INTRA-COUNTRY REGULATION OF SHARE MARKETS: DOES ONE SIZE FIT ALL?[*]

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Abstract

A large body of evidence suggests that financial development is greater in countries that impose stricter regulatory requirements on their major stock exchanges, but this leaves open the question of whether or not such regulation should be uniformly applied to all equity trading platforms *within* a country. On the one hand, regulatory variation permits a wider choice of investment opportunities for investors, lowers the cost of capital for some firms, and enhances price discovery and efficiency. On the other hand, the presence of lightly regulated exchanges can potentially have adverse spillover implications for a country's other financial markets.

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1. Introduction

In December 2004, the New Zealand Minister of Commerce announced her intention to subject share trading platform Unlisted to the provisions of section 36B of the Securities Markets Act, effectively placing it on the same regulatory footing as registered stock exchange NZX. Prior to this announcement, Unlisted had, for the previous year, provided an unregistered trading facility for the securities of firms unable or unwilling to meet the costs and requirements of listing on NZX. Trading on Unlisted offered only basic regulatory protection to investors: although standard companies and securities provisions applied to Unlisted's issuers, they were not subject to insider trading laws, continuous disclosure requirements, or relevant director interest disclosures. After hearing submissions from interested parties, the government ultimately determined that the relevant statutory tests for regulating Unlisted were not satisfied. However, it also served notice that it may revisit the issue if Unlisted is successful in attracting significant numbers of companies and investors.

This episode raises an interesting question that has largely gone unaddressed in the academic literature: should all share trading facilities in a given country be required to provide similar investor protection coverage, or should variation be allowed? Such a question has become relevant due to organised markets like Unlisted – that are designed to assist the trading of unlisted securities – becoming more common. Traditionally, shares that were not listed on a major exchange could only be traded via decentralised 'over-the-counter' arrangements

involving company administrators or private transactions.[1] More recently however, centralised platforms have arisen to facilitate trading in securities that might otherwise have only been available over-the-counter. Such platforms offer many of the trading facilities offered by traditional exchanges, but in some cases are subject to weaker regulation. For example, in the United States, both the OTC Bulletin Board and The Pink Sheets, particularly the latter, face fewer regulatory requirements than registered exchanges such as NYSE and NASDAQ.[2] Similarly, in the United Kingdom the LSE operates its more lightly-regulated Alternative Investment Market (AIM) which has proven attractive to United States and other foreign companies seeking the benefits of liquidity without high levels of compliance costs. Other countries, however, such as Australia, impose regulatory standards similar to that required of the major exchange. And standards applied to different markets can vary over time: in the United Kingdom, for example, OFEX began life in 1995 as an unregulated trading facility for unlisted securities, but subsequently, in 2002, became a prescribed market regulated by the Financial Services Authority.[3]

Share market regulation thus differs not only across countries, but also, at least in some cases, *within* countries as well. Inevitably, the presence of intra-country regulatory variation has resulted in calls for uniformity, particularly given that traditional exchanges often have a vested interest in such a step. In this paper, we discuss the case for regulatory variation and cast a critical eye on the arguments raised for uniformity. To set the scene, we first, in the next section, review the inter-country evidence on the relationship between financial regulation and market development. Although this evidence suggests that countries benefit from adopting

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[1] Such arrangements offered little explicit investor protection, largely because participation required considerable effort on the part of investors, who were thus assumed to be sophisticated and knowledgeable.

[2] For details on the differences between these markets, see Bushee and Leuz (2005).

[3] The regulatory requirements imposed on OFEX issuers are, nevertheless, arguably weaker than those applied to AIM issuers.

stringent regulatory standards, other interpretations are possible. Subsequent sections consider the main benefits and costs of allowing, or not allowing, variation in the rules and regulations applicable to different equity trading platforms within countries.

2. Regulation and the development of financial markets

All major stock markets are subject to regulations that, among other things, specify required information disclosure by firms, define restrictions on insider trading, and impose constraints on corporate governance choices.[4] Traditionally, economists have considered such regulations to be largely unnecessary and possibly harmful.[5] According to this view, investors analyse and process available information to accurately determine firm value, so firms have an incentive to disclose information in order to obtain the best price they can for the securities they issue. Failure to disclose information, or otherwise behave capriciously, leads to suspicion on the part of investors and the attribution of additional risk premia. Moreover, any difficulties in verifying the accuracy of disclosed information can be mitigated by standard legal mechanisms. As a result, regulation at best simply reinforces existing market arrangements; at worst it impedes these arrangements and adds to the cost of investment.

An alternative view holds that share market regulation is beneficial to firms and investors.[6] The underlying idea is that regulation reduces asymmetric information problems and the threat of minority shareholder expropriation, thereby encouraging investors to participate in capital markets and thus facilitating the development of these markets. Supporting this view, recent research has uncovered a positive correlation between indices of

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[4] For a review of the pros and cons of mandatory disclosure requirements, see Bushee and Leuz (2005); for a discussion of the merits of insider trading restrictions, see Bainbridge (2000) and Bhattacharya and Daouk (2002). A large number of papers have assessed the effects of the corporate governance provisions in the United States Sarbannes-Oxley Act – see, for example, Romano (2005).

[5] See, for example, Stigler (1964).

[6] See Black (2001) for legal discussion, or Shleifer and Wolfenzon (2002) for economic analysis.

investor protection regulation and several metrics of financial market development, including market capitalisation, number of listed firms, ownership concentration, liquidity, and cost of capital. The magnitude of these effects, based on La Porta et al (2006) and Hail and Leuz (2006), is summarised in Table 1 where we report the average change in these development measures as the result of moving from the 10th to the 90th regulatory percentile (approximately the difference between Greece and Canada as of December 2000). Depending on the precise measure of investor protection regulation and the empirical method employed, such a shift is associated with an increase in the market capitalisation to GDP ratio by between 0.15 and 0.39, the annual market turnover to GDP ratio by between 0.24 and 0.65, and a decrease in the cost of equity capital of up to 3.4 percentage points.

Table 1 Financial market development and regulation

Measures of financial Development	Mean effect of increasing regulation index from the 10th to the 90th percentile
Market capitalisation/GDP	15 to 39 percentage points
Firms per capita	28% to 74%
Ownership Concentration	-2 to -13 percentage points
Turnover/GDP	24 to 65 percentage points
Cost of equity	
all countries	-100 to -340 basis points
countries with open capital markets	0 to -100 basis points

One interpretation of the evidence reported in Table 1 is that, as La Porta et al (1999, p32) put it, "...leaving financial markets alone is not a good way to encourage them." According to this view, market trade and growth are facilitated by regulation designed to protect investors, and more such regulation is better than less. This being the case, the

existence of share trading platforms that are subject to little or no regulation, even in countries that simultaneously offer extensively regulated opportunities on their major stock exchange, is of doubtful benefit. Allowing such platforms discourages investor participation in a potentially significant proportion of a country's productive sector and hence retards investment and growth; it might also have adverse implications for the health of the regulated stock market.

One difficulty with this view is that interpretation of the Table 1 evidence is by no means unambiguous. While revealing a clear association between financial market development and the presence of regulation, it sheds little light on the exact process by which this occurs and thus cannot rule out reverse causality. For example, greater investor participation in stock markets may lead to increased demand for regulation that protects such investments, i.e., stock market growth 'causes' stronger regulation. Although Glaeser et al (2001) attribute the differing experiences of Poland and the Czech Republic during the 1990s to different regulatory systems, other evidence suggests that financial market growth and development can precede extensive government regulation and oversight. For example, Franks et al (2005) point out that extensive regulation does not seem to have been a necessary condition for the emergence of a flourishing stock market in the United Kingdom during the first half of the twentieth century. In particular, they note that investor protection was rather weak during that period, but that the stock market was both large and active. Moreover, greater regulatory protection in the second half of the century had little effect on equity issuance or ownership concentration. Similarly, Day (2006) describes how reputational considerations were sufficient for the New York stock market to grow and prosper during the largely unregulated 19th century. Finally, Rajan and Zingales (2003) argue that stock markets were, by most measures, more developed in 1913 than in 1980, and that development actually went into reverse between 1930 and 1970 – a period characterised by the imposition of stronger and more widespread regulation. All three of these studies call into question the causative link running from regulation to financial market development.

In the end, it remains unclear whether investor protection regulation causes, or is caused by, financial market development. At best, the evidence in Table 1 indicates that regulation assists the development of major, and frequently monopolistic, stock exchanges. However, it reveals little about whether or not a given *country* can benefit from allowing less-regulated trading platforms to exist alongside traditional exchanges. Even if the *provision* of tightly regulated investments and trading is in a nation's best interests, it need not follow that offering *only* tightly regulated opportunities is optimal. Less regulation may indeed allow greater expropriation of minority shareholders (see Result 1 of La Porta et al 2002), but some investors may nevertheless wish to avail themselves of such opportunities because of the potentially attractive rewards they offer, just as some investors are prepared to pay the high fees of hedge funds in order to gain access to the promised high returns. We turn to this issue in the next section.

3. Benefits and costs of intra-country variation in the regulation of equity trading opportunities

As is frequently the case in regulatory discussions, it is relatively easy to envisage situations where allowing intra-country variation in equity market regulation could potentially have adverse consequences, whereas the benefits from doing so are perhaps a little more abstract. We first describe these benefits, and then consider the costs of allowing for variation.

3.1 Benefits of intra-country variation in the regulation of equity trading opportunities

There are two principal reasons for allowing variation in the regulatory treatment of organised trading platforms. First, it potentially provides firms with access to cheaper financing. Second, it provides investors with a more attractive set of investment opportunities. We discuss each of these in turn.

Firms

By reducing information asymmetries and the risk of small shareholder expropriation, financial market regulation lowers the risk premium that investors require in order to hold a company's

securities and hence raises firm value. But meeting extensive regulatory requirements is not costless and for some firms these costs may outweigh the gains from a lower cost of capital. In the absence of a lightly-regulated trading facility, firms face a simple listing choice: incur the regulatory costs of listing on a traditional exchange or accept the risk and liquidity premia associated with over-the-counter trading and the corresponding lower value of their securities. However, as Table 2 summarises, firms that are unable to justify the costs of listing on a traditional exchange, and thus would otherwise have opted for over-the-counter trading, benefit from the existence of an alternative, less-regulated, trading platform, since the greater liquidity of such a platform reduces the risk and liquidity premia to which their securities are subject. As a result, such firms obtain a reduction in their cost of capital without any corresponding increase in regulatory costs, thereby increasing their value.[7]

Table 2

Trading Platform Costs and Regulatory Coverage

Costs incurred by firms in choosing among the different types of trading platform.

	Trading Platform	
Traditional Exchange (regulated)	Alternative Centralised (lightly regulated)	Decentralised (OTC)
Regulatory costs	Risk premium	Risk premium Liquidity premium

Investors

Turning to investors, regulation lowers the risk of stock market investment and thus facilitates participation by risk averse individuals who might otherwise avoid the market altogether. But *some* investors may desire the high expected returns associated with lightly regulated firms,

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[7] Giving firms the ability to opt for listing on an organised trading platform without having to incur the costs of full regulatory compliance also encourages competitive efficiencies, since it provides traditional exchanges with an incentive to minimise the costs of listing and rule compliance – see Rust and Hall (2003).

and the diversification opportunities they provide, even though they know that such firms tend to be less investor friendly than other firms. Consequently, if the same level of regulation is applied to all stocks traded on organised platforms, such investors may be unable to achieve their desired combination of risk and return without incurring increased costs and/or significant loss of liquidity. In the language of modern finance, allowing lightly-regulated trading platforms to co-exist with traditional exchanges more effectively completes the market.

Although highly risk-averse investors will tend to shun lightly-regulated platforms, more risk tolerant investors gain from being able to trade on such platforms, a benefit they would lose if all trading facilities were subject to the same rules and regulations. Thus, allowing for variation in regulatory requirements permits an aggregate welfare improvement: investors with relatively low risk aversion can be better off under regulatory variation while more risk-averse investors are no worse off than they would be under uniform regulation (since they can choose not to participate in the lightly regulated platform).[8] In short, risk-tolerant investors who wish to hold securities that offer only weak regulatory protection are able to do so without being forced to accept an illiquid position, and without imposing any costs on more risk-averse investors.[9]

Of course, this apparent benefit is subject to a significant caveat: that lightly-regulated platforms do not inadvertently attract highly risk-averse investors who, unaware of the risks involved, end up placing their funds in 'inappropriate' investments. This issue often arises in debates on deposit insurance for banks, where it is sometimes claimed that small investors are ill-equipped to monitor and assess bank soundness (see, for example, Kareken 1990, White 1995). Whatever the merits of this view with respect to banks, it seems to have less force when applied to equity trading platforms, for at least two reasons. First, the number of affected investors is far smaller, making them less systemically important. Second, investors who participate in less-regulated platforms are sophisticated enough to locate and access what

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[8] Greenstone et al (2006) note that 1964 legislation imposing tougher disclosure requirements on United States over-the-counter securities was associated with abnormal excess returns on those securities, suggesting that investors valued the stronger requirements, at least initially.

[9] This may not be true if the presence of a lightly-regulated trading platform attracts migration of firms from the more heavily-regulated platform, We address this point in more detail later in this section.

are typically low-profile markets, so it seems unlikely that many of them are also sufficiently naïve and ill-informed to require protection from the consequences of their investment decisions.[10]

Efficient allocation of capital requires that investments be priced commensurate with the risks they carry, so a more sophisticated version of the 'investor protection' caveat revolves around whether or not investors who trade on the lightly-regulated platforms are able to correctly price the risks involved and thus receive adequate *ex-ante* compensation. If this is not the case, then the resulting resource misallocation may significantly reduce the benefits of allowing lightly-regulated investment opportunities. However, investors do seem able to rationally price the kinds of risks that are typical of securities that trade on less-regulated platforms. For example, Kerins et al (2004) report that expected returns on high-technology IPOs are much greater than on traditional stock portfolios, while Acharya and Pedersen (2005) find that United States investors require a higher expected return on illiquid stocks.

3.2 Costs of intra-country variation in the regulation of equity trading opportunities

The primary reason for not allowing intra-country variation in regulation is the existence of so-called spillover effects. These refer to negative externalities that the operations of a lightly regulated trading platform may impose on other markets (such as a traditional exchange), thus inhibiting overall financial development. There are three main routes by which such spillovers might occur.

Race to the bottom

If firms opt to migrate from the tightly-regulated traditional exchange platform to a lightly-regulated trading facility, then risk-averse investors who desire regulated investment opportunities may be forced to choose a sub-optimal securities portfolio, thereby undermining the beneficial effects of regulation. Moreover, the potential for such migration may induce a

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[10] Additional steps are sometimes taken to segregate investors and investments. For example, should naïve investors inadvertently attempt to access Unlisted's website, they must first declare that they have read and understood a prominent disclaimer regarding the company's regulatory status before they can proceed any further.

'race to the bottom' in terms of listing standards, further restricting the choices available to investors.

However, both theory and evidence suggest that these concerns can be over-stated. Chemmanur and Fulghieri (2006) show that reputational concerns discipline a market's choice of listing standards and, therefore, that the most likely outcome is an endogenous segmentation of trading platforms: heavily regulated, high-reputation traditional exchanges coexist with lightly regulated, low reputation alternative trading facilities. Indeed, as these authors point out (p483), adoption of a 'one-size-fits-all' approach "…may affect the economic viability of value-maximizing exchanges, since in order to survive, (these exchanges) need the flexibility to optimally tailor their listing standards to their pool of applicant firms, with the quality of this pool varying as a result of competitive pressures from other exchanges."

Consistent with this prediction, the emergence of alternative trading platforms has not been associated with any weakening of listing standards on major exchanges. Indeed, firms seem to much prefer the greater visibility and liquidity of listing on a traditional exchange and choose alternative platforms only if they have no viable alternative, or if they wish to avoid outside monitoring and it is cost-efficient to do so (see Leuz et al, 2007). For larger firms in particular, the lower cost of capital attainable from listing on a traditional and regulated exchange far outweighs the costs from having to comply with greater regulatory requirements.

Contagion

A second source of spillover costs might come from investors in a regulated market reacting negatively to an adverse event on a less regulated market – the so-called contagion effect. In this scenario, the collapse of a firm on the less regulated market causes investors to also lose confidence in the more regulated market, prompting a rash of selling in the shares of healthy firms.

There are several reasons to be cautious about this argument. First, while contagion is a much-feared and discussed theoretical phenomenon, financial markets seem to be fairly resilient in practice, even to within-market shocks. It is not uncommon for a listed firm to fail,

yet this rarely has any lasting effect on the overall health of the market on which its securities were traded. But if the collapse of an individual firm does not trigger problems in its own market, it seems unlikely that it would have any significant effect on another, more tightly-regulated, market. Indeed, as Longstaff (2004) shows, to the extent that a loss of confidence in a lightly regulated market induces a flight to quality and/or liquidity, a heavily regulated trading platform can actually benefit from difficulties in a less regulated market.

Second, where cross-market collapses have occurred, Kaminsky et al (2003) note that these have typically been precipitated not by the collapse of a single firm, but rather by significant macroeconomic shocks (such as government defaults or exchange rate depreciations). This point seems particularly salient to within-country contagion: firms listed on platforms other than the traditional exchange are almost always relatively small and economically insignificant, and so are most unlikely to have any impact on the broader market.

Third, Kodres and Pritsker (2002) show that difficulties in a market characterised by significant information asymmetries are far more likely to flow through to other low-information securities than to those that trade in markets where information problems are weaker. In other words, although the failure of one or more firms listed on a lightly-regulated trading platform can, in certain circumstances, have adverse implications for other lightly-regulated platforms (or for other securities traded on the same platform), there is little chance of problems arising on a more heavily-regulated traditional exchange.

Finally, the contagion argument also seems inconsistent with the principal rationale for regulation of financial markets: that, as seen in Table 1, investors rationally require compensation to induce them to participate in markets with weak regulation, thereby inhibiting the development of these markets. Contagion, on the other hand, requires that investors irrationally discount the price of shares traded on traditional exchanges. In other words, investors are rational enough to correctly price the benefits of regulation, but not rational enough to ignore irrelevant events for regulator-protected securities.

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Confusion

A third possible problem with platform-specific regulation is that it may cause confusion in the minds of investors, particularly offshore investors, about the regulatory status of any particular security, thereby discouraging them from participating in even heavily-regulated markets. As a result, the country's financial development is retarded, with resulting negative implications for investment and growth. In short, according to this view, diversity in regulation creates adverse selection problems for offshore investors, causing them to assume the worst about all securities regardless of the actual regulatory protection afforded any particular security.[11]

Although this issue has received scant attention in the literature, the little evidence that exists is not very supportive of the 'confusion' argument. One way to see this is to note that if a *possible* lack of sufficient investor protection (because of confusion created by intra-country regulatory heterogeneity) is sufficient to reduce foreign participation in a country's capital markets, then an *actual* lack of investor protection must certainly do so. Thus, a minimum implication of the 'confusion' argument is that offshore investors should invest less in the markets of countries with weaker regulation. However, after controlling for information transparency, Gelos and Wei (2005) report a significantly *negative* relationship between mutual fund investment in emerging countries and shareholder protection in those countries.

To take this idea a step further, we investigate the relationship between foreign ownership of a country's major stock market and the regulatory protection provided in that market. If regulatory variations do induce shifts in the quantity of investment, then we should observe a positive relationship between these two variables. For this analysis, we use data from two sources. First, as a measure of foreign ownership, we use the information on U.S. investors' 1997 foreign stock holdings (as a percentage of shares readily available for trading) reported in Leuz et al (2005). Second, as measures of regulatory coverage, we use two indexes described in Hail and Leuz (2006). DISREQ is a an index (ranging from 0 to 1) of the level of mandatory disclosure requirements in each country; SECREG is a broader index (ranging from

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[11] Foreign investors might suffer disproportionately from information problems because local investors are, or can more easily be, better informed about local firms' governance, management and prospects. See Leuz et al (2005).

0 to 1) of the level of mandatory disclosure requirements and the strength of private and public enforcement institutions in each country. To determine whether regulatory protection is important for stock market participation, we regress US foreign stock holdings on each of the two regulation variables.

Table 3   Regressions of US Portfolio Investment on Investor Protection Regulation

The dependent variable is 1997 US investor holdings of each of 27 foreign country stock markets as a percentage of shares readily available for trading; data are available in Leuz et al (2005). DISREQ is an index (ranging from 0 to 1) of the level of mandatory disclosure requirements; SECREG is an index (ranging from 0 to 1) of the level of mandatory disclosure requirements and the strength of private and public enforcement institutions. Both regulation indexes come from Hail and Leuz (2006). Size is the mean value (in USD million) of total assets for firms in each country. t-statistics based on OLS regressions are in parentheses; * (**) denotes significance at the 5% (1%) level.

Independent Variable	(1)	(2)	(3)	(4)
Intercept	23.0 (3.5)**	17.27 (2.5)*	14.6 (1.8)	6.5 (0.8)
DISREQ	-17.2 (1.7)		-10.0 (0.9)	
SECREG		-9.8 (0.8)		1.3 (0.1)
Size			0.01 (1.6)	0.01 (2.0)*
R^2	0.10	0.02	0.19	0.16

The results of this exercise appear in Table 3. Models (1) and (2) find no significant relationship between US demand and foreign stock market regulation; indeed, what relationship there is goes in the wrong direction. If anything, therefore, investors seem to

desire greater risk with their offshore investments, possibly because this offers greater diversification benefits with their domestic holdings. In models (3) and (4), we also include average firm size as a control variable in case US investors have a tendency to invest relatively more in bigger markets, but the regulation variables remain economically and statistically insignificant.

The absence of controls for other factors that may affect US investor demand means that the results of this analysis need to be interpreted with caution. Nevertheless, the failure to observe any significant bivariate correlation between US investor demand and regulatory indexes, together with the similar findings of Gelos and Wei (2005), at a minimum suggests that variation in regulatory protection does not affect foreign investor demand in a simple manner.

Finally, Kelly and Woidtke (2005) find that direct foreign investment by multinational firms is greatest in countries with weak regulation. As they point out, this evidence suggests that market mechanisms can mitigate potentially-adverse effects of limited investor protection, a view supported by Table 3.

4. Dynamic and unintended consequences of adopting a 'one-size-fits-all' intra-country approach

The emergence of alternative trading platforms has seen, as the Unlisted case illustrates, calls for these platforms to be regulated in the same way as traditional registered exchanges. Suppose one starts from a position where a traditional exchange exists side-by-side with a less-regulated trading platform. An issue that is not addressed anywhere above, but which is nevertheless important, is as follows: what is the appropriate test for determining whether the alternative platform should be subject to the same level of regulation as the traditional exchange? That is, how should the pros and cons outlined in previous sections be balanced against each other?

Traditional cost-benefit analysis requires only that the expected benefits of doing so exceed the expected costs. However, legislation is typically much easier to pass than to repeal,

so even regulation that quickly reveals obvious harm is likely to stay in place for some time. In other words, regulation is at least partially irreversible. By analogy with the irreversible investment literature (see, for example, Dixit and Pindyck 1994), such a phenomenon can have significant implications for the appropriate test.[12]

To formalise this idea, we can think of the regulator as having the perpetual right to subject all centralised trading platforms to the same regulation. At each date, the regulator observes the present value B of a stream of future expected benefits (e.g., less investor confusion and lower potential for harmful contagion) from uniform regulation and the present value C of a stream of future expected costs (e.g., less choice for investors and firms, and less competition among trading platforms). At any time, the regulator can choose to impose uniform regulation, thereby generating the net social payoff (B-C). As we show in the appendix, such a step is justified if and only if

$$B \geq \lambda C$$

where $\lambda > 1$ represents a waiting premium. To the extent the regulation is irreversible, there is value in waiting to acquire more information about the uncertain benefits of proceeding. As a result, the estimated benefits of regulating must not just exceed costs, but must do so by a factor reflecting the additional indirect costs of irreversibility. The more uncertain the benefits, the greater the value of exercising regulatory caution.

The important insight of this result is that dynamic effects resulting from the imposition of uniform regulation must also be taken into consideration. Unless the estimated benefits of uniform regulation are clearly, and significantly, greater than the costs, then restraint is justified. Indeed, the above test potentially understates the necessary caution insofar as it implicitly assumes the initial existence of an alternative trading platform. Because innovation and investment in such platforms is also irreversible, the *risk* of future regulatory intervention can discourage their development in the first place. The imposition of uniform regulation thus

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[12] See Parisi et al (2004) for a detailed discussion of the relevance of this principle to legislation in general.

makes it less likely that alternative platforms will arise in the future even if the regulation is repealed, a dynamic consideration that effectively raises λ further.

Even ignoring these dynamic consequences, attempts to impose uniform regulation on equity trading platforms have the usual potential for unintended consequences. A common justification for regulatory convergence is that it provides better protection for small investors. As discussed in the previous section, the protection of *individual* investors is not in and of itself a sufficient reason for regulatory intervention. However, even if there were some systemic, and therefore compelling, reasons for protecting small investors, it is by no means clear that imposing a uniform standard of regulation will assist in achieving this goal. Implicit in the argument that regulatory convergence is useful is the assumption that firms that currently list on an alternative platform will choose to remain on that platform once it is subject to full regulatory coverage, rather than revert to over-the-counter trading – which is largely unregulated, inhibits price discovery, and provides even less protection to small investors. The existing evidence suggests a degree of pessimism about this assumption. Bushee and Leuz (2005) report that 2677 firms (almost 50% of the total) were removed from the OTC Bulletin Board following the adoption of stricter disclosure requirements in 1999, while Leuz et al (2007) and Marosi and Massoud (2007) find that the number of firms voluntarily deregistering from major United States exchanges increased significantly following the introduction of stronger regulatory requirements in 2000-2002. As Bushee and Leuz (p.235) put it, it seems that "an important consequence of (stronger regulation) is to push smaller firms with lower outside financing needs into a less regulated market, rather than to compel them to adopt higher disclosure standards."

Even to the extent that firms do remain on an organised trading platform, this may not have the desired impact on overall financial development. As the model of Danielsson and Zigrand (2007) demonstrates, investors with an appetite for lightly regulated securities may simply quit the country altogether, leaving other investors to hold riskier portfolios than they would otherwise have chosen. To induce them to do so, these investors must be offered a higher expected rate of return, thereby increasing the firms' cost of capital and negating the benefits expected from more stringent regulation.

5. Concluding remarks

Considerable evidence exists to suggest that investor protection regulation assists the development of a country's traditional, and frequently monopolistic, stock exchange. However, giving firms the option to list on alternative trading platforms that are subject to lighter regulation may confer additional benefits: investors can access a wider range of investment opportunities without foregoing significant liquidity, firms can lower their cost of capital without incurring significant regulatory costs, and traditional exchanges are subject to competitive discipline.

Such benefits could turn out to be illusory if the existence of less-regulated platforms imposes negative externalities on a country's major exchange. However, the proposed mechanisms by which such spillover effects might occur are not particularly convincing, and currently lack empirical support.

Of course, the relatively short history of alternative trading platforms means that many of their implications and consequences remain to be fully explored, and research of this kind may ultimately identify significant spillover mechanisms or suggest other plausible reasons for subjecting these platforms to the same level of regulation as traditional exchanges. Until such evidence becomes available, however, calls for uniformity of regulation should be treated with a degree of scepticism.

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Appendix: Determining the appropriate test for the imposition of uniform regulation

The value B of the future expected benefits stream is uncertain and evolves according to the geometric brownian motion process

$$dB = \mu B \, dt + \sigma B \, d\xi \tag{A1}$$

where μ and σ are constant parameters and $d\xi$ is a Wiener process. To keep things as simple as possible without losing anything essential, we assume the value C of the future expected costs stream is fixed.

The regulator has a perpetual option on the payoff $(B\text{-}C)$. Let the value of this option be denoted by $F(B; B^*)$, where B^* is the optimal stopping value, i.e., the value of B at which uniform regulation is justified. The Bellman optimality principle implies

$$E[dF] = \rho F dt \tag{A2}$$

where ρ is a discount rate. Applying Ito's Lemma to F and using (A1), equation (A2) can be written as

$$\frac{1}{2} \, \sigma^2 B^2 \, F'' + \left(\rho - \delta\right) VF' - \rho F = 0$$

where $\delta = (\mu - \rho)$. Solving this differential equation yields

$$F(B; B^*) = \left(B^* - C\right) \left(\frac{B}{B^*}\right)^{\gamma}$$

where

$$\gamma = \left(\frac{1}{2} - \frac{r - \delta}{\sigma^2} \right) + \sqrt{\frac{2r}{\sigma^2} + \left(\frac{1}{2} - \frac{r - \delta}{\sigma^2} \right)^2} \ > 1$$

Maximising F in the usual way then provides the solution for B^*:

$$B^* = \lambda C$$

where $\lambda \equiv \frac{\gamma}{\gamma - 1} > 1$ ‖