

DOCUMENTATIEBLAD

**CONSOLIDATING STOCK EXCHANGES:  
IS ACCESS TO A LOCAL STOCK MARKET STILL NEEDED?**

**Nancy Huyghebaert**

Associate Professor of Finance

K.U.Leuven

Faculty of Economics and Applied Economics

Department of Accountancy, Finance and Insurance

Naamsestraat 69

3000 Leuven

nancy.huyghebaert@econ.kuleuven.be\*

***Abstract***

*This paper discusses the importance of local stock market development for a country's long-run economic growth. At the firm level, it argues that companies wishing to raise external equity structure their IPO and choose a listing venue so that a liquid market in their shares can arise. Recent trends in the stock exchange industry provide a rationale for cross-border stock market mergers, however. This paper reviews the literature on stock market competition, specialization, internationalization and cross-listings to derive the conditions that stock market mergers should satisfy in order to contribute to local stock market development, given its micro- and macro-economic importance.*

**JEL CLASSIFICATION:** E44, G14, G15, N20

\* The author thanks Frank Lierman, Mathieu Luypaert, Piet Sercu and Gunther Wuyts for comments on an earlier draft of this paper.

## 1. INTRODUCTION

Stock market development is a research topic with wide-ranging implications for firms and economies. Michelacci and Suarez (2004), for example, point out that an active stock market encourages business creation, innovation, and growth by allowing young companies to go public at an earlier stage, which redirects informed capital from banks and venture capitalists towards new start-ups (see also Black and Gilson, 1998). Likewise, Levine (1991) develops a model where more liquid stock markets, i.e. markets where it is less expensive to trade securities, reduce the disincentives to invest in long-duration projects because investors can easily sell their stake in such projects if they need their savings before project maturity. Devereux and Smith (1994) and Obstfeld (1994), however, stress the role of international stock market integration: international risk sharing induces investors to shift their portfolios from safe, low-return projects to riskier high-return investments, thereby accelerating long-run economic growth. Using data from 47 countries during the period 1976–1993, Levine and Zervos (1998) show that at the aggregate (country) level, a better developed, i.e. more liquid, stock market contributes to long-term growth. From reviewing the literature, Levine (1997) and Levine (2005) conclude that financial markets tend to develop as income per capita grows, the institutional environment improves, and financial reform progresses.

More recently, Claessens *et al.* (2006) show that local stock market development and internationalization of stock exchange activities (listing, capital raising, and trading abroad) are influenced by the *same* economic fundamentals. More specifically, they find that higher-income economies with sounder macro-economic policies, higher growth opportunities, more efficient legal systems, and greater openness have more developed local securities markets. Importantly, these fundamentals also relate to internationalization, and actually *more so*, since the better the fundamentals, the higher the ratio of internationalization to local stock market activity. Furthermore, they find that larger domestic stock market development is associated with subsequent higher internationalization, suggesting that better country fundamentals *allow* firms to tap international securities markets and that especially firms in countries with more developed stock markets exhibit such internationalization. Yet, Claessens *et al.* (2006) also recognize that an accelerated internationalization of stock market activities could negatively impact the development of domestic stock markets. Given the ongoing consolidation of stock exchanges, which is becoming increasingly cross-border in nature and targeting especially European securities markets, this paper therefore analyzes whether and how (international) stock market mergers may influence the development of local stock markets and, hence, local firms and investors.

For this purpose, we start by examining the literature on why (European) companies go public. In Section 3, we argue that IPO firms actually structure their IPO deal and choose a listing venue in order to establish a liquid market in their shares. The trend towards liquidity agglomeration is documented in Section 3 as well. In the fourth section, we present some recent trends in the stock exchange industry and discuss how stock exchanges are dealing with increased internal and external competition. From surveying the literature on stock market competition, specialization,

internationalization and cross-listings, we derive the conditions that stock market mergers should satisfy in order to contribute to local stock market development, given its micro- and macro-economic importance. The final section concludes this paper.

## 2. WHY DO COMPANIES GO PUBLIC ?

In this section, we discuss why companies go public. Early research on the listing decisions of European firms has offered a rather pessimistic view on the role played by European stock exchanges, as it suggests that stock markets are not used as a mechanism to finance growth, but rather as a way for corporate owners to reduce their firm's financial risk – primarily through a rebalancing of capital structure – and to cut back on their involvement in the company. Pagano *et al.* (1998), for example, use Italian data to study the question why companies go public. From comparing privately held and publicly listed firms during 1982–1992, they conclude that the likelihood of an IPO is positively related to the firm's size and the industry market-to-book ratio. Also, they find that the limited amount of new equity raised upon listing is used to reduce leverage rather than to finance firm growth. Furthermore, once introduced on the exchange, IPO firms show an abnormal reduction in profitability and a high turnover of control. Similar results have been obtained by Högholm and Rydqvist (1995) for Sweden during 1970–1991, and by Goergen (1998) for German and UK IPOs during 1970–1988.

However, several changes have taken place in Continental Europe since the sample period(s) covered by these earlier studies. Cornelli and Goldreich (2001) and Sherman (2000), for example, have documented the global trend towards using the bookbuilding method for selling IPO shares, which assigns a large role to professional investors in setting the offering price. Also, in the second half of the nineties, new markets, such as EASDAQ and the alliance of European growth markets Euro.NM, were set up to meet the needs of an increasing number of young and high-growth companies. Belgium has participated in this Euro.NM project, in order to stimulate the listing of young high-growth companies<sup>1</sup>. Not surprisingly, Huyghebaert and Van Hulle (2006), who study the determinants of the portions of primary (i.e. newly issued) and secondary (i.e. existing) shares in a sample of 95 Belgian IPOs during 1984–2000, document that Belgium has witnessed an increase in the number of young growth firms going public during the second half of the nineties, after a period with low IPO activity where mainly older firms became listed.

---

1 After their collapse, Belgium has taken new initiatives targeting small and innovative growth companies without too much of a track record, such as the Vrije Markt and Alternext.

Their results further show that younger and smaller firms with a higher market-to-book ratio and limited internal cash generation issue a larger fraction of primary shares at IPO-time. The size of the primary portion is also positively influenced by the fraction of bank debt whereas stock market conditions, as measured by stock market returns and issue activity in the year preceding the IPO, have no demonstrable impact. Overall, these findings indicate that the wish to raise additional financing is a major motive in the decision to go public, and that it drives the size of the primary portion. Conversely, mature firms with high internal cash generation tend to offer only secondary shares. For these established companies, windows of opportunity do seem to influence the size of the secondary portion to some extent. Overall, the diversification motive does not drive the size of the secondary portion, but adverse selection costs have an impact. This finding is consistent with the work of Gomes (2000) and Habib and Ljungqvist (2001), among others, who argue that when underpricing imposes large costs, owners with a substantial stake in the IPO firm may try to maximize their overall proceeds from divesting by limiting the secondary portion and selling shares gradually afterwards. Particularly for the USA, the literature has found that investors in young growth firms (venture capitalists) use the stock market as an exit mechanism. Over time, this has become more important in Europe as well (e.g., Bertoni and Giudici, 2003). In fact, Black and Gilson (1998) even argue that an active stock market is needed to facilitate VC-backed IPO exits and hence necessary to promote the development of an active venture capital market. Consistent with these arguments, Jeng and Wells (2000) find that IPOs are the strongest driver of venture capital investments across countries although Cumming *et al.* (2006) recently point out the importance of the quality of a country's legal system rather than stock market size as instrumental to the mutual development of IPO markets and venture capital markets.

Finally, the evidence in Huyghebaert and Van Hulle (2006) suggests that the creation of a liquid market – which is an important concern for firms that plan to tap the stock market in the future – induces firms with growth opportunities and considerable internal cash generation to add secondary shares to a relatively small primary portion to achieve a sufficiently large free float. So, if financing needs warrant a relatively small primary portion, companies add secondary shares to increase the offering size, which allows attracting more institutional investor interest for their firm and increases the firm's visibility, thereby enlarging post-IPO stock liquidity. There is a rationale to this as investor recognition and stock liquidity reduce a firm's cost of capital (e.g., Amihud and Mendelson, 1986; Merton, 1987). Likewise, Butler *et al.* (2005) empirically find that the fees charged by investment bankers in seasoned equity offerings are significantly lower for firms with more liquid stock. Consistent with this story, Huyghebaert and Van Hulle (2006) find that firms selling primary shares – possibly next to also a secondary portion – achieve higher stock liquidity and tend to raise additional equity post-IPO. In contrast, well-established firms selling only secondary shares at IPO-time do not actively structure their IPO to enhance stock liquidity, but are more likely to be taken over following their IPO.

To summarize, stock markets are an important source of financing for companies that go public, and especially so for the young high-growth firms in an economy. For the latter firms, the stock market is also frequently used as an exit mechanism for venture capitalists. Firms structure their IPO such that a liquid market in their shares can arise. In the next section, we wish to determine whether these concerns also affect their choice of listing venue.

### 3. THE CHOICE OF STOCK EXCHANGE

The two most important functions of stock exchanges are:

- 1) providing listing services to firms and
- 2) offering trading services to investors.<sup>2</sup>

Hence, stock markets have two main customer types: firms that want to be listed and financial intermediaries that want to trade, for their own account or for the account of institutional and retail investors. As a result, exchanges can be considered as networks, in which the greater the number of participants, the higher the utility for everyone (e.g., Economides and Schwartz, 1995; Economides, 1996). Listed companies expect stock exchanges to create the greatest possible liquidity in their shares, in a transparent and fair price-formation process. According to Di Noia (2001), firms prefer to list where other companies are listed (the *direct-network effect*) and especially where many intermediaries – each of them having access to an own investor base – trade (the *cross-network effect*). When applied to the listing venue choice, the model suggests that firms should choose to list on the exchange that provides them with the greatest visibility and largest investor base, *ceteris paribus*. Nor surprisingly, visibility and improved access to investors are cited among the most important factors in a firm's listing decision (e.g., Baker and Johnson, 1990).

---

2 Some exchanges also provide clearing and settlement services (e.g., Deutsche Börse, via its subsidiary Clearstream).

Foucault and Parlour (2004) develop a model in which two profit-maximizing exchanges compete for IPO listings on the basis of listing fees paid by firms wishing to go public and trading costs incurred by investors. While all firms prefer lower costs, companies differ in how they value a decrease in trading costs. In equilibrium, competing exchanges obtain positive expected profits by differentiating their listing fees and trading costs. As a result, firms that list on different exchanges have distinct characteristics. In particular, the model predicts that large IPOs will list on the exchange with higher listing fees, but lower trading costs. Likewise, Aggarwal and Angel (1999) model the trade-off between high-trading-cost, high-service markets and low-trading-cost, low-service markets and derive that small, relatively unknown firms will list on a higher-cost dealer market that offers sponsorship<sup>3</sup>. The Nasdaq market, for example, offers sponsorship under which Nasdaq market makers promote the securities they trade to investors. In particular, market makers on Nasdaq commit themselves to take sizeable positions in a company's stock, trade via their institutional contacts and their own or affiliated retail networks, and maintain continuous research coverage. Hence, sponsorship may affect the investor base and should be most valuable for firms that are relatively unknown among investors.

Corwin and Harris (2001) empirically analyze the choice of listing venue by IPO firms that qualify for listing on the New York Stock Exchange (NYSE) during the period 1991–1996; in other words, all firms in their sample meet the more restrictive listing requirements on NYSE (in terms of number of publicly held shares, issue proceeds, total assets and pre-tax accounting income), but only 76.9% of the companies actually choose to list on that stock market. The other 23.1% prefers to list on Nasdaq. Corwin and Harris empirically document the forces that influence a firm's listing choice.

First, they point out the role of listing costs. On the one hand, firms have to pay some fees upon initial listing, including underwriting, legal and accounting fees; these costs are sunk for companies that may have to delist again in the future. On the other hand, publicly quoted firms face annual listing costs. Both types of costs generally increase with the number of listed shares, although in a non-linear way. Corwin and Harris (2001) show that the direct issue costs are substantially higher on the NYSE than on Nasdaq, but after taking into account indirect listing costs (underpricing), they find that total issue costs do not differ significantly across these two exchanges. Yet, they do find that smaller, riskier firms tend to list on Nasdaq, which suggests that firms avoid listing on NYSE when they may have to delist again in the future as a result of dropping below the NYSE listing requirements. Hence, firms may delay listing on NYSE, especially when they are small and risky, until they are confident that they can maintain listing eligibility. The fact that small firms tend to list on Nasdaq may also suggest that sponsorship is an important factor in the listing decision. However, Corwin and Harris find no evidence that younger firms, which would also benefit from sponsorship, are more likely to list on Nasdaq than on the NYSE.

---

3 Aggarwal and Angel suggest that the incentives to engage in sponsorship result from wider bid-ask spreads and the market maker's ability to internalize order flows. Yet, Van Ness *et al.* (2005) find that more market makers promoting the stock of a particular company reduces the spread because of increased market-maker competition. Furthermore, order flow internalization is increasing in the number of market makers and allows for greater information production.

Second, Corwin and Harris (2001) find that IPO candidates are more likely to list on the exchange where other firms in their industry (industry peers) are currently listed. Furthermore, reverse LBOs and carveouts are more likely to choose the NYSE if their firm or their parent was previously NYSE-listed. These results suggest that exchange expertise in trading similar securities and prior exchange relationships are important considerations in the choice of listing venue. Hence, despite the NYSE's increased efforts to attract the largest technology companies, Nasdaq continues to be considered as the primary listing venue for these firms. This may reflect a perception by listing firms that market makers have valuable knowledge about a particular firm or industry.

Finally, Corwin and Harris (2001) do not find that firms initiating a lot of seasoned equity offerings choose to list on NYSE. For many firms, the IPO is the first in a series of public offerings and for these firms, liquidity could be an important consideration in the listing venue decision. Several studies provide empirical evidence of differences in liquidity across securities markets. Although they do not completely agree, these studies generally report higher levels of liquidity on the NYSE than on Nasdaq (e.g., Kadlec and McConnell, 1994; Huang and Stoll, 1996) and an increase in liquidity when firms move from Nasdaq to the NYSE (e.g., Cowan *et al.*, 1992; Christie and Huang, 1994; Barclay, 1997)<sup>4</sup>. Likewise, Cowan *et al.* (1992) compare the characteristics of firms that move from Nasdaq to NYSE with those that are NYSE-eligible, but choose to stay on Nasdaq and find that firms leave for NYSE to obtain a more liquid market for their shares. Although these results suggest that most firms could improve their liquidity by listing initially on the NYSE, this benefit is likely to be most important for firms that plan to return to the capital market to raise new equity. Nevertheless, Corwin and Harris do not find that firms that are following a seasoning strategy are more likely to list on the NYSE, after taking into account the role of listing costs and the clustering of industry peers.

---

4 In contrast, Baker *et al.* (1999) find that the increase in analyst coverage and institutional shareholdings commonly attributed to listing on the NYSE are explained primarily by growth in market capitalization rather than by the listing itself.

Several companies list their shares not only on one (mostly domestic) market, but also on one or more foreign stock exchange(s). A listing abroad generally facilitates trading by foreign investors and therefore tends to attract these into the ranks of a firm's shareholders. Conclusions similar to those above have resulted from the literature on cross-listing rationales. Pagano *et al.* (2001), for example, examine the cross-listing decisions of European quoted firms during 1986–1997 and find that companies are more likely to cross-list in larger and more liquid stock markets, and in markets where several companies from their own industry are already cross-listed. Firms are also more likely to cross-list in countries with better investor protection, and more efficient courts and bureaucracy, but not with more stringent accounting standards. Some of these findings are also obtained by Sarkissian and Schill (2004), who study the population of overseas listings across world markets; they conclude that geographical, economic, cultural, and industrial proximity play a dominant role in the choice of overseas listing venue. International portfolio diversification gains in listing abroad seem not very important. Finally, studies on the cross-listing decisions of emerging-market companies especially stress the role of disclosure and regulatory standards, which allow firms from countries with weak institutional environments to commit to a relatively low level of private benefits of control in the future. This bonding view of cross-listings provides a compelling case that the desire to protect minority shareholders' rights is an important reason why emerging-market firms choose to cross-list their shares in the USA, which facilitates subsequent access to equity markets (e.g., Benos and Weisbach, 2004; Doidge *et al.*, 2004; Karolyi, 2006).

The above *familiarity bias* in the listing choice of IPO firms is also well-known in the portfolio decisions of individual and professional investors, as witnessed by the important role that geographical distance plays in their investment choices. So, while firms may choose to list abroad to achieve higher market liquidity and a better price for their stock, the literature has documented that investors, even professionals, are rather conservative and have a bias towards investing in firms from their home country. This phenomenon has been called the *home equity bias*. Grinblatt and Keloharju (2000), for example, show that Finnish investors' portfolios overweigh the stocks of geographically close companies. Coval and Moskowitz (1999) identify a similar bias in the portfolio choices of US domestic portfolio funds. Ivkovic and Weisbenner (2005) document that individual investors' preferences for local stocks come from an information advantage rather than a behavioral bias, pointing out that the local component of investors' portfolios systematically outperforms the rest of their portfolios. Proximity confers an informational advantage also to institutional investors and analysts, as shown by Malloy (2005) and Brennan *et al.* (2005). Finally, Eun and Sabherwal (2003) document for Canadian stocks cross-listed on the Toronto Stock Exchange (TSE) and an US exchange that price discovery is affected by the location of trade. They find that the home market generally dominates price discovery. Halling *et al.* (2006) conclude that also for European cross-listed firms, the relevant market is within their home country.

Like listing candidates, also intermediaries want to be active on exchanges where more firms and other traders are present, to increase their own attractiveness to their customers (investors) and for themselves (w.r.t. their own portfolios and risk-management services). Several explanations have been offered. For instance, as the costs of running an exchange are fixed to a large extent, the transaction costs of trading should be lower in a more liquid stock market. Also, a more liquid securities market reduces the price impact of block trades. Not surprisingly, the literature has documented a tendency towards *liquidity agglomeration*, owing to the positive externalities present in the trading process (e.g., Pagano, 1989; Admati and Pfleiderer, 1988; Chowdhry and Nanda, 1991). In other words, when a security is traded simultaneously on two or more exchanges, trading externalities favor the concentration of trading on a single market, unless some friction prevents this outcome. Positive trading externalities arise from the fact that the participation by other traders in the market reduces the adverse price effect of one's own orders in models with imperfectly competitive, risk-averse traders as well as in models with asymmetric information.

Pagano (1989) illustrates this point in a model where risk-averse traders perceive their demand for a stock as adversely affecting its market price. A higher number of market participants implies a lower price sensitivity to a trader's net demand and thus a greater market liquidity. If a stock can be traded in two distinct markets with identical transaction costs, only two types of equilibria are possible: either all traders concentrate in the same market, or a knife-edge equilibrium occurs where traders separate between the two markets and are indifferent between these. With differential trading costs, a two-market equilibrium is possible where one market is characterized by a higher number of traders (and thus a lower price sensitivity to the order flow), greater cross-sectional diversity in the traders' information endowments, but higher transaction costs.

The tendency towards liquidity agglomeration also emerges in models with asymmetric information, as shown by Chowdhry and Nanda (1991) in a setting similar to that developed by Admati and Pfleiderer (1988). In their model, privately informed traders as well as discretionary and non-discretionary liquidity traders can place orders with risk-neutral market makers. In equilibrium, all informed traders with discretion over the location of their trades will place their orders in the market with the largest number of non-discretionary traders. The less liquid market remains operational only to the extent that some non-discretionary liquidity traders are trapped there. These traders' lack of discretion over their trading venue can be thought of as reflecting differences in trading costs. For instance, they may face prohibitively large trading costs abroad, but not at home. Therefore, also in this case, complete agglomeration of trades is blocked by differences in trading costs.

Overall, the above models suggest that when a company cross-lists its shares on another exchange, trade tends to concentrate on one of the two markets, unless this outcome is prevented by frictions, such as differential transaction costs or a time-zone difference that limits the overlap between trading hours. For foreign firms that cross-list

in the USA, Halling *et al.* (2006) find that the US market often attracts a significant fraction of total trading: for the median company, the US market typically features a trading volume of approximately 50% of the domestic counterpart immediately after the cross-listing, although this declines to  $\pm 25\%$  by year six, indicating that liquidity returns to the domestic market (a *flow-back effect*). Yet, this overall pattern masks considerable diversity across companies and countries. More specifically, the US market tends to be more active when the company is located in a country that is geographically close, has low financial development and relatively poor anti-insider trading protection. Geographical proximity may be capturing the familiarity of US investors with the company and its country's institutions, implying a lower informational disadvantage for US investors. Similarly, a low degree of domestic capital market development and investor protection may confer a comparative advantage to the US market in trading the foreign company's shares. Moreover, the relative size of the US market is larger if the company is small, volatile and high-tech. The latter contrasts with the notion that these foreign firms, typically being more sensitive to inside information, should be less appealing to US investors. Yet, according to Halling *et al.*, US investors may have developed a comparative advantage in evaluating small, highly volatile high-tech firms (see also the earlier documented specialization of the Nasdaq)<sup>5</sup>.

#### 4. RECENT TRENDS IN THE STOCK EXCHANGE INDUSTRY

Traditionally, exchanges were either public entities (like the Continental European stock exchanges) or formally private enterprises, regulated by public rules (the Anglo-Saxon exchanges). In the former case, financial intermediaries frequently were the owners of the stock exchange, which then was organized as a cooperative. In the various countries, stock exchanges were often natural (or even legal) monopolists, given the special nature of their activity, which very much resembled that of a public good. So, in each country, either only one stock exchange existed or only one was dominant and absorbed all small regional ones over time, as in Belgium, France, Italy, Spain, Germany and even the USA (e.g., Arnold *et al.*, 1999).

---

<sup>5</sup> Nevertheless, Bacidore and Sofianos (2002) find that non-US firms listed in the USA have wider spreads and less depth than US stocks.

Nevertheless, this simple structure of securities markets has changed dramatically all over the world during the last decades. The evolution and integration of financial markets in recent years have created increasing competition among stock exchanges, which nowadays are behaving more and more like standard industrial firms, having become publicly quoted by themselves. Not surprisingly, the competition among stock exchanges also became progressively more international over time. The 1986 Big-Bang deregulation in the UK, for example, allowed the London Stock Exchange (LSE) to attract, at least on a temporary basis, significant cross-border trading in big-cap equities on SEAQ International. This competitive threat from London resulted in major efforts to modernize Continental Europe's securities markets. Costs were cut, floors were closed, systems were repeatedly upgraded, etc. In the early 1990s, the NYSE also began to aggressively target IPO candidates for listing and increased its marketing efforts vis-à-vis IPOs. In 2001, the NYSE for the first time began trading the securities of a company that it does not list. Besides increased competition among stock exchanges, external competition from quasi-exchanges also emerged over time, although not always highly successful (e.g., *Tradepoint*, *Jiway*). Recently, seven large international investment banks have decided to launch a new trading platform for European stocks, *Turquoise*. From an economic point of view, such an alternative trading system (ATS) can be seen as a kind of exchange that specializes in producing trading services without producing listing services, given that it generally trades securities already listed on a regulated exchange. Degryse *et al.* (2007) provide an overview of the theoretical and empirical literature that analyses the success of alternative trading systems (in particular crossing networks) in competing with traditional exchanges.

Technological innovation has contributed a great deal to the above-discussed increase in competition. The location of stock-exchange computers has become irrelevant nowadays and market participants may now be anywhere; some roles of (former) participants have even been taken over by mathematical algorithms. In a few cases, these advances in technology have produced technological agreements among existing exchanges (e.g., common trading platforms, as in the case of Norex), but mostly they have resulted in new trading systems and exchanges, and price wars. In this way, competition among stock exchanges (Pagano and Steil, 1996) and among exchanges and alternative trading systems (Domowitz and Lee, 1996) has increased. Overall, the evolution of information and communication technology has made securities markets more integrated and more comparable.

Besides technological innovation, also financial globalization has advanced in the last two decades, with increased cross-border capital flows, a greater commercial presence of foreign financial firms in countries around the world, and tighter links among financial markets (e.g., Quan and Huyghebaert, 2007). Following the *Investment Service Directive* (ISD),<sup>6</sup> many exchanges have taken the opportunity to solicit remote members from other jurisdictions, allowing these intermediaries to far more efficiently serve their own domestic and international clients. Hence, the borders of the relevant market that ultimate investors face, are blurring (although, as argued in Section 3, a *home bias* remains in their investment decisions). The resulting increase in investor base has considerably enhanced the liquidity of most stock markets and has resulted in narrower spreads and a lower price impact of block transactions. Another important element in this financial globalization has been the increase in listing and capital raising abroad, most notably for emerging-market companies, but also for firms from developed countries. Many firms now *cross-list* on foreign exchanges and depositary receipts are a particularly popular instrument to access international financial markets.<sup>7</sup>

Looking forward, many expect this globalization trend to continue as technology further advances, access to information further improves and standards (concerning listing, corporate governance, accounting, and others) become more harmonized. To illustrate, an exchange with a price-driven trading system and one with an order-driven system may have found it difficult to merge in the past, but this feature has become less of an obstacle due to the large-scale introduction of hybrid trading platforms. Particularly for Europe, the enlargement of the monetary union and the implementation of the *Markets in Financial Instruments Directive* (MiFID) are assumed to further integrate securities markets. The European MiFID rule abolishes the monopoly position of classical stock exchanges as of November 2007. Also, banks will be allowed to handle orders internally (*in-house matching*) whereas traders will be obliged to determine the best price for their customers (the *best-execution principle*) and communicate transaction costs in a more transparent way. A major rationale behind MiFID (as for ISD) is to further reduce transaction costs, by making them more transparent, in order to increase market liquidity. In addition, the *best-execution principle* will stimulate an increase in competition, as it deals with the problem that liquidity tends to be sticky. Then, a new exchange or ATS may find it difficult to attract liquidity to its platform, even when its transaction costs are lower, as traders tend to stick on the incumbent market.

---

6 The *Investment Service Directive* (ISD) of 1996 introduced the mutual recognition and home-country control of all securities firms and banks performing investment services. Hence, the ISD allowed each recognized exchange to offer remote access to intermediaries in other countries. In addition, banks were allowed to trade directly on exchanges, without the need of subsidiaries that held a seat. The purpose of the reform was to successfully attract international liquidity to domestic securities markets.

7 There are different ways to list domestic stocks in international financial markets. A traditional way is to cross-list the shares in another exchange, which has been used frequently by European companies that cross-list in another (European) market. To get listed in the USA, European and especially emerging-market firms have issued depositary receipts, called *American Depositary Receipts* (ADRs) or *Global Depositary Receipts* (GDRs). These are instruments issued by international banks, representing a claim on the home securities held with a local custodian. DR programs grow or shrink depending on demand, since the issuance of DRs and the conversion back to the underlying shares only involve a small transaction cost.

As is common in other industries, deregulation, industry shocks and fierce competition affect M&A activity (e.g., Mitchell and Mulherin, 1996; Powell and Yawson, 2005; Luypaert and Huyghebaert, 2007). On the one hand, firms in mature or declining industries may want to shift their resources into growing industries by means of M&As, to guarantee their long-run survival. On the other hand, firms in low-growth industries may be obliged to consolidate in their own industries; this notion is commonly referred to as the *bankruptcy-avoidance hypothesis*. Besides, industry deregulation is also an important determinant of M&A activity across industries (e.g., Mitchell and Mulherin, 1996). Deregulation removes artificial constraints on the size of industry incumbents and induces market entry by new enterprises. In order to adapt to the changes engendered by deregulation, industries need to restructure and mergers and acquisitions can facilitate this process. Hence, stock market mergers are a natural and inevitable response to fierce internal and external competition, and may lead to some exchanges disappearing after M&As. As stock exchanges became listed themselves, the financing of M&As, through the exchange of shares in a stock swap, can be facilitated. In addition, exchanges are no longer being controlled by strategic investors that may block an M&A to preserve long-term interests. Although an M&A strategy may be optimal for the exchanges themselves and especially their shareholders<sup>8</sup>, the question arises whether such a solution is welfare-enhancing in general and benefits the listed firms, firms eligible for listing and investors. To answer this question, we examine the literature on stock market competition, internationalization and cross-listings in more detail in the next section.

## **5. THE PROCESS OF STOCK EXCHANGE CONSOLIDATION: WHAT CAN WE LEARN FROM THE LITERATURE?**

As argued in the previous section, the consolidation of regional stock exchanges in developed countries is almost finalized. Hence, the stock market mergers and acquisitions to come will be largely cross-border in nature. Thus far, this international consolidation seems to target mainly European stock exchanges. Yet, given the large number of Asian firms that are getting and will become listed in the future, it is clear that these emerging markets cannot be left aside in a further consolidation of the stock exchange industry, if any.

A first element one has to take into account in the discussion on consolidating stock exchanges is that by barring cross-border M&As, one will not be able to prevent the internationalization of stock exchange activities. As shown by Claessens *et al.* (2006), local stock market development and internationalization are natural processes that occur as countries grow and improve their institutions. Likewise, M&As are natural responses to deal with stiff competition.

---

8 Di Noia (2001) argues that an (implicit) merger among stock exchanges may be Pareto-optimal whereas competition may end up in inefficient equilibria. She further shows that in the end, exchanges may specialize in listing and trading services, or unilaterally start to trade stocks listed on other markets, as do many alternative trading systems in recent years.

Second, when stock exchanges consolidate in a globalizing world and start to compete on a world scale, they will be able to substantially reduce the costs of trading, as a large component of these transaction costs is fixed<sup>9</sup>. This is to the benefit of listed companies, intermediaries and investors, and should be welcomed. Furthermore, the tendency towards liquidity agglomeration, owing to the positive externalities present in the trading process and the existence of liquidity spillovers suggest that there is a powerful force for the consolidation of trading within a few markets. Yet, one has to take into account that differences in institutional and legal frameworks and the diversity of trading systems may still somewhat hinder the consolidation of stock exchanges, at least in the short run. Overall, there is a crucial role for market authorities in this consolidation process: they have to watch that the reduction in competition following stock market mergers does not result in an abuse of exchange market power and that not only exchange shareholders but also investors benefit from a reduction in transaction costs.

When thinking further about stock market mergers, different consolidation models seem possible, however. On the one hand, stock exchanges could become fully integrated, with one price board. This model has been followed in the consolidation of regional securities markets. If the scale economies in running an exchange are large, one could even plead for a *world* stock market. On the other hand, a federal model could be developed with various sub-exchanges (subsidiaries) that keep their own identity. When Euronext was established in 2000, following the introduction of the single currency, it turned out that the various national markets for stock trading survived the consolidation. A similar consolidation is found in Norex, the association of Scandinavian stock exchanges. In the latter case, one still has the choice to cross-list a firm's shares on various markets or not. These different models are evaluated in more detail hereafter. We doubt that the first M&A model is a good choice for international stock exchange consolidation, for three reasons:

First, Arnold *et al.* (1999) show that the regional exchanges in the USA have attracted market share and experienced narrower bid-ask spreads after merging, which may indicate that this consolidation process stimulated stock market competition. Yet, they also find that these gains did not affect the largest exchange, NYSE, but came at the expense of the smaller, regional markets that decided to stay independent. Given the importance of local stock market development for a country's long-term economic growth (e.g., Levine and Zervos, 1998), it is clear that the first type of consolidation model is likely to harm the economies of countries with smaller securities markets that are not (yet) involved in any stock market mergers.<sup>10</sup> Furthermore, we argue that particularly the smaller caps in those countries may find it difficult to continue to attract sufficient investor interest.

---

9 The NYSE Euronext merger is expected to further decrease transaction costs by 10–15% although the planned consolidation does not foresee in the full integration of these markets. Yet, critical voices say that stock exchanges are only responsible for 25% of total transaction costs whereas financial intermediaries represent 75%.

10 Besides, the countries that no longer have an own local stock exchange as a result of stock market consolidation, may suffer as well.

Stock exchanges that merge should invite more (cross-)listings by the larger companies in an economy that stays out of the exchange consolidation process, due to the lower transaction costs and higher liquidity in a larger-scale international stock exchange (e.g., Pagano *et al.*, 2001). For these large companies, an inclusion in the major market and industry indices has become increasingly important, as it is seen to have a clear impact on the trading of their shares. Foucault and Parlour (2004) also show that blue chips are more concerned about trading costs whereas smaller firms are interested especially in the level of listing fees (see also Corwin and Harris, 2001). Yet, listing costs are more related to the size and type of IPO candidate and hence are unlikely to be largely affected by stock market mergers. In addition, the fixed costs associated with internationalization make listing abroad relatively less appealing for the smaller firms in an economy. So, especially the largest companies in an economy that stays out of the exchange consolidation process, will be pulled towards the newly created stock exchange.

Importantly, Levine and Schmukler (2006) and Halling *et al.* (2006) find evidence of *migration* when firms cross-list abroad, i.e. the domestic trading of firms that cross-list or issue depositary receipts in foreign markets tends to decrease as a significant proportion of their trading activity concentrates in international financial markets. This may occur because international markets have lower information and transaction costs, more efficient risk pricing or lower settlement risk, for example.<sup>11</sup> Hence, large companies that move their stock market quotation or cross-list in the newly created exchange may negatively affect the turnover ratios of all companies listed in the domestic stock market. Chordia *et al.* (2000) indeed argue that stock liquidity is not simply an asset-specific attribute, but rather a characteristic that co-moves with market liquidity. With spillovers, the migration of trading of firms that finance themselves in international financial markets, could also increase the per-trade cost of domestic stock transactions. At the firm level, listing abroad might signal firm quality, which provides an additional mechanism linking internationalization with a drop in the liquidity of purely domestic firms. This will occur when listing abroad allows corporations to alleviate information and incentive problems, by bonding themselves into markets with greater disclosure requirements and stronger shareholder protection systems (e.g., Benos and Weisbach, 2004; Doidge *et al.*, 2004; Karolyi, 2006). Finally, if it becomes more desirable to trade securities in major international financial centers as a result of stock market mergers, then, as some firms from a country internationalize, investors may shift their trading of country risk out of purely domestic firms and into firms from that country that are traded internationally. Hence, the resultant shift in investor interest could hurt the liquidity of domestic firms substantially beyond the reduction in the domestic trading of international firms. When, consistent with the above arguments, *local* investors also shift their portfolios more towards the domestic firms in international securities markets, this will negatively affect especially the smallest firms in the home market, for which these investors typically have the largest information advantage.<sup>12</sup> In sum, when stock exchanges globalize, the smaller caps may find it more difficult to continue to attract sufficient (local) investor interest. This is problematic because, as argued in Section 2, the stock market is an important financing source especially for the small, young growth firms in an economy and/or it is typically used by venture capitalists as an exist mechanism.

---

11 However, firms that raise capital abroad without providing an easy vehicle for having their shares traded internationally tend to experience an increase, not a decrease, in their domestic trading activity.

12 Yet, according to Halling *et al.* (2006), the USA seem to have developed an expertise in analyzing small, volatile and high-tech companies.

A second reason why a full integration of stock markets is not a good consolidation model is that there is demand for exchanges with different specializations. The example of the NYSE-Nasdaq competition already showed that in spite of the NYSE's increased efforts to attract the largest technology companies, Nasdaq remains the primary listing venue for that type of companies (Corwin and Harris, 2001). So, exchanges seem to develop an expertise in the trading (and fair-price formation) of particular firms and industries, which gives them an advantage in the competition for listing. The recently merged NYSE Euronext, for example, will be strong in oil and financials and hence is unlikely to attract a lot of innovative and high-tech companies. Dealing with the demand for different specializations can be dealt with more easily by setting up a federal stock exchange model rather than a fully integrated stock market. When the same trading platform is used across the various sub-markets, the transaction costs of trading may still be substantially reduced also in this consolidation model. In the long run, one may wonder whether a specialization by industries is to be preferred over a stock exchange with geographical segments, given that IPO candidates seem to value exchange expertise in trading similar securities and hence prefer to (cross-)list in markets where other firms from their industry are already listed (e.g., Corwin and Harris, 2001; Pagano *et al.*, 2001). Current research seems to suggest that for most companies the advantages from the investor home equity bias are still dominating the advantages from industry clustering in the listing venue choice, however. Indeed, the number of cross-listings is still relatively small and the number of firms that list exclusively on a foreign market is even more limited (see Sercu (2007) for a more detailed discussion).

Third, the literature is full of examples showing that competition is beneficial, also in the stock exchange industry. Brown *et al.* (2006), for instance, study the stock exchange rivalry between the NYSE and the Consolidated stock exchange from 1885–1926. The Consolidated focused on the relatively liquid securities listed on NYSE, as measured by their bid-ask spreads and trading volume. When the Consolidated began trading NYSE stocks, the NYSE bid-ask spreads fell by more than 10%. Brown *et al.* conclude that the Consolidated may have improved the efficiency of stock prices by contributing to the price discovery process. Likewise, Gresse (2006) finds that crossing networks (CNs) have lowered the bid-ask spread on traditional dealer markets, regardless of the increased liquidity fragmentation. Gresse further observes that risk-sharing gains are directly related to dealer trading in the CN. She concludes that the benefits from risk sharing via CN trading dominate the fragmentation and cream-skimming costs. Foerster and Karolyi (1998) find that Canadian firms experiencing a significant shift in trading volume to the foreign exchange where their stock becomes cross-listed, also exhibit a substantial decrease in trading costs on the Canadian (home) market. Besides affecting trading costs, Dey (2005) shows that higher stock market competition leads to higher liquidity, despite the negative impact of fragmentation on liquidity. Finally, Tse and Erenburg (2003) point out that markets also specialize in transaction type following an increase in competition. For this purpose, they investigate what happened to the competition for order flow, market quality, and price discovery after the QQQ, an AMEX-listed exchange-traded fund, began trading on the NYSE in 2001. Overall, the greatest volume of trading takes place on electronic communications networks (ECNs), and then on the AMEX and the NYSE. While ECNs contribute most to the price-discovery process, most of the

block trades are executed on the AMEX, where bid-ask spreads are narrower. Yet, Tse and Erenburg further conclude that QQQ spreads on all trading platforms have decreased and market quality and price discovery have improved since QQQ shares started trading on the NYSE.

Given the above arguments, we can safely conclude that from the point of view of listed firms, intermediaries and investors, it is important that stock market mergers are *not* realized solely to eliminate competition.<sup>13</sup> Overall, we favor a federal stock market model, preferably at a global scale, which allows reducing trading costs to a large extent when one common trading platform is introduced. Simultaneously, this consolidation model guarantees that small and young growth firms continue to have access to their local investor base. The question that arises next is whether stocks should be listed on several sub-markets, for example through cross-listings. When these sub-markets are located in different time zones, then there is a clear logic to cross-list shares on multiple markets. Chakravarty *et al.* (2004), for example, focus on institutional factors like time-zone differences to explain the distribution of trading volume for foreign stocks cross-listed in the USA as ADR. They conclude that for stocks traded as both ADRs and in their respective local exchanges, trading volume in the domestic market is higher when trading hours are non-overlapping. Yet, when dual trading occurs in the same time zone, it can have opposite effects: on the one hand, market fragmentation could reduce market activity, liquidity, and exchange efficiency. On the other hand, competition between markets should induce dealers to offer cheaper transactions, for which the empirical support is abundant. In addition, Hamet (2002) shows that for French stocks traded on SEAQ International, market activity decreases significantly in the Paris Bourse during UK bank holidays. Thus, SEAQ-I market makers seem to divert a new clientele to the Paris Bourse, increasing both market activity and the breadth of the Paris Bourse's order book. Also, and again in contrast to the liquidity fragmentation hypothesis, dual trading does not seem to increase information asymmetries. Overall, the above results indicate that markets of different sizes and quality may have different gravitational pulls on the trading activity of cross-listed firms.

---

13      Nonetheless, we do have to point out that a few studies argue that even a *monopolist* exchange may be welfare-enhancing. Foucault and Parlour (2004), for example, argue that competition does not guarantee that exchanges choose welfare-maximizing trading rules. Consistent with this idea, Kam *et al.* (2003) find that after the NYSE repealed its Rule 390, which disallowed exchange members from trading stocks listed prior to April 26, 1979 *outside* of an exchange, a paradigm shift occurred in the way NYSE specialists make a market. Specifically, quoted spreads decreased by about 18% for Rule 390 stocks whereas effective spreads did not change. Kam *et al.* conclude that prior to the repeal, NYSE specialists set wider quotes but provided extensive price improvement whereas tighter quotes were set with lesser price improvement possibilities following the repeal. This shift was a strategic response by NYSE specialists to maintain market share, by making order flow internalization and payment for order flow less profitable. Indeed, the NYSE lost little market share, even in the smaller trades that were supposed to migrate following the repeal. Kam *et al.* (2003) conclude that competition still improved market quality, although in another way than expected *ex ante*.

On the whole, Halling *et al.* (2006) find that domestic stock trading in general does not suffer when a cross-listing occurs. Quite to the contrary, both around the cross-listing date and in the years thereafter the stock's turnover ratio in the domestic market increases significantly. Yet, they do find a striking difference between the experience of developed and emerging markets. For firms based in developed markets, the domestic turnover rate increases in the wake of cross-listing and remains permanently higher. In contrast, emerging-market firms exhibit a decrease in the level of domestic trading, a finding that accords with the evidence in Karolyi (2004) and Levine and Schmukler (2006). Karolyi (2004) documents for emerging-market companies cross-listed in the USA that an increase in ADR activity goes along with a decrease in the market capitalization and turnover ratios of purely domestically listed firms. Likewise, Levine and Schmukler (2006) examine the impact of the internationalization of stock exchange activities on the liquidity of the remaining firms in domestic markets using data from 45 emerging economies during 1989–2000. They find that the migration of cross-listed firms negatively affects the liquidity of the remaining firms in the emerging home market. This occurs through two separate channels. First, there are liquidity spillovers within markets: the aggregate domestic trading activity is positively related to the liquidity of individual firms in the same market (see also Chordia *et al.*, 2000). Second, the proportion of trading abroad is negatively related to the liquidity of firms in the domestic market. So, there is a close connection between the aggregate domestic trading of international firms and the liquidity of purely domestic firms. Hence, Levine and Schmukler conclude that internationalization is negatively associated with the liquidity of domestic firms *beyond* the migration-spillover channel, at least for companies in emerging markets. In sum, we conclude that cross-listings in a federal stock exchange model are to be encouraged, but only for companies from developed countries. These firms may gain from a cross-listing on an exchange that is specialized in their same industry. Governments in emerging markets, however, should be careful with stimulating the cross-listing of their listed enterprises. Yet, there are alternatives besides a cross-listing for emerging-market companies to raise equity in international financial markets (see also footnote 11).

## 6. CONCLUSIONS

Local stock market development is important for firms and economies. The question then arises whether *cross-border* stock market mergers should be opposed or even forbidden. In this debate, one has to take into account that the internationalization of stock exchange activities is a natural process that arises as countries grow and their institutions improve. Also, firms that access international financial markets win: raising funds abroad boosts the total trading of their stock and companies grow after a foreign (cross-)listing. Besides, stock market mergers are a natural response to deal with increasing internal and external competition in the stock exchange industry.

This paper has pointed out that listed firms, intermediaries and investors can gain from consolidating stock exchanges, provided that competition remains guaranteed. In particular, stock market liquidity can improve and trading costs can be reduced. Yet, these benefits are particularly advantageous to the largest companies in an economy; the smaller, young growth firms that wish to use the stock exchange

as a financing source and/or an exit mechanism for venture capitalists may actually suffer. The main reason is that these informationally opaque firms are the largest beneficiaries from the investor home equity bias. Hence, in this paper, we advocate a consolidation model that combines the best of two worlds for companies: a model that guarantees access to a local investor base and contributes to lower transaction costs and higher liquidity. We only point out that governments in emerging markets should be careful with stimulating their companies to cross-list abroad, but this is not to say that they should prevent the international funding of their largest firms.

## References

- Admati, A.R. and Pfleiderer, P., 1988, Selling and Trading on Information in Financial Markets, *American Economic Review* 78(2), 96-103.
- Aggarwal, R. and Angel, J.J., 1999, Optimal Listing Strategy: Why Microsoft and Intel Do Not List on the NYSE, working paper.
- Amihud, Y. and Mendelson, H., 1986, Asset Pricing and the Bid-Ask Spread, *Journal of Financial Economics* 17(2), 223-249.
- Arnold, T., Hersch, P., Mulherin, J.H. and Netter, J., 1999, Merging Markets, *Journal of Finance* 54(3), 1083-1110.
- Bacidore, J.M. and Sofianos, G., 2002, Liquidity Provision and Specialist Trading in NYSE-Listed Non-US Stocks, *Journal of Financial Economics* 63(1), 133-158.
- Baker, H.K. and Johnson, M., 1990, A Survey of Management Views on Exchange Listing, *Quarterly Journal of Economics* 29(4), 3-20.
- Baker, H.K., Powell, G.E. and Weaver, D.G., 1999, Does NYSE Listing Affect Firm Visibility? *Financial Management* 28(2), 46-54.
- Barclay, M.J., 1997, Bid-Ask Spreads and the Avoidance of Odd-Eighth Quotes on Nasdaq: An Examination of Exchange Listings, *Journal of Financial Economics* 45(1), 33-60.
- Benos, E. and Weisbach, M.S., 2004, Private Benefits and Cross-Listings in the United States: *Emerging Markets Review* 5(2), 217-240.
- Bertoni, F. and Giudici, G., 2003, 'New' Stock Markets in Europe: A 'New' Exit for Venture Capital Investments, *New Venture Investment: Choices and Consequences*, 201-225.
- Black, B.S. and Gilson, R.J., 1998, Venture Capital and the Structure of Capital Markets: Banks versus Stock Markets, *Journal of Financial Economics* 47(3), 243-277.
- Brennan, M.J., Cao, H.H., Strong, N. and Xinzhong, X., 2005, The Dynamics of International Equity Market Expectations, *Journal of Financial Economics* 77(2), 257-288.
- Brown, W.O., Mulherin, J.H. and Weidenmier, M.D., 2006, Competing with the NYSE, NBER Working paper 12343.
- Butler, A.W., Grullon, G. and Weston, J.P., 2005, Stock Market Liquidity and the Cost of Issuing Equity, *Journal of Financial and Quantitative Analysis* 40(2), 331-348.
- Chakravarty, S., Chiyachantana, C.N. and Jiang, C., 2004, The Choice of Trading Venue and Relative Price Impact of Institutional Trading: ADRs versus the Underlying Securities in their Local Markets, working paper Purdue University.
- Chordia, T., Roll, R. and Subrahmanyam, A., 2000, Commonality in Liquidity, *Journal of Financial Economics* 56(1), 3-28.
- Chordia, T., Shivakumar, L. and Subrahmanyam, A., 2004, Liquidity Dynamics across Large and Small Firms, *Economic Notes* 33(1), 111-143.

- Chowdhry, B. and Nanda, V., 1991, Multimarket Trading and Market Liquidity, *Review of Financial Studies* 4(3), 483-511.
- Christie, W.G. and Huang, R.D., 1994, Market Structure and Liquidity: A Transactions Data Study of Exchange Listings, *Journal of Financial Intermediation* 3(3), 300-326.
- Claessens, S., Klingebiel, D. and Schmukler, S.L., 2006, Stock Market Development and Internationalization: Do Economic Fundamentals Spur Both Similarly?, *Journal of Empirical Finance* 13(3), 316-350.
- Cornelli, F. and Goldreich, D., 2001, Bookbuilding and Strategic Allocation, *Journal of Finance* 56(6), 2337-2369.
- Corwin, S.A. and Harris, J.H., 2001, The Initial Listing Decisions of Firms that Go Public, *Financial Management* 30(1), 35-55.
- Coval, J. and Moskowitz, T.J., 1999, Home Bias at Home: Local Equity Preference in Domestic Portfolios, *Journal of Finance* 54(6), 2045-2073.
- Cowan, A., Carter, R., Dark, P.K. and Singh, A., 1992, Explaining the Listing Choices of Nasdaq Firms, *Financial Management* 21(1), 73-86.
- Cumming, D., Fleming, G. and Schwienbacher, A., 2006, Legality and Venture Capital Exits, *Journal of Corporate Finance* 12(2), 214-245.
- Degryse, H., Van Achter M. and Wuyts, G., 2007, Crossing Networks: Competition and Design, *Competition and Regulation in Network Industries*, forthcoming.
- Devereux, M.B. and Smith, G.W., 1994, International Risk Sharing and Economic Growth, *International Economic Review* 35(4), 535-550.
- Dey, M.K., 2005, Turnover and Return in Global Stock Markets, *Emerging Markets Review* 6(1), 45-67.
- Di Noia, C., 2001, Competition and Integration among Stock Exchanges in Europe: Network Effects, Implicit Mergers and Remote Access, *European Financial Management* 7(1), 39-72.
- Doidge, C.G., Karolyi, A. and Stulz, R., 2004, Why are Foreign Firms Listed in the US Worth More?, *Journal of Financial Economics* 71(2), 205-238.
- Economides, N., 1996, The Economics of Networks, *International Journal of Industrial Organization* 14(6), 673-699.
- Economides, N. and Schwartz, R.A., 1995, Equity Trading Practices and Market Structure: Assessing Asset Managers' Demand for Immediacy, *Financial Markets, Institutions and Instruments* 4(4), 1-46.
- Eun, C.S. and Sabherwal, S., 2003, Cross-Border Listings and Price Discovery: Evidence from US-Listed Canadian Stocks, *Journal of Finance* 58(2), 549-575.
- Foerster, S.R. and Karolyi, G.A., 1998, Multi-Market Trading and Liquidity: A Transaction Data Analysis of Canada-US Interlistings, *Journal of International Financial Markets, Institutions and Money* 8(3-4), 393-412.

- Foucault, T. and Parlour, C.A., 2004, Competition for Listings, *RAND Journal of Economics* 35(2), 329-355.
- Goergen, M., 1998, Corporate Governance and Financial Performance: A Study of German and UK Initial Public Offerings (Cheltenham, U.K. and Northampton, Massachusetts).
- Gomes, A., 2000, Going Public Without Governance, *Journal of Finance* 55(2), 615-646.
- Gresse, C., 2006, The Effect of Crossing-Network Trading on Dealer Market's Bid-Ask Spreads, *European Financial Management* 12(2), 143-160.
- Grinblatt, M. and Keloharju, M., 2000, The Investment Behavior and Performance of Various Investor Types: A Study of Finland's Unique Data Set, *Journal of Financial Economics* 55(1), 43-67.
- Habib, M.A. and Ljungqvist, A.P., 2001, Underpricing and Entrepreneurial Wealth Losses in IPOs: Theory and Evidence, *Review of Financial Studies* 14(2), 433-458.
- Halling, M., Pagano, M., Randl, O. and Zechner, J., 2006, Where is the Market? Evidence from Cross-Listings in the U.S., CEPR discussion paper no. 4987.
- Hamet, J., 2002, Is Off-Board Trading Detrimental to Market Liquidity?, *Financial Review* 37(3), 385-402.
- Högholm, K. and Rydqvist, K., 1995, Going Public in the 1980s: Evidence from Sweden, *European Financial Management* 1(3), 287-315.
- Huang, R.D. and Stoll, H.R., 1996, Dealer versus Auction Markets: A Paired Comparison of Execution Costs on Nasdaq and the NYSE, *Journal of Financial Economics* 41(3), 313-357.
- Huyghebaert, N. and Van Hulle, C., 2006, Structuring the IPO: Empirical Evidence on the Portions of Primary and Secondary Shares, *Journal of Corporate Finance* 12(2), 296-320.
- Ivkovic, Z. and Weisbenner, S., 2005, Local Does as Local Is: Information Content of the Geography of Individual Investors' Common Stock Investments, *Journal of Finance* 60(1), 267-306.
- Jeng, L.A. and Wells, P.C., 2000, The Determinants of Venture Capital Funding: Evidence Across Countries, *Journal of Corporate Finance* 6(3), 214-289.
- Kadlec, G.B. and McConnell, J.J., 1994, The Effect of Market Segmentation and Illiquidity on Asset Prices, *Journal of Finance* 49(2), 611-636.
- Kam, T.K., Panchapagesan, V. and Weaver, D.G., 2003, Competition among Markets: The Repeal of Rule 390, *Journal of Banking and Finance* 27(9), 1711-1736.
- Karolyi, G.A., 2004, The Role of American Depositary Receipts in the Development of Emerging Equity Markets, *Review of Economics and Statistics* 86(3), 670-690.
- Karolyi, G.A., 2006, The World of Cross-Listings and Cross-Listings of the World: Challenging Conventional Wisdom, *Review of Finance* 10(1), 99-152.

- Levine, R., 1991, Stock Markets, Growth and Tax Policy, *Journal of Finance* 46(4), 1445-1465.
- Levine, R., 1997, Financial Development and Economic Growth: Views and Agenda, *Journal of Economic Literature* 35(2), 688-726.
- Levine, R., 2005, Law, Endowments and Property Rights, *Journal of Economic Perspectives* 19(3), 61-88.
- Levine, R. and Schmukler, S.L., 2006, Internationalization and Stock Market Liquidity, *Review of Finance* 10(1), 153-187.
- Levine, R. and Zervos, S., 1998, Stock Markets, Banks, and Economic Growth, *American Economic Review* 88(3), 537-558.
- Luybaert, M. and Huyghebaert, N., 2007, Determinants of Growth through Mergers and Acquisitions: An Empirical Analysis, working paper, K.U.Leuven.
- Malloy, C.J., 2005, The Geography of Equity Analysis, *Journal of Finance* 60(2), 719-755.
- Merton, R.C., 1987, A Simple Model of Capital Market Equilibrium with Incomplete Information, *Journal of Finance* 42(3), 483-510.
- Michelacci, C. and Suarez, J., 2004, Business Creation and the Stock Market, *Review of Economic Studies* 71(2), 459-481.
- Mitchell, M.L. and Mulherin, J.H., 1996, The Impact of Industry Shocks on Takeover and Restructuring Activity, *Journal of Financial Economics* 41(2), 193-229.
- Obstfeld, M., 1994, Risk-Taking, Global Diversification, and Growth, *American Economic Review* 84(5), 1310-1329.
- Pagano, M., 1989, Trading Volume and Asset Liquidity, *Quarterly Journal of Economics* 104(2), 255-274.
- Pagano, M., Panetta, F. and Zingales, L., 1998, Why Do Companies Go Public. An Empirical Analysis, *Journal of Finance* 53(1), 27-64.
- Pagano, M., Röell, A.A. and Zechner, J., 2001, What Makes Stock Exchanges Succeed? Evidence from Cross-Listing Decisions, *European Economic Review* 45(4-6), 770-782.
- Pagano, M. and Steil, B., 1996, The Evolution of European Trading Systems, in Steil, B. (ed), *The European Equity Markets: The State of the Union and an Agenda for the Millennium*, London: Royal Institute of International Affairs; Copenhagen: European Capital Markets Institute; distributed by Brookings Institution, Washington, D.C., pp. 409.
- Powell, R. and Yawson, A., 2005, Industry Aspects of Takeovers and Divestitures: Evidence from the UK, *Journal of Banking & Finance* 29(12), 3015-3040.
- Quan, Q. and N. Huyghebaert, 2007, Interdependencies between European, US and Japanese Stock Markets: Did the Euro Promote Further Integration?, *International Economics and Finance Journal*, forthcoming.

Sarkissian, S. and Schill, M.J., 2004, The Overseas Listing Decision: New Evidence of Proximity Preference, *Review of Financial Studies* 17(3), 769-809.

Sercu, P., 2007, *International Finance*. Putting Theory to Practice, Princeton University Press, forthcoming.

Sherman, A.E., 2000, IPOs and Long-Term Relationships: An Advantage of Bookbuilding, *Review of Financial Studies* 13(3), 697-714.

Tse, Y. and Erenburg, G., 2003, Competition for Order Flow, Market Quality, and Price Discovery in the NASDAQ 100 Index Tracking Stock, *Journal of Financial Research* 26(3), 301-318.

Van Ness, B.F., Van Ness, R.A. and Warr, R.S., 2005, The Impact of Market Maker Concentration on Adverse-Selection Costs for Nasdaq Stocks, *Journal of Financial Research* 28(3), 461-485.