8.60) |  |  |  (15.23) |  (4.59) |  |  | (15.23) | (7.31) |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Observations |  3,539 | 1,317 |  |  |  3,539 | 429 |  |  | 3,539 | 888 |  |
| Adjusted R2 |  0.48 | 0.47 |  |  |  0.48 | 0.36 |  |  | 0.48 | 0.53 |  |

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**Table 6 (continued)**

The table includes results from the following OLS regression:

NI\_Assets = β0Return + β1NegRet + β2Return\*NegRet + β3Post + β4Post-Merger\*Return + β5Post-Merger\*NegRet

 + β6Post-Merger\*Return\*NegRet + ε

Variables are defined in table 2, and the regressions include firm fixed effects.

The table also includes a comparison of the coefficient of interest, i.e. the coefficient on the interaction Post-Merger\*Return\*NegRet, between the samples of segment and non-segment firms (column 3), non-segment and low-compliance segment firms (column 6), and non-segment and high-compliance segment firms (column 9). Statistical tests on the differences in the coefficients on the triple interaction term are t-tests computed by running stacked regressions in which the first of each pair of models is run after adding an interaction between each term in the model and Segment (column 2), Low-Compliance Segment (column 5), or High-Compliance Segment (column 8) designations. \*\*\* indicates statistical significance at the 0.01 level, \*\* indicates statistical significance at the 0.05 level, and \* indicates statistical significance at the 0.10 level (two-tailed test).

**Table 7. Regression results for analyses using other accounting quality proxies**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **(1)** | **(2)** | **(3)** |
|  | **NI\_Assets** | **OCF\_Assets** | **Accrual\_Assets** |
| Size |  0.010\*\*\* |  0.008\*\*\* |  0.005\*\*\* |
|  | (11.74) | (7.89) | (5.25) |
|  |  |  |  |
| Sales Growth |  0.033\*\*\* |  -0.041\*\*\* |  0.058\*\*\* |
|  | (5.56) | (6.00) | (8.67) |
|  |  |  |  |
| Leverage |  -0.121\*\*\* |  -0.115\*\*\* |  -0.050\*\*\* |
|  | (9.85) | (8.27) | (4.75) |
|  |  |  |  |
| Turn |  0.017\*\*\* |  0.025\*\*\* | 0.001 |
|  | (4.90) | (5.85) | (0.40) |
|  |  |  |  |
| OCF\_Assets |  0.376\*\*\* |  |  |
|  | (11.55) |  |  |
|  |  |  |  |
| Auditor | -0.008\*\* | 0.003 | -0.010\*\* |
|  | (2.13) | (0.69) | (2.52) |
|  |  |  |  |
| USCROSSLISTED |  -0.035\*\* |  -0.046\*\* | -0.006 |
|  | (2.04) | (2.00) | (0.55) |
|  |  |  |  |
| #FExchanges |  -0.005\*\*\* | -0.002 |  -0.003\*\* |
|  | (3.00) | (0.95) | (2.20) |
|  |  |  |  |
| Constant | -0.000 |  0.072\*\*\* |  -0.045\*\*\* |
|  | (0.01) | (5.26) | (3.74) |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| Industry FE | Yes | Yes | Yes |
| Exchange FE | Yes | Yes | Yes |
| Observations | 4,856 | 4,856 | 4,856 |
| Adjusted R-squared | 0.41 | 0.11 | 0.07 |

This table presents results from the regressions used to estimate proxies for earnings, cash flows, and accruals. The proxy for earnings is the residuals from the pooled regression: *NI\_Assets = f (Size, Sales Growth, OCF/Assets, Leverage, Turn, Auditor, USCROSSLISTED, # of Foreign Exchanges)*; the proxy for cash flows is the residuals from the pooled regression: *OCF\_Assets = f* (*Size, Sales Growth, Leverage, Turn, Auditor, USCROSSLISTED, # of Foreign Exchanges*); and the proxy for accruals is the residuals from the pooled regression: *Accruals\_Assets = f (Size, Sales Growth, Leverage, Turn, Auditor, USCROSSLISTED, # of Foreign Exchanges)*. \*\*\* indicates statistical significance at the 0.01 level, \*\* indicates statistical significance at the 0.05 level, and \* indicates statistical significance at the 0.10 level (two-tailed test).

**Table 8: Change in accounting quality**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  **Measure** | **Sign of the dif. if AQ higher** |  | **Pre-Merger** | **Post-Merger** | **Difference** **(post-pre)** | **Difference in differences** |
|  StdDev of NI | **+** | Non-Segment | 0.0583 | 0.0633 | 0.0050 |  0.0120 |
| Segment | 0.0613 | 0.0783 |  0.0170\*\* |
|  |  |  |  |  |
| Non-Segment | 0.0583 | 0.0633 | 0.0050 |  0.0027 |
| SegmentLowCompl | 0.0739 | 0.0816 | 0.0077 |
|  |  |  |  |  |
| Non-Segment | 0.0583 | 0.0633 | 0.0050 |  0.0154 |
| SegmentHighCompl | 0.0558 | 0.0762 |  0.0204\*\* |
|  |  |  |  |  |  |  |
| StdDev of NI/StdDev of OCF | **+** | Non-Segment | 0.6858 | 0.6944 |  0.0086 |  0.1387\* |
| Segment | 0.6454 | 0.7927 |  0.1473\*\* |
|  |  |  |  |  |
| Non-Segment | 0.6858 | 0.6944 |  0.0086 |  0.1023 |
| SegmentLowCompl | 0.7055 | 0.8164 | 0.1109 |
|  |  |  |  |  |
| Non-Segment | 0.6858 | 0.6944 |  0.0086 |  0.1602\* |
| SegmentHighCompl | 0.6127 | 0.7815 |  0.1688\*\* |
|  |  |  |  |  |  |  |
| Correlation ofAccruals and OCF | **+** | Non-Segment | -0.6646 | -0.6900 | -0.0254 |  0.2246\*\*\* |
| Segment | -0.7497 | -0.5505 |  0.1992\*\*\* |
|  |  |  |  |  |
| Non-Segment | -0.6646 | -0.6900 | -0.0254 |  0.1138 |
| SegmentLowCompl | -0.7278 |  -0.6394 | 0.0884 |
|  |  |  |  |  |
| Non-Segment | -0.6646 | -0.6900 | -0.0254 |  0.2921\*\*\* |
| SegmentHighCompl | -0.7626 |  -0.4959 |  0.2667\*\*\* 0.2667\*\*\* |

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**Table 8 (continued)**

Table 8 includes a comparison between the measures of accounting quality for segment and non-segment companies, non-segment and segment high-complier companies and non-segment and segment low-complier companies in the pre- and post-merger periods. In it, NI, OCF, and Accruals are the residuals from models *NI\_Assets = f (Size, Sales Growth, OCF/Assets, Leverage, Turn, Auditor, USCROSSLISTED, # of Foreign Exchanges)*, *OCF\_Assets = f* (*Size, Sales Growth, Leverage, Turn, Auditor, USCROSSLISTED, # of Foreign Exchanges*), and *Accruals\_Assets = f* (*Size, Sales Growth, Leverage, Turn, Auditor, USCROSSLISTED, # of Foreign Exchanges*), respectively. The statistical significance of the differences and difference-in-differences is calculated using the bootstrapping procedures described in the paper.

\*\*\* indicates statistical significance at the 0.01 level, \*\* indicates statistical significance at the 0.05 level, and \* indicates statistical significance at the 0.10 level (two-tailed test).

**Table 9. PSM Analyses**

**Panel A:logit regression results**

|  |  |  |
| --- | --- | --- |
|  | (1) Pre-Merger | (2) Post-Merger |
| Leverage |  -1.796\*\*\* |  -1.132\*\*\* |
|  | (-4.93) | ( -4.33) |
| NI\_Assets | -0.093 | 0.274 |
|  | (-0.12) | (0.47) |
| #FExchange | 0.008 | 0.006 |
|  | (0.10) | (0.09) |
| Sales Growth |  0.711\*\*\* |  0.373\*\*\* |
|  | (3.91) | (2.82) |
| Size | -0.025 | 0.027 |
|  | (-0.80) | (1.06) |
| Turn |  0.211\* |  0.197\*\* |
|  | (1.94) | (2.41) |
| Auditor |  0.612\*\*\* |  0.444\*\*\* |
|  | (4.75) | (4.37) |
| IFRS\_USGAAP | -0.467 |  0.200\*\* |
|  | (-0.94) | (2.15) |
| USCROSSLISTED |  -2.021\* |  -1.340\*\*\* |
|  | (-1.90) | (-2.69) |
| ret\_std |  8.889\*\*\* |  27.145\*\*\*  |
|  | (2.70) | (6.01) |
| Const. |  -17.685\*\*\* |  -18.226\*\*\* |
|  | (-45.36) | (-39.38) |
| Industry FE | Yes | Yes |
| Exchange FE | Yes |  Yes |
| Observations | 2,040 |  2,785  |
| Pseudo R-squared | 0.1047 | 0.0868 |

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**Table 9 Panel A (continued)**

The panel shows results from two logistic models used to estimate the propensity of firms in our sample to list on a named segment. Model 1 calculates this propensity using firm-year observations from the pre-merger period, while Model 2 uses firm-year observations from the post-merger period. \*\*\* indicates statistical significance at the 0.01 level, \*\* indicates statistical significance at the 0.05 level, and \* indicates statistical significance at the 0.10 level. All variables are as defined on Table 2 of the paper.

**Panel B: PSM sample descriptive statsistics by pre-/post-merger and segment/non-segment partitions**

|  |  |
| --- | --- |
|  **Pre-merger** |  |
|  | **Non-segment** | **Segment** |
|  | **N** | **Mean** | **Median** | **StdDev** | **Mean** | **Median** |  **StdDev StdDev**  |
| Size | 446 | 5.4139 | 5.2078 | 2.2858 | 5.2796 |  5.2154 |  1.2933 |
| NI\_Assets | 446 | 0.0361 | 0.0358 | 0.0809 | 0.0316 | 0.0376 | 0.0673 |
| Sales Growth | 446 | 0.1576 | 0.0676 | 0.3519 | 0.1562 | 0.1035 | 0.2858 |
| Leverage | 446 | 0.5863 | 0.5903 | 0.1737 | 0.5900 | 0.6060 | 0.1798 |
| Turn | 446 | 1.2213 | 1.0928 | 0.6582 | 1.1979 | 1.1643 | 0.6277 |
| Auditor | 446 | 0.6435 | 1.0000 | 0.4795 | 0.6278 | 1.0000 | 0.4839 |
| USGAAP\_IFRS | 446 | 0.0112 | 0.0000 | 0.1054 | 0.0135 | 0.0000 | 0.1153 |
| USCROSSLISTED | 446 | 0.0000 | 0.0000 | 0.0000 | 0.0022 | 0.0000 | 0.0474 |
| # FExchanges | 446 | 0.1682 | 0.0000 | 0.6575 | 0.2175 | 0.0000 | 0.7583 |
| res\_std | 446 | 0.0215 | 0.0190 | 0.0143 |  0.0245\*\*\* |  0.0210\*\*\* | 0.0136 |

|  |  |
| --- | --- |
|  **Post-merger** |  |
|  | **Non-segment** | **Segment** |
|  |  **N** | **Mean** | **Median** | **StdDev** | **Mean** | **Median** | **StdDev** |
| Size | 777 | 5.2926 | 5.0091 | 2.1958 | 5.3507 |  5.3063\* | 1.5431 |
| NI\_Assets | 777 | 0.0237 | 0.0348 | 0.0963 | 0.0269 | 0.0399 | 0.0984 |
| Sales Growth | 777 | 0.1903 | 0.1659 | 0.3551 | 0.2003 | 0.1731 | 0.3428 |
| Leverage | 777 | 0.5998 | 0.6110 | 0.1994 | 0.5966 | 0.6133 | 0.1805 |
| Turn | 777 | 1.1841 | 1.1025 | 0.6337 | 1.2133 | 1.1184 | 0.6392 |
| Auditor | 777 | 0.5740 | 1.0000 | 0.4948 | 0.5714 | 1.0000 | 0.4952 |
| IFRS\_USGAAP | 777 | 0.4994 | 0.0000 | 0.5003 | 0.5006 | 1.0000 | 0.5003 |
| USCROSSLISTED | 777 | 0.0026 | 0.0000 | 0.0507 | 0.0077 | 0.0000 | 0.0876 |
| # FExchanges | 777 | 0.1429 | 0.0000 | 0.4963 | 0.1828 | 0.0000 | 0.6639 |
| res\_std | 777 | 0.0205 | 0.0173 | 0.0127 | 0.0211 |  0.0180\*\* | 0.0106 |

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 **Table 9 Panel B (continued)**

The panel provides descriptive statistics for the variables included in the analysis. It shows the values for the mean, median, and standard deviation for a number of characteristics of the firm-years included in our propensity-score matched sample, split by segment and calculated separately for the pre- and post-merger period. The table also shows a comparison between the means and medians of the firm characteristics based on a t-test and a Wilcoxon rank-sum test, respectively. \*\*\* indicates statistical significance at the 0.01 level, \*\* indicates statistical significance at the 0.05 level, and \* indicates statistical significance at the 0.10 level. All variables are as defined on Table 2 of the paper.

**Panel C: PSM liquidity regression results**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) |
|  | perc\_zeroret | perc\_zeroret | log\_mn\_bidask | log\_mn\_bidask |
| Post-Merger | -0.086\* | -0.020 |  0.532\*\*\* |  0.342\*\*\* |
|  | (1.77) | (0.44) | (3.38) | (2.71) |
|  |  |  |  |  |
| Segment |  -0.131\*\*\* |  -0.118\*\*\* | -0.134 |  -0.151\*\*\* |
|  | (5.00) | (7.19) | (1.49) | (2.61) |
|  |  |  |  |  |
| Post-Merger\*Segment | -0.042\* |  -0.045\*\* | -0.154\* | -0.112\* |
|  | (1.76) | (2.54) | (1.67) | (1.75) |
|  |  |  |  |  |
| Leverage |  | 0.017 |  | 0.081 |
|  |  | (0.47) |  | (0.75) |
|  |  |  |  |  |
| NI\_Assets |  | -0.047 |  |  0.438\*\* |
|  |  | (0.79) |  | (2.31) |
|  |  |  |  |  |
| #FExchanges |  | 0.012 |  | -0.016 |
|  |  | (1.47) |  | (0.67) |
|  |  |  |  |  |
| Sales Growth |  | 0.007 |  | 0.046 |
|  |  | (0.57) |  | (0.81) |
|  |  |  |  |  |
| Size |  |  -0.088\*\*\* |  |  -0.442\*\*\* |
|  |  | (24.49) |  | (36.44) |
|  |  |  |  |  |
| Auditor |  | -0.013 |  | -0.043 |
|  |  | (0.84) |  | (0.93) |
|  |  |  |  |  |
| IFRS\_USGAAP |  | -0.014 |  | 0.011 |
|  |  | (0.62) |  | (0.12) |
|  |  |  |  |  |
| USCROSSLISTED |  |  0.081\*\* |  | -0.061 |
|  |  | (2.07) |  | (0.23) |
|  |  |  |  |  |
| ret\_std |  |  -7.970\*\*\* |  | 2.382 |
|  |  | (10.36) |  | (1.28) |
|  |  |  |  |  |
| Constant |  0.289\*\*\* |  0.954\*\*\* |  -4.278\*\*\* |  -1.562\*\*\* |
|  | (4.90) | (16.79) | (24.08) | (12.06) |
|  |  |  |  |  |
| Observations | 2,446 | 2,446 | 2,446 | 2,446 |
| Adjusted R-squared | 0.18 | 0.59 | 0.14 | 0.71 |

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**Table 9 Panel C (continued)**

The panel includes a comparison of liquidity for segment vs. non-segment firms from the pre- to the post-merger period for our propensity-score matched sample. It shows the results from OLS regressions:

perc\_zeroret (mn\_bidask) = β0 +β1\*Segment+ β2\*Post-Merger + β3\*Post-Merger\*Segment (for models 1 and 3 in the panel);

 perc\_zeroret (mn\_bidask) = β0 +β1\*Segment + β2\*Post-Merger + β3\*Post-Merger\*Segment+ Σβi\*Control Variables (for models 2 and 4).

All variables are as defined in table 2 of the paper. \*\*\* indicates statistical significance at the 0.01 level, \*\* indicates statistical significance at the 0.05 level, and \* indicates statistical significance at the 0.10 level (two-tailed test).

1. Nielsson (2009) discusses the demutualization and merger of cross-border stock exchanges, and the limited interdependence that resulted. Euronext is the only integrated trading platform accompanying a cross-border stock exchange merger to date. [↑](#footnote-ref-1)
2. See The Economist (2006). [↑](#footnote-ref-2)
3. Federal Reserve Bank of New York (2002) discusses the goals of the European stock exchange consolidation and the potential benefits, especially liquidity and lessened fragmentation. [↑](#footnote-ref-3)
4. Throughout this paper, we refer to NextEconomy and NextPrime collectively as "the named segments". We include the two segments in one category in our primary analyses, but also describe results supporting the same inferences separately for each segment as diagnostics. [↑](#footnote-ref-4)
5. See Karolyi (2012) for a review and discussion of the bonding literature. [↑](#footnote-ref-5)
6. See Vagias and van Dijk (2012). [↑](#footnote-ref-6)
7. It is plausible that finding increases in liquidity for segment firms in the post-merger period is mechanical. Our cross-sectional tests using differences in firms' compliance with the Commitment Agreements address this concern. See section 4.2.3. [↑](#footnote-ref-7)
8. Note that auditors and other certification agents are also able to certify compliance with higher standards of accounting quality. However, these agents cannot *impose* a set of enhanced uniform rules for financial reporting and disclosure. Therefore, the segmentation mechanism has a unique role in this regard. [↑](#footnote-ref-8)
9. Given that we focus on equity markets, we do not examine firms listed on the Exchange in the United Kingdom because only derivative securities are traded on the LIFFE (London International Financial Futures Exchange). In 2010, NYSE Euronext launched a new market in London for international issuers, but with a separate trading platform. [↑](#footnote-ref-9)
10. Much of the descriptive material in Sections 2.1 and 2.2 is gathered from the Euronext NV Annual Reports of 2001 through 2008. For additional description of the Euronext segments, see Euronext Product Information on the NYSE Euronext website at http://www.euronext.com/editorial/wide/editorial-2667-EN.html?selectedMep=2&idInstrument=15427 &isin Code=NL0000251304. [↑](#footnote-ref-10)
11. See archived weekly notices of removals and additions on the NYSE Euronext website. [↑](#footnote-ref-11)
12. See “Suppression des segments Nextprime et Nexteconomy" published by NYSE Euronext on 10/23/2007. [↑](#footnote-ref-12)
13. See Christensen, Hail, and Leuz (2011) for a description of the implementation and enforcement of the EU Market Abuse and Transparency Directives and their effects on market liquidity and cost of capital. We did not expect the disbanding of the two named segments following the Transparency Directive to change the compliance choices of our segment firms, given that disclosure and reporting policies are sticky, and we present results consistent with that expectation. We expected the disclosure and reporting of the non-segment firms to improve. If present, such improvement would increase the similarity between segment and non-segment firms. [↑](#footnote-ref-13)
14. Note that the segment listing requirements also require that firms describe corporate governance policy in the annual reports. We have chosen to focus on the financial reporting provisions of the listing agreements because we think the requirement itself is not a very meaningful measure. Although the investigation of the role of corporate governance requirements would be an interesting inquiry, it is beyond the scope of our current paper. [↑](#footnote-ref-14)
15. Although the sample period we use in the main analysis ends in 2007, table 1 includes data for the years 2008 and 2009 as well. We present these data to address two possible concerns: (1) the segment firms might have backed away from enhanced disclosure and reporting quality when they were no longer trying to distinguish themselves from the non-segment firms; and/or (2) the difference between the two groups might have disappeared when all firms faced the same requirements after the dissolution of the NextPrime and NextEconomy segments. The data for 2008 and 2009 indicate that the segment firms did not renege on their commitment for improved reporting and that the difference between them and non-segment firms persisted. Financial reporting and transparency improved for non-segment firms in both years but never reached the segment firms' levels. [↑](#footnote-ref-15)
16. The percentage of segment and non-segment firms with global auditors reported in table 1 is greater than the one included as part of the descriptive statistics in panel C of table 3. We attribute the difference to three possible reasons: (1) mistakes in the WorldScope database (Daske et al. 2013); (2) the lack of time-specific data on auditors in WorldScope, in which auditor data are provided for the last reporting period only; and (3) while this section tabulates data on the NextPrime and NextEconomy populations, we remove some firms in the main analysis due to data availability and outlier concerns. [↑](#footnote-ref-16)
17. This is not entirely surprising, because firms from some EU countries use IFRS for consolidated statements but domestic GAAP for single entity financial statements, and firms from some other EU countries were permitted rather than required to use IFRS from 2005. Some EU countries granted two-year extensions to at least some firms to comply with the IFRS mandate. See Pownall and Wieczynska (2013) for data on compliance with the EU IFRS mandate, and also "Implementation of the IAS Regulation (1606/2002) in the EU and EEA" available from the European Commission at http://ec.europa.eu/internal\_market/accounting/docs/ias/ias-use-of-options\_en.pdf. [↑](#footnote-ref-17)
18. The European Commission proposed in late 2011 that quarterly reporting ceased to be required for EU firms, in favor of a centralized data repository and enhanced relevance to investors. See European Commission (2011). [↑](#footnote-ref-18)
19. The statistics on table 1 should be interpreted as lower bounds on the true underlying distributions of characteristics of segment and non-segment firms for several reasons. First, we may not have captured all available data from financial reports, because Euronext has no central repository for financial reports such as the Edgar database for SEC filings by publicly-traded firms in the U.S. To the extent that ThomsonOne is selective in the filings it archives we may have missed primary or secondary reports exhibiting the characteristics for which we were searching. We know that ThomsonOne is not an exhaustive enumeration of sample firms' financial reports, because we were able to locate financial reports on firms' websites that were not included in ThomsonOne. Second, our search of companies' websites was comprehensive but there can be no guarantee that we discovered financial reports when they were included on the website because of differences in the formats and structure of the individual websites. Finally, because the implementation of the switch to IFRS was non-routine, we may have missed primary or secondary statements that exhibited the characteristics for which we searched. [↑](#footnote-ref-19)
20. See Pownall, Vulcheva, and Wang (2013) for an analysis of changes in Home Bias among EU firms following the establishment of Euronext with its integrated trading platform and named segments. [↑](#footnote-ref-20)
21. See also Christensen, Hail, and Leuz (2011) for analysis of cross-country variation in implementation and enforcement for the outcomes of securities regulation in the European Union. [↑](#footnote-ref-21)
22. We are unable to construct a complete time series of enforcement proxies. However, using number of employees involved in enforcement (one of Jackson and Roe's 2009 alternate proxies), we find that enforcement has increased materially in Brussels (from 259 in 2001 to 408 in 2004, the last year for which data are available) and Amsterdam (from 139 in 2000 to 446 in 2007), but has remained fairly constant in Paris (595-600) and Lisbon (170-172). See Central Banking Publications Ltd. (2008) for more details. [↑](#footnote-ref-22)
23. It would be interesting to conduct a cross-sectional test based on the dimension of jurisdiction quality. However, the existing enforcement measures and classifications suggest that differences in enforcement do exist, but there is not a consensus on the relative levels of jurisdiction quality in the four Euronext countries. It is beyond the scope of the current paper to establish how different enforcement was at the time of the Euronext integration or how the four countries ranked based on their enforcement levels. [↑](#footnote-ref-23)
24. Throughout the paper, we refer to “pre-merger/post-merger period” or “before/after the merger” as the period prior to/after the formation of Euronext, partitioned by the event of achieving a single cash trading platform: while the three exchanges of Amsterdam, Brussels, and Paris began using single cash trading platforms in 2001, the Lisbon exchange joined only in November 2003. Therefore, “pre-merger periods” are between 1993 and 2001 for firms listed on the Amsterdam, Brussels, and Paris Exchanges and between 1993 and 2003 for firms listed on the Lisbon Exchange, and “post-merger periods” are between 2002 and 2007 for firms listed on the Amsterdam, Brussels, and Paris Exchanges and between 2004 and 2007 for firms listed on the Lisbon Exchange. [↑](#footnote-ref-24)
25. We limit our analysis to domestic firms because we believe that their incentives might differ from those of cross-listed foreign firms. See table 2 for variable definitions and data sources for all analyses. [↑](#footnote-ref-25)
26. A database on the listing and delisting dates for the companies from the four exchanges provided by ThomsonOne Banker indicates that the majority of firms without post-merger data delisted during the period prior to the Euronext merger or within a couple of years following the merger. Likewise, most firms that lack pre-merger data were newly listed in the period 2002–2007. Thus, excluding these firms accounts for a change in the exchange population rather than for missing data in Worldscope and/or Datastream. [↑](#footnote-ref-26)
27. In the process of integrating the four stock exchanges, decimalization or reduction of tick sizes might also result in increased liquidity (i.e. lower bid-ask spreads). However, we believe that decimalization is not an alternative explanation for our findings because: (1) the earliest decimalization we found was conducted by NYSE Euronext in 2008 and therefore outside of our sample period 1993–2007 (Euronext Cash Market Info-flash**,** <http://www.euronext.com/>**fic/000/036/646/ 366467.pdf); and (2) even if we are unaware of an earlier wave of decimalization that took place during our sample period, we would expect such wave to affect all securities on Euronext to a similar extent. In contrast, our results indicate that liquidity improved only for segment firms after the merger, but not for non-segment firms.**  [↑](#footnote-ref-27)
28. See Vagias and van Dijk (2012) for further evidence and discussion of the decreased liquidity for European firms during this time period. [↑](#footnote-ref-28)
29. Roberts and Whited (2012) suggest that difference-in-differences estimators are one effective approach to recover the treatment effects arising from sharp changes in the economic and institutional environment. We think that the exogenous variation created by a quasi-experiment such as Euronext merger offers a practical solution to the endogeneity problem we face (i.e., correlated omitted variables). While one standard solution to endogeneity is to have an instrument for the “Segment” indicator, it is difficult to implement in our empirical analyses because we do not feel confident to identify a valid instrument out of our available data (see also Roberts and Whited 2012). [↑](#footnote-ref-29)
30. We did not include analyst following in the primary regression model due to the significant loss of data resulting from merging our financial reporting and market data with the IBES database. We conducted a sensitivity analysis to include analyst following as an additional control but on a reduced sample (untabulated). The results support the same inferences as those presented in the paper for the percentage of days with zero returns, but the results for the log of mean bid-ask spread are not significant, probably due to the reduced sample size. [↑](#footnote-ref-30)
31. See Leuz and Verrecchia (2000) and Christensen et al. (2011) for the use of the logarithm of average bid-ask spread as a liquidity measure. [↑](#footnote-ref-31)
32. As discussed in section 2, 39 of our sample firms were dropped from the segments during the post-merger period, and 19 firms who were listed on Euronext during the post-merger period subsequently joined one of the segments. The firms that were dropped from the segments continued to be traded on Euronext, and were not lost to mergers and acquisitions, bankruptcy, or other voluntary or involuntary delistings from the exchange. For example, the French producer of steel tubes and tube products Vallourec was removed from the NextPrime segment and index in 2003 in accordance with Article 11.3 of the Inclusion Agreement (LISTING DEPARTMENT AVIS N° 459 - BERICHT NR 459 - NOTICE NR 459 - 17-12-2003, http://www.euronext.com/fic/000/010/233/102339.pdf) but to this day remains traded on Euronext Paris. [↑](#footnote-ref-32)
33. Given that we do not have complete time series of the other three dimensions of the compliance measure, the results documented in this table should be interpreted as suggestive. [↑](#footnote-ref-33)
34. Statistical tests on the differences in the coefficients on the triple interaction term are t-tests computed by running stacked regressions in which the first of each pair of models is run after adding an interaction between each term in the model and Segment (column 2), Low-Compliance Segment (column 5), or High-Compliance Segment (column 8) designations. [↑](#footnote-ref-34)
35. This equation is similar to Eq. (1) from Barth et al. (2007), but our dependent variable is net income, so the residuals can be interpreted as the variability of net income rather than the variability of the change in net income. We do not difference net income to avoid the substantial additional loss of data. In addition, because the variables of debt and equity issuance (Worldscope) are missing for the majority of our sample firms and we have included variables that we posit are related to the choice to become listed on the named segments, we do not include the debt and equity issuance variables from Barth et al.’s (2007) Eq. (1). [↑](#footnote-ref-35)
36. Note our measure is based on variability of earnings level relative to variability of OCF level, which is different from the measure in Barth et al. (2007) that compares variability of earnings changes to variability of OCF changes. We think that this measure can achieve the same goal of measuring earnings variability for the following two reasons: first, this approach is similar in spirit to the analysis of net income relative to OCF in Leuz et al (2003). To the extent that the estimation of variability of both net income and OCF is at their levels, our measure should provide a proxy for the variability of earnings after controlling for the underlying operating environment. Second, we have also examined other accounting quality measures. To the extent that the results from various analyses are consistent, the validity of the results are enhanced. [↑](#footnote-ref-36)
37. We conjecture that the largest firms’ not joining the named segments is attributable not only to the focus of the named segments on small and mid-cap firms, but also on the fact that for the largest Euronext-listed firms, being larger, more internationally visible, and more likely to be listed on US exchanges already conferred credibility. [↑](#footnote-ref-37)