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École affiliée à l'Université de Montréal

Essais sur la gouvernance et sur la privatisation

Par

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Résumé de la thèse

Cette thèse comprend deux essais sur des thèmes distincts : (1) la gouvernance d'entreprise et (2) la privatisation.

Dans le premier essai intitulé « Does Competition Matter for Corporate Governance? The Role of Country Characteristics », nous étudions la relation entre la concurrence sur le marché des produits (compétition) et la gouvernance d'entreprise. Nous nous intéressons à l'influence des caractéristiques-pays sur cette relation et à l'impact de la gouvernance d'entreprise sur la valeur de l'entreprise dans un contexte de compétition. Nous choisissons explicitement trois caractéristiques-pays fréquemment utilisés dans la littérature. Ce sont le niveau de développement économique, le niveau de développement financier et le degré de protection des investisseurs.

Les études empiriques sur la compétition et sur la gouvernance sont d'actualité. La gouvernance se définit comme les moyens par lesquels les actionnaires s'assurent d'un rendement sur leurs investissements. Elle est constituée d'un ensemble d'outils mis en place par les dirigeants pour assurer la protection des droits de propriété des actionnaires. Il ressort de la littérature théorique et empirique que des facteurs externes peuvent influencer la mise en place de ces outils de protection et ainsi renforcer la sécurité financière des actionnaires. En fait le principe de la bonne gouvernance est d'inciter le gestionnaire à travailler pour le bien-être des actionnaires. Hart (1983) démontre que la compétition sert à discipliner le gestionnaire. En effet, dans un milieu compétitif, les profits sont réduits et un mauvais gestionnaire court le risque de perdre son

poste si les compétiteurs font mieux. Pour éviter un licenciement ou une perte d'emploi suite à une faillite, le gestionnaire est contraint de minimiser les coûts de gestion et de réduire l'expropriation des actionnaires. Si de tels facteurs externes contraignent le gestionnaire à cette tâche, alors peu d'outils internes de gouvernance devraient être implantés. Plusieurs études ont tenté de vérifier si les données empiriques vérifient cette intuition théorique. Deux questions sont généralement abordées : (1) Existe-t-il une relation entre la gouvernance et la compétition? (2) La gouvernance a-t-elle un effet sur le comportement des gestionnaires dans une industrie compétitive? En d'autres termes, la gouvernance améliore-t-elle la valeur de l'entreprise?

En recourant à des données américaines, Giroud et Mueller (2011) montrent que l'impact de la gouvernance d'entreprise sur la valeur des entreprises est plus grand dans les industries faiblement compétitives que dans les industries fortement compétitives. Chhaochharia, Grinstein, Grullon et Michaely (2009) corroborent ces résultats tout en montrant que les outils de gouvernance sont plus nombreux dans les industries moins compétitives que dans les industries compétitives.

Notre étude se démarque de la littérature par l'apport de deux contributions majeures. D'une part, contrairement à la théorie dominante, nous identifions deux effets que peut avoir la compétition sur la gouvernance. En plus de l'effet de discipline, la compétition peut accroitre le besoin en capitaux extérieurs. En effet, la compétition réduit les profits, lesquels représentent les capitaux internes auxquels une entreprise peut recourir pour le financement de ses activités. Lorsque les profits sont réduits, l'entreprise peut obtenir des capitaux extérieurs à moindre coût si elle améliore sa gouvernance. Certaines études dont celle de Shleifer et Vishny (1997) montrent que les investisseurs

prêtent d'avantage aux entreprises dotées d'une bonne gouvernance. Ainsi, la compétition peut réduire les besoins en gouvernance via l'effet de discipline, et les augmenter via l'effet des capitaux extérieurs. Le résultat est donc ambigu.

D'autre part, nous contribuons à la littérature en considérant des données provenant de plusieurs pays. Ces données nous permettent de tenir compte des caractéristiques-pays qui sont des facteurs externes susceptibles d'influencer la gouvernance. Ainsi, Doidge, Karolyi et Stulz (2007) montrent comment les développements économiques et financiers d'un pays peuvent influencer le choix d'une entreprise (i.e, les dirigeants) d'investir dans la gouvernance. En effet, les entreprises dans les pays en voie de développement auraient une moins bonne gouvernance que celles des pays développés. Nous montrons que la prise en compte des caractéristiques-pays peut déterminer quel effet de la compétition affectera le plus la gouvernance. Nous montrons que l'effet des capitaux extérieurs est moins prononcé dans les pays développés dans la mesure où les entreprises ont une meilleure gouvernance. Nous faisons ainsi l'hypothèse que l'effet de discipline aura plus d'impact dans les pays développés, mais que cet effet sera dominé par l'effet des capitaux extérieurs dans les pays en voie de développement.

Nos résultats empiriques confirment nos hypothèses. D'abord nous corroborons les résultats d'études précédentes, mais seulement pour un sous-échantillon de pays développés : la gouvernance d'entreprise est plus forte dans les industries faiblement concurrentielles. Par contre, dans les pays les moins développés, les industries fortement concurrentielles se différencient des industries faiblement concurrentielles, notamment par une meilleure gouvernance d'entreprise. En abordant la deuxième question, nous

confirmons pour les pays développés que les entreprises des industries compétitives bénéficient peu de la gouvernance : la valeur boursière de l'entreprise est faiblement affectée par différents niveaux de gouvernance dans les industries compétitives contrairement aux industries moins compétitives. Pour les pays en développement, toutes les entreprises bénéficient d'une meilleure gouvernance, surtout quand la compétition est forte.

Le deuxième essai, intitulé « Credible Reforms and Stock Return Volatility : Evidence from Privatization », évalue comment la confiance des investisseurs sur l'engagement du gouvernement envers des politiques orientées le marché, affecte la volatilité des rendements des actifs financiers. Nous choisissons comme cadre d'analyse des réformes économiques sous la forme d'une politique de privatisation des entreprises gouvernementales. La privatisation se définit comme le transfert des actifs gouvernementaux au secteur privé. Elle est généralement une réponse à l'incapacité du gouvernement à promouvoir l'efficacité des entreprises. Certaines recherches relient la privatisation à une meilleure performance des entreprises, à une gouvernance d'entreprise plus efficiente, au développement du marché financier local, etc., (voir Megginson and Netter (2001) pour une revue exhaustive de la littérature).

Dans cet essai, nous adoptons une nouvelle approche en tentant d' apprendre un peu plus sur la privatisation via l'étude de son impact sur la volatilité des rendements des actifs financiers dans plusieurs pays. La volatilité des rendements des actifs financiers, de plus en plus étudiée en finance, peut avoir des implications sur le choix de portefeuille

des investisseurs et sur le développement financier ou économique d'un pays. Pour un investisseur, comme le soulignent Campbell, Lettau, Malkiel et Xu (2001), le nombre d'actifs financiers nécessaires pour entièrement diversifier un portefeuille dépend du niveau de volatilité idiosyncratique (i.e. la volatilité spécifique à l'entreprise) de ces actifs financiers. Par conséquent, l'investisseur doit constamment revoir son choix de portefeuille et sa stratégie de couverture en fonction des changements de volatilité idiosyncratiques. Une trop grande volatilité peut freiner le développement d'une économie. En effet, le coût du capital des entreprises est généralement proportionnel à la volatilité de leurs actifs financiers. Ainsi, dans un contexte de volatilité excessive les entreprises auront tendance à retarder leurs décisions d'investir. La généralisation d'un tel contexte peut affecter l'investissement et le développement économique d'un pays. Au regard de ces implications, il est intéressant de savoir si les réformes économiques telles que la privatisation, dont un but est d'améliorer la performance des entreprises, influence la volatilité.

Selon Bekaert et Harvey (2003), la littérature en finance n'offre aucune relation claire entre la volatilité et les réformes économiques. D'une part, à la suite d'une réforme, l'augmentation de la volatilité peut être associée à un marché financier plus efficient dans la mesure où les prix reflètent immédiatement l'information lorsqu'elle est disponible. La volatilité peut aussi augmenter si la réforme occasionne une entrée massive de capitaux spéculatifs. D'autre part, si la volatilité était élevée avant la réforme, elle peut baisser durant la période de l'application de la réforme, notamment avec le développement et la diversification du marché.

Dans cet essai, nous soutenons que le lancement d'une reforme crédible de privatisation résout le risque politique entourant les activités des entreprises et réduit la volatilité. Par risque politique, nous entendons l'ingérence du gouvernement dans les activités des entreprises, l'interruption de la réforme de privatisation, ou la nationalisation d'entreprises déjà privatisées. La privatisation est crédible lorsqu'elle est mise en place de façon graduelle sur une longue période (Perotti, 1995). En effet, un gouvernement peut décider de privatiser ses entreprises pour des objectifs autres que l'efficience économique (par exemple lever des fonds pour résoudre un déficit budgétaire). Un tel gouvernement aura tendance à mettre fin à la réforme de privatisation une fois que cet objectif sera atteint. Dans ce cas, la privatisation n'est pas crédible et les investisseurs seront réticents à participer à d'autres réformes. En résumé, la crédibilité de la privatisation s'établit sur le long terme. À court terme, les investisseurs appréhendent un risque politique associé à l'objectif (inconnu) du gouvernement. Ceci peut se traduire par une grande volatilité sur le marché financier. À long terme, à mesure que la réforme est implantée, la confiance des investisseurs s'établit quant à la crédibilité de la privatisation, d'où une réduction de la perception du risque politique et donc une baisse de la volatilité.

Nous testons cette intuition sur des données empiriques dans 47 pays. Nous montrons que le processus de privatisation (mesuré par la moyenne cumulée du ratio des revenus issus de la privatisation sur le produit intérieur brut) réduit la volatilité via la réduction du risque politique. En particulier, nous montrons empiriquement que le processus de privatisation est associé à moins de risque politique. Ensuite, nous trouvons que la composante du risque politique expliquée par la privatisation est négativement reliée aux volatilités systématique et idiosyncratique.

Ensuite, nous étudions si la relation entre la privatisation et la volatilité varie selon le niveau de développement économique. La littérature suggère que la volatilité des marchés émergents est supérieure à celle des marchés développés (Bekaert et Harvey, 1997) et que le risque politique est de plus grande importance dans les marchés émergents (Perotti et van Oijen, 2001). En effet, nous trouvons que durant le programme de privatisation, la baisse de la volatilité est plus grande dans les pays en voie de développement que dans les pays développés. En outre, dans les pays en voie de développement, cette baisse est principalement due à la composante systématique de la volatilité, c'est à dire le risque non diversifiable, tandis que dans les pays développés, la baisse de la volatilité est due en général à la composante idiosyncratique. Des tests supplémentaires indiquent que l'impact de la politique de privatisation est plus grand lorsque les entreprises sont privatisées sur le marché financier. Enfin, nos résultats montrent que, bien que toutes les entreprises cotées sur le marché boursier bénéficient de la résolution du risque politique, la réduction de la volatilité est plus prononcée pour les entreprises qui sont partiellement détenues par le gouvernement.

Mots-Clés: compétition, gouvernance d'entreprise, développements économiques, protection des investisseurs, privatisation, volatilité, risque politique, analyse multivariée, économétrie.

Summary of the thesis

This thesis includes two essays on two different topics: (1) corporate governance and (2) privatization.

In the first essay titled « Does Competition Matter for Corporate Governance? The Role of Country Characteristics », we investigate the relationship between product market competition and corporate governance. Specifically, do country characteristics influence this relationship, and how does this relationship affect firm value? Using U.S. data, Giroud and Mueller (2011) show that, firms from weakly competitive industries benefit more from good governance than do firms from strongly competitive industries. Using corporate governance ratings for a large sample of firms from thirty-eight countries, we corroborate Giroud and Mueller's (2011) findings for a set of developed countries. Further, we highlight the role that country characteristics, especially the level of economic and financial development and the level of investor protection, play in the relation between competition and corporate governance. We find that competition is associated with lower corporate governance ratings in developed countries. In developing countries, firms from competitive industries have, on average, higher corporate governance ratings than firms from less competitive industries. We next examine the impact of corporate governance on firm value. We show that corporate governance is positively associated with greater firm value, but only in less competitive industries from developed countries. For developing countries, the evidence suggests that corporate governance is valuable mostly in competitive industries.

The second essay, titled « Credible Reforms and Stock Return Volatility: Evidence from Privatization », examines how investors' confidence, about the government commitment towards market-oriented policies impacts stock return volatility.

We focus on privatization, a market-oriented policy. The literature often relates privatization to an improvement in firm performance, better corporate governance; stock market development, etc. (see Megginson and Netter (2001) for a comprehensive survey). In this essay, we propose to learn more about privatization through the study of its impact on stock return volatility. Using a sample of 47 countries, we show that privatization is related to volatility via political risk. Indeed, a privatization program maintained over some time signals the government credibility and this process gradually resolves political risk and reduces volatility. Volatility decomposition shows that the sustainability of the privatization program is mostly associated with lower idiosyncratic volatility among developed markets, while it is strongly related to developing markets' systematic volatility. Additional tests suggest that the reduction in volatility components is greater when a sustained privatization program is carried out through the stock market. Finally, our results indicate that although all public firms benefit from the resolution of political risk, firms that are partly owned by the government experience greater reduction in volatility.

Keywords: competition, corporate governance, economic development, investor protection, privatization, volatility, political risk, multivariate analysis, econometrics.

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CLSA Crédit Lyonnais Security Asia

IPO Initial Public Offerings

ISS Institutional Shareholders Services

SIP Share Issue Privatization

S**&**P Standard and Poors

Dédicace

À mes parents
Germain Mwinpono Somé et Anastasie Dordemis Da

À mes frères et sœurs
Placide, Patricia, Matthieu, Pascaline et Daniel

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Essay 1: Does competition matter for corporate governance? The role of country characteristics[1]

Abstract

We investigate the empirical relation between competition and corporate governance and the effect of country characteristics on this relation. Using corporate governance ratings for a large sample of firms from thirty-eight countries, we highlight the role that country characteristics, especially the level of economic and financial development and the level of investor protection, play in the relation between competition and corporate governance. Specifically, we find that competition is associated with lower corporate governance ratings in developed countries. In developing countries, firms from competitive industries have, on average, higher corporate governance ratings than firms from less competitive industries. We next examine the impact of corporate governance on firm value. We show that for a given level of competition, the impact of corporate governance on firm value varies with country characteristics. Indeed, corporate governance is positively associated with greater firm value, but only in less competitive industries from developed countries. For developing countries, the evidence suggests that corporate governance is valuable mostly in competitive industries.

JEL Classification: G30, L00, O16

Keywords: Product Market Competition, Corporate Governance, Economic and Financial development, Investor Protection, multivariate analysis, econometrics.

[1] Cet article a été co-écrit avec Jean-Claude Cosset et Pascale Valéry.

1. Introduction

The evidence indicates that corporate governance affects firm performance (e.g., Gompers, Ishii, and Metrick, 2003; Cremers and Nair, 2005; Bebchuk, Cohen, and Ferrell, 2009). What factors influence corporate governance is thus an important question in corporate finance. An extensive literature investigates the firm- and country-level determinants of corporate governance (e.g., La Porta, Lopez-De-Silanes, Shleifer, and Vishny, 2000; Klapper and Love, 2004; Durnev and Kim, 2005; Doidge, Karolyi, and Stulz, 2007). This literature documents that firm-level growth opportunities and external financing needs are relevant for corporate governance, as well as the level of investor protection in a country and a country's level of economic and financial development.

While the above firm- and country-level determinants of corporate governance have gained much attention over the last two decades, recent empirical studies consider the role of industry characteristics, particularly the extent of product market competition, in influencing corporate governance. Evidence from the U.S. (Giroud and Mueller, 2011) and other developed countries from the European Union (Ammann, Oesch, and Schmid, 2011) suggests that firms in less competitive industries benefit more from good governance than do firms from competitive industries. These studies show that agency costs such as lower labour productivity, higher administrative expenses, and more value-destroying acquisitions are higher in less competitive industries. In competitive industries, in contrast, competition reduces these agency costs and increases firm efficiency.

Common to most empirical studies on competition and corporate governance is a focus on countries that are economically developed such as the U.S. Yet a country's level of economic and financial development and level of investor protection influence firms' corporate governance (Doidge et al., 2007), and thus could affect the relation between competition and corporate governance. Unlike studies on developed countries, however, research on developing countries has had too little to say about whether competition matters for corporate governance. Indeed, to the best of our knowledge, no prior study has examined whether country factors influence the relation between competition and corporate governance. The objective of this paper is to fill this gap in the literature by investigating the determinants of corporate governance along three dimensions: the company, the industry, and the country.

We investigate the empirical relation between competition (weak, soft, and strong) and S&P corporate governance ratings for a large sample of firms from 38 countries. Partitioning the sample into developed and developing countries and controlling for other country variables such as investor protection and stock market capitalization, we find that firms from softly or weakly competitive industries have higher corporate governance ratings than firms from strongly competitive industries, but only in developed countries. In developing countries, competition is positively associated with corporate governance ratings. Thus, firms from softly and weakly competitive industries have lower governance ratings than firms from strongly competitive industries.

We attribute our findings above to two simultaneous effects of competition on corporate governance. On the one hand, competition reduces firm profits and in turn the internal capital available to finance new investments; in such a context, a firm that seeks

external capital should improve its corporate governance as investors require protection in exchange for their capital (external financing effect). This effect is likely to be less pronounced if the country's capital market is developed (as firms can access external capital at a reasonable cost) or if the country has strong investor protection. In developing countries, however, where the capital market is narrow and external capital is expensive (Doidge et al., 2007), firms need to improve their governance to attract investors, particularly when their survival is threatened by intense competition. On the other hand, competition acts as a disciplinary mechanism by increasing managerial effort (Hart, 1983) and hence investors should not require strong governance to monitor the managers of firms from competitive industries (managerial discipline effect). Our empirical results suggest that the disciplinary effect is dominant in developed countries, while the external financing effect dominates in developing countries. This evidence complements recent empirical studies on competition and governance for the U.S. (see Chhaochharia et al., 2009) by showing that their results extend to a larger sample of developed countries but not to a sample of developing countries.

We next examine the impact of the relation between competition and governance ratings on firm value. For developed countries, we find that firms from softly and weakly competitive industries benefit more from good governance than firms from strongly competitive industries. This evidence is consistent with the results of Giroud and Mueller (2011) for the U.S. and Ammann et al. (2011) for developed countries in the European Union, who also show that corporate governance is more valuable for firms in less competitive industries than for firms in competitive industries. As Giroud and Mueller (2011) suggest, this evidence supports the view that corporate governance and

competition are substitutes. For developing countries, we find that corporate governance significantly increases firm value not only in softly and weakly competitive industries but also (indeed, mostly) in strongly competitive industries, suggesting that competition complements corporate governance.

We contribute to the growing literature on competition and governance in two ways. First, while most studies in this literature focus on a single country (Januszewski, Köke, and Winter, 2001; Giroud and Mueller, 2010, 2011; Chhaochharia et al., 2009; Karuna, 2010) or on a handful of developed countries from the European Union (Ammann et al., 2011), we provide evidence for a wide set of firms from developed and developing countries. Essentially, we highlight the role that country characteristics, especially the level of economic and financial development and the level of investor protection, play in the relation between competition and corporate governance. Overall, country characteristics determine which of two effects of competition on corporate governance (external financing or disciplinary) will prevail in a country. Hence, this paper echoes a recent study on the influence of country characteristics on corporate governance practice (see, Doidge et al., 2007). Second, we contribute to the literature on competition, governance and firm value. Several single-country studies succeeded in showing how the impact of corporate governance on firm value depends on the level of competition. In our paper, we extend this literature by introducing a new dimension. Specifically, we show that for a given level of competition, the impact of corporate governance on firm value varies with country characteristics. To the best of our knowledge, our study is the first to investigate the impact of country characteristics on the relation between competition and corporate governance on firm value.

The paper proceeds as follows. In Section 2, we provide a brief review of the literature on competition, managerial incentives, and governance, and we develop our hypotheses. In Section 3, we describe our sample construction and empirical measures. In Section 4, we investigate both the relation between competition and governance and the influence of country characteristics on this relation. We also conduct robustness tests. In Section 5, we examine the impact of this relation on firm value. Section 6 concludes.

2. Literature review and hypotheses

Recently, financial economists have empirically examined the relation between competition and corporate governance.[2] Using U.S. data, Giroud and Mueller (2011) show that agency costs (lower labour productivity, higher input costs, and value-destroying acquisitions) are higher in less competitive industries but that good governance helps reduce these costs, increasing firm value in these industries. Chhaochharia et al. (2009) further document that the Sarbanes-Oxley Act of 2002, which aimed to enhance internal corporate governance, led to an increase in firm efficiency, but mostly in less competitive industries, suggesting that corporate governance indeed matters more in these industries.[3]

While prior work has established that increased competition reduces agency costs, the impact of competition on the quality of corporate governance remains a puzzle. If

[2] Readers are referred to Giroud and Mueller (2011) for a review of the theoretical literature on the implications of product market competition for managerial slack and the need to give managers monetary incentives.

[3] Karuna (2010) finds a more complex relation: corporate governance ratings increase and then decrease as competition (measured using 4-digit SIC codes) increases, suggesting a non-linear relation. We address the issue of nonlinearity between competition and corporate governance in our empirical tests.

competition reduces agency costs, the need to provide managers with incentives through good governance should be lower. Giroud and Mueller (2011) show that the distributions of corporate governance ratings are similar across competitive and less competitive industries. But Chhaochharia et al. (2009) find that firms in less competitive industries have better corporate governance ratings. This suggests that further research is required to establish the empirical relation between competition and corporate governance.

In this study, we argue that country characteristics can influence the relation between competition and corporate governance. This argument is motivated by the view that countries matter for firms' decision to invest in corporate governance. Doidge et al. (2007, page 3), for example, argue that

> "countries matter because they influence the costs that firms incur to bond themselves to good governance and the benefits from doing so…. However, mechanisms to do so could be unavailable or prohibitively expensive in countries with poor state investor protection or poor economic and financial development…. Perhaps, the most important benefit of good governance is access to capital markets on better terms. But this benefit is worth less to a firm in a country with poor financial development because that firm will obtain less funding from the capital markets and hence will benefit less from any governance-related reduction in the cost of funds. Consequently, firms in countries with low financial and economic development will find it optimal to invest less in governance and the rights of minority shareholders will be mostly determined at the country level rather than at the firm level."

Doidge et al. (2007) show that country characteristics explain more of the cross-sectional variation in governance ratings than observable firm characteristics. In addition, they find that while firm characteristics are relevant in developed countries, they do not explain corporate governance ratings in developing countries. Our paper extends Doidge et al. (2007) by investigating whether product market competition, an industry characteristic, is a relevant determinant of firm-level governance.

Following Alchian (1950), Stigler (1958), and Machlup (1967), we expect that competition reduces firm profits and induces more effort from managers to minimize costs. The reduction in profits has two effects on corporate governance. On the one hand, it reduces the amount of internal financing available to invest in new projects, and hence increases the need for external financing. But the main reason outside investors provide external financing to firms is to receive control rights in exchange (Shleifer and Vishny, 1997), which increases the need for good governance. On the other hand, the reduction in profits increases managers' effort to maximize firm value (or minimize costs), which decreases the need for good governance.

The first argument above is that competition affects corporate governance through external financing needs. Consistent with Doidge et al. (2007), who argue that the benefit of good governance is access to stock markets on better terms, a firm with good governance should be able to access external financing at lower cost and thus not need stronger governance. Consequently, in countries with good governance (mostly developed countries), firms should have lower need for stronger governance when they face more intense competition. In contrast, in countries with weak governance (mostly

developing countries), firms should have greater need for stronger governance when competition is strong than when competition is weak.[4] This leads to our first hypothesis:

Hypothesis I: The impact of competition on corporate governance is strong (weak) in developing (developed) countries, ceteris paribus.

The second argument discussed above is that competition increases managerial effort and thus acts as a disciplinary mechanism encouraging value-maximization. Therefore, the governance of firms from competitive industries will not need to be strong (Giroud and Mueller, 2011), while the governance of firms in less competitive industries, where the lack of competition fails to discipline managers, should be stronger. This argument runs counter to the argument of the external financing effect, which holds that competition may induce good governance through external financing needs. Depending on which effect (external financing or managerial discipline) dominates, firms from competitive industries may have stronger or weaker governance. For developed countries, we expect the external financing effect to be lower than the managerial discipline effect since, on average, firms have good governance and external financing is available at lower cost. Our second hypothesis is thus as follows:

[4] This argument does not necessarily mean that firms in developing countries will have better governance than those in developed countries. Rather, it suggests that if firms are in need of external finance, improvements in corporate governance will be more pronounced for firms in developing countries than for firms in developed countries. The initial level of corporate governance is determined by country attributes, which on average induce stronger corporate governance in developed countries than in developing countries (Doidge et al., 2007).

Hypothesis II: In developed countries, firms from less competitive industries have stronger governance than firms from competitive industries (managerial discipline effect dominates), ceteris paribus.

For developing countries, the reduction in profits due to competition and the increased need for external financing that results induce the firm to implement good governance. However, the managerial discipline effect reduces the need for good governance. Therefore, a priori it is not clear whether firms from competitive industries will have weaker or stronger governance than firms from less competitive industries. We argue that in developing countries (where corporate governance is weak and the capital market is narrow) the external financing effect dominates the managerial discipline effect as firms will compete to access scarce capital. Indeed, the greatest benefit of good corporate governance is access to external capital at lower cost. Therefore, firms in competitive industries that need to raise external capital should improve their corporate governance. In contrast, when competition is weak (lack of disciplinary effect), corporate governance should improve; but firms will not have incentives to improve their governance because they face less pressure to raise external capital since they generate profits/internal financing and strong governance mechanisms are costly to implement in developing countries (Doidge et. al., 2007). As a result, firms in less competitive industries will have weaker corporate governance. This discussion leads to our third hypothesis:

Hypothesis III: In developing countries, firms from competitive industries have stronger governance than firms from less competitive industries (external financing effect dominates), ceteris paribus.

If competition induces better governance in developing countries, as stated in Hypothesis III, then firms from competitive industries should benefit from an increase in competition-related governance. Indeed, if good corporate governance is associated with greater firm value (Gompers et al., 2003), and if competition induces stronger governance, then firms in competitive industries domiciled in developing countries should benefit from good governance. In developed countries, however, competition has a limited impact on governance (Hypothesis II); therefore governance will be most valuable for weakly competitive firms that have stronger governance. Our fourth hypothesis is thus as follows:

Hypothesis IV: In developing countries corporate governance increases firm value primarily in competitive industries (higher external financing effect), while in developed countries corporate governance increases firm value primarily in less competitive industries (lower managerial discipline effect), ceteris paribus.

Hypothesis IV suggests that in developing countries competition and corporate governance are complements in explaining firm performance, while in developed countries they are substitutes. In the following sections, we investigate whether any of the four hypotheses above find empirical support.

3. Data and variables

Our data collection begins with firms included in the S&P Transparency and Disclosure ratings. We collect firm-level data from Worldscope. Industry concentration

measures come from Bureau van Dijk ORBIS, and country variables come from the World Development Indicators database. Variables are described in Table I.

3.1 Corporate governance sample

To investigate the relation between competition and corporate governance, we use the S&P Transparency and Disclosure ratings. These ratings were issued in 2001 for 1,443 firms from around the world. The ratings were compiled through examination of year 2000 annual reports and SEC filings. A firm receives a value of one each time it meets one of ninety-eight disclosure requirements and zero otherwise. The requirements are divided into three categories: twenty-eight requirements on ownership structure and investor rights, thirty-five requirements on board structure and process, and thirty-five requirements on financial transparency and information disclosure. The summed scores are then converted into a percentage, with a higher percentage indicating better disclosure. These ratings have recently been used in the financial economics literature. For example, Khanna, Palepu, and Srinivasan (2004) evaluate whether foreign companies' interaction with U.S. product, labor, and financial markets are related to their disclosure and governance practices. Durnev and Kim (2005) investigate how firm characteristics and country legal environment affect disclosure practices. Doidge et al. (2007) examine the effect of country characteristics on corporate governance.

We exclude U.S. firms because the S&P Transparency and Disclosure ratings "use US disclosure standards as an implicit benchmark; therefore, they measure the degree of similarity of a company's disclosure practices to US practices" (Khanna et al., 2004, page 503). Throughout the paper, we refer to the S&P Transparency and Disclosure

ratings as *corporate governance ratings* or simply *ratings* for the sake of simplicity. After excluding financial firms, our final sample comprises 682 firms from 38 developed and developing countries. Table II reports descriptive statistics for the S&P corporate

Table 1-I: Variable Definitions and Sources

Variables		Definition
Panel A: Corporate Governance Variables		
Corporate governance ratings	S&P	S&P Transparency and Disclosure ratings issued in 2001 for year 2000 based on an examination of 98 disclosure requirements. A firm receives a value of one each time it meets one of these requirements and zero otherwise. The results from this examination are then converted into a percentage for each firm.
	CLSA	Credit Lyonnais Security Asia (CLSA) governance ratings issued in 2001 for year 2000 for firms in emerging markets. The ratings are based on responses by financial analysts to 57 corporate governance questions. The responses are converted into a percentage for each firm.
	ISS	Institutional Shareholder Services (ISS) corporate governance quotients issued since 2003 for non-U.S. firms mostly in developed countries. The quotients are based on 55 governance attributes. For each attribute, a firm is given one or zero depending on whether it meets a threshold for the implementation of the attribute. We retain only 44 attributes that are common to both U.S. and non-U.S. coverage (Aggarwal et al., 2009). The results are converted into a percentage for each firm.
Pane B: Industry-level Variables (two-digit SIC codes)		
Herfindahl-Hirschman Index	HHI	Sum of squared firms' market shares based on sales, computed at the industry level. Firm sales are from Bureau van Dijk Orbis.
	Competition	Expressed as one minus HHI.
	Strongly competitive	Dummy variable set to one if competition lies in the highest tercile of the competition distribution, and zero otherwise.
	Softly competitive	Dummy variable set to one if competition lies in the middle tercile of the competition distribution, and zero otherwise.
	Weakly competitive	Dummy variable set to one if competition lies in the lowest tercile of the competition distribution, and zero otherwise.
Four firms' concentration ratio	CONC	Sum of the four largest firms' market shares, constructed using firms sales from Bureau van Dijk Orbis.
External financing	Dependence on external finance	Industry median of the five-year sum of capital expenditures minus the five-year sum of funds from operations divided by the five-year sum of capital expenditures, computed for U.S. firms included in COMPUSTAT from 1995 to 2000; non-U.S. firms and U.S. firms are matched by two-digit SIC codes.
Panel C: Country-level Variables		
Gross national product per capita	Log GNP/capita	Logarithm of annual gross national product per capita (World Bank Development Indicators, WDI).
Investor protection	Country investor protection	Product of anti-director rights index (Djankov et al., 2008) and the rule of law index from International Country Risk Guide (ICRG).
Stock market capitalization	Stock market capitalization/ GDP	Stock market capitalization scaled by gross domestic product (Beck and Demirgüç-kunt, 2009), available from the World Bank.

Panel D: Firm-level Variables		
Lerner Index	Price-cost margin	Net income before extraordinary items (Worldscope 01551) to net sales (Worldscope 01001); we delete values below and above zero and one, respectively.
Growth opportunities	Sales growth	Two-year geometric average of annual inflation-adjusted growth in net sales (Worldscope 01001), trimmed at the 1% level.
Total assets	Log(Assets)	Logarithm of total assets (Worldscope 02999).
Ownership	Ownership	Proportion of shares held by insiders (Worldscope 08021).
Cash holdings	Cash/Assets	Cash and short-term investments (Worldscope 02001) divided by total assets (Worldscope 02999).
International competition	Foreign sales/ Total sales	Foreign sales (Worldscope 07101) scaled by net sales (Worldscope 01001).
Research and development	R&D/Total sales	Research and development (Worldscope 01201) normalized by net sales (Worldscope 01001); we replace with zero when missing.
American Depositary Receipt dummy	ADR	U.S. cross-listing dummy, which equals one if the firm is cross-listed on a major U.S. exchange (level 2 or 3 ADR); source: Bank of New York, Citibank, NYSE, NASDAQ, and JP Morgan.
Excess returns	Alpha	A stock excess returns proxy (alpha, Worldscope item 09803) and a stock market risk proxy (beta, Worldscope item 09802) computed over 23 to 35 consecutive month-end percentage price changes relative to a local market index.
Market risk	Beta	
Capital expenditures	Capital expenditures/Assets	Capital expenditures (Worldscope 04601) divided by total assets (Worldscope 02999).
Leverage	Debt/Assets	Total debt (Worldscope 03255) over total assets (Worldscope 02999).
Property, plant, and equipment	Property/Assets	Property, plant, and equipment (Worldscope 02501) scaled by total assets (Worldscope 02999).
Firm valuation	Tobin's Q	Total assets (Worldscope 02999) plus market value of equity (Worldscope 08001) minus book value of equity (Woldscope 03501) over total assets (Worldscope 02999), trimmed at the 1% level.

governance ratings. Firms with the highest average ratings are from Finland (75.69), Ireland (75.25), and the United Kingdom (71.22) while firms with the lowest average ratings are from Colombia (19.15), Taiwan (21.63), and Peru (23.26). The sample standard deviation is 16.54, with minimum and maximum ratings of 5.21 and 88.78, respectively. Taken together, these statistics indicate that there are important cross-country variations in corporate governance ratings.

3.2 Product market competition

To examine whether industry characteristics explain corporate governance ratings, we collect data on sales from Bureau van Dijk ORBIS, which covers public and private companies worldwide. Our main measure of competition relies on the Herfindahl-Hirschman index (HHI), a measure of industry concentration that is defined as the sum of squared firms' market shares in industry *i* and year *t*,

$$HHI_{it} = \sum_{j=1}^{N_i} s_{jit}^2, \quad (1)$$

where N_i is the number of firms (*j*) in the industry *i*. HHIs are computed at the two-digit SIC code level. We exclude observations with negative or missing values on sales. Recent multinational studies consider firm clustering at the two-digit SIC code level (see, e.g., Guadalupe and Pérez-González, 2010; Ammann et al., 2011). In robustness checks, we consider HHI clustering at the three-, and four-digit SIC code level. To obtain our measure of competition, we subtract HHI from one (i.e., 1-HHI) so that high values indicate strong competition. To evaluate the effect of competition on corporate governance for various competition levels, we follow Giroud and Mueller (2010, 2011)

Table 1-II: Summary Statistics for S&P Corporate Governance Ratings and the Herfindahl-Hirschman Index

This table reports summary statistics for the S&P corporate governance ratings and the Herfindahl- Hirschman Index, HHI, our primary competition measure. N, SD, Min, and Max are the number of sample firms, the standard deviation, the minimum, and the maximum, respectively. The data are for year 2000.

Country	N	Corporate Governance Ratings				Herfindahl-Hirschman Index (HHI)			
		Mean	SD	Min	Max	Mean	SD	Min	Max
Argentina	5	28.19	5.83	23.40	37.23	0.22	0.07	0.10	0.25
Australia	20	61.14	7.25	44.90	71.28	0.38	0.25	0.08	0.99
Austria	1	43.01	.	43.01	43.01	0.42	.	0.42	0.42
Belgium	3	51.42	14.36	37.23	65.96	0.12	0.08	0.06	0.21
Brazil	25	33.78	11.92	21.28	59.18	0.15	0.12	0.09	0.56
Chile	16	31.09	10.96	15.22	54.26	0.39	0.17	0.17	0.66
China	16	48.58	11.31	28.72	63.44	0.11	0.15	0.00	0.43
Colombia	1	19.15	.	19.15	19.15	0.41	.	0.41	0.41
Danemark	5	52.16	17.37	24.47	67.35	0.42	0.22	0.25	0.78
Finland	4	75.69	5.87	70.65	84.04	0.33	0.22	0.18	0.66
France	39	67.91	8.87	47.87	85.11	0.14	0.11	0.02	0.58
Germany	24	55.90	9.66	38.78	73.12	0.24	0.19	0.02	0.63
Greece	1	68.04	.	68.04	68.04	0.32	.	0.32	0.32
Hong Kong	8	47.64	3.26	43.62	52.13	0.57	0.31	0.33	0.99
India	36	38.65	10.36	20.21	62.37	0.13	0.11	0.02	0.60
Indonesia	9	36.68	6.10	26.60	48.94	0.48	0.17	0.22	0.83
Ireland	3	75.25	3.25	71.88	78.35	0.65	0.10	0.57	0.76
Italy	14	58.58	10.41	42.55	73.47	0.18	0.13	0.02	0.35
Japan	125	54.15	3.36	48.39	67.39	0.07	0.07	0.01	0.30
Luxemburg	1	38.30	.	38.30	38.30	0.93	.	0.93	0.93
Malaysia	36	45.34	7.16	35.11	62.77	0.21	0.17	0.04	0.63
Mexico	15	24.36	9.03	15.22	51.61	0.26	0.14	0.10	0.67
Netherlands	21	62.80	10.20	43.88	80.00	0.22	0.16	0.07	0.53
New Zealand	1	55.91	.	55.91	55.91	0.92	.	0.92	0.92
Norway	3	58.83	15.06	45.16	78.72	0.49	0.28	0.27	0.80
Pakistan	8	39.76	6.55	32.98	48.94	0.42	0.26	0.24	0.94
Peru	6	23.26	4.28	18.68	30.85	0.28	0.06	0.21	0.35
Phillipines	3	29.85	11.94	12.24	37.76	0.48	0.27	0.27	0.79
Portugal	5	55.00	9.83	41.49	64.95	0.22	0.18	0.04	0.51
Singapore	6	59.80	5.86	50.00	65.31	0.32	0.25	0.12	0.65
South Korea	32	46.92	12.98	5.21	62.89	0.12	0.09	0.01	0.33
Spain	13	52.67	12.12	32.98	72.34	0.10	0.10	0.00	0.38
Sweden	13	61.52	8.98	45.74	75.51	0.18	0.10	0.04	0.32
Switzerland	11	53.84	12.45	38.04	71.28	0.42	0.28	0.18	0.83
Taiwan	34	21.63	7.15	14.89	38.14	0.09	0.07	0.02	0.27
Thailand	15	51.63	9.45	27.17	65.98	0.34	0.30	0.08	0.99
United Kingdom	102	71.22	6.37	56.52	88.78	0.25	0.19	0.10	0.88
Venezuela	2	30.65	17.49	18.28	43.01	0.89	0.14	0.79	0.99
Full sample	682	51.81	16.54	5.21	88.78	0.20	0.20	0.00	0.99

and divide our sample by competition terciles. We define strongly, softly, and weakly competitive industries as industries with (1-HHI) in the highest, middle, and lowest terciles of the empirical (1-HHI) distribution.[5]

[5] Generally, markets with HHI below 0.1 are considered more competitive, while markets with HHI above 0.18 are less competitive (Bergh and Camesasca, 2001). The HHI tercile cut-offs in our sample are 0.08

3.3 Country characteristics

We measure economic development using the logarithm of gross national product per capita from the World Development Indicators database. As a measure of stock market development, we use a country's stock market capitalization scaled by its gross domestic product. This variable comes from Beck and Demirgüç-Kunt (2009) and is available on the World Bank website.

To capture a country's investor protection, we multiply shareholder rights by law and order (Durnev and Kim, 2005; Doidge et al., 2007). Our shareholder rights measure is the revised anti-director rights index from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2008) and our law and order measure comes from International Country Risk Guide (ICRG). Following Doidge et al. (2007), we split our sample into developed and developing countries, with developed (developing) countries comprising those countries that have gross national product per capita above (below) the sample median.[6]

Panel A of Table III presents the distribution of corporate governance ratings across levels of economic development. On average, developed countries have a corporate governance rating of 60.17, while developing countries have a corporate governance rating of 40.21. Among developing countries, corporate governance ratings

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and 0.21, which are below and above 0.1 and 0.18, respectively. Thus, we believe that our competition levels are conservative.

[6] We also divide the sample into developed and developing countries following the World Bank income classification (World Bank, 2000). High income countries are deemed developed while middle and low income countries are considered developing. With this classification three countries, Greece (one firm in the sample), Portugal (five firms) and New Zealand (one firm) are developed while they are included in the developing countries sample using the median classification. We run all our regressions using the World Bank classification and find similar results that we do not report. They are available from the authors upon request.

Table 1-III: Distribution of S&P Corporate Governance Ratings and the Herfindahl-Hirschman Index

This table reports the distributions of the S&P corporate governance ratings and our primary measure of competition, which is expressed as 1-HHI, where HHI is the Herfindahl-Hirschman Index computed as the sum of squares of firms' industry market shares based on sales; firm sales come from Bureau van Dijk ORBIS. We identify an industry by its two-digit SIC code. Strongly, softly, and weakly competitive are subsamples of firms in industries with competition in the highest, middle, and lowest terciles of the empirical competition distribution. N, Mean, Min, and Max are the number of firms, the mean, the minimum, and the maximum of the variable, respectively. Mean Difference is the mean difference in S&P corporate governance ratings or competition between developing and developed countries. Developed (developing) countries comprise countries with GNP/capita above (below) the sample median, where GNP/capita is gross national product per capita and is from WDI. *, **, and *** reflect significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Corporate governance ratings (by competition terciles)

		Strongly competitive	Softly competitive	Weakly competitive	Full sample
Developed	N	129	156	131	416
	Mean	56.35	62.82	60.77	60.17
	[Min Max]	[32.97 78.72]	[37.23 85.10]	[24.46 88.78]	[24.46 88.78]
Developing	N	64	84	118	266
	Mean	45.51	40.73	36.96	40.21
	[Min Max]	[13.82 61.29]	[5.21 65.97]	[12.24 68.04]	[5.21 68.04]
	Mean Difference	10.84***	22.08***	23.81***	19.96***

Panel B: Competition (1-HHI)

		Strongly competitive	Softly competitive	Weakly competitive	Full sample
Developed	N	129	156	131	416
	Mean	0.96	0.87	0.58	0.81
	[Min Max]	[0.92 0.99]	[0.79 0.92]	[0.01 0.79]	[0.01 0.99]
Developing	N	64	84	118	266
	Mean	0.96	0.88	0.67	0.80
	[Min Max]	[0.92 0.99]	[0.79 0.92]	[0.01 0.79]	[0.01 0.99]
	Mean Difference	0.00	-0.01**	-0.09***	0.01

decline, on average, from 45.51 in strongly competitive industries to 36.96 in weakly competitive industries. We observe a different pattern among developed countries, with corporate governance ratings increasing, on average, from 56.35 in strongly competitive industries to 62.82 in softly competitive industries before decreasing slightly to 60.77 in weakly competitive industries. Results of mean difference tests suggest that firms from developed countries have, on average, higher corporate governance ratings than firms from developing countries, and that this difference does not change across levels of competition. This evidence supports Doidge et al.'s (2007) finding that firms in developing countries invest less in corporate governance than firms in developed

countries. Panel B of Table III shows that this evidence does not stem from a higher level of competition and in turn, a stronger disciplinary effect since the means of our competition measure across levels of economic development do not differ significantly. The mean difference in competition between developed (0.81) and developing (0.80) countries is not statistically significant, which indicates that, on average, industries are not less competitive in developed than in developing countries. This suggests that country characteristics account for the cross-sectional variation in the distribution of corporate governance ratings across competition levels, as shown in Panel A of Table III.

3.4 Firm and industry characteristics

We control for firm-specific determinants of corporate governance such as sales growth, ownership concentration, firm size, cash holdings, and foreign sales (Durnev and Kim, 2005; Doidge et al., 2007). We obtain firm-level data from Worldscope /Datastream and for 2000, the year of the corporate governance ratings.

Sales growth is measured as the two-year geometric average of annual inflation-adjusted growth in net sales. We winsorize sales growth at the 1^{st} and 99^{th} percentiles to reduce the impact of outliers. We expect this variable to positively affect corporate governance ratings (Durnev and Kim, 2005; Doidge et al., 2007).

Note that sales growth, a proxy for firm growth opportunities, may be affected by a country's institutions and business conditions. We therefore use the dependence on external finance as an alternative measure of growth opportunities, as it is computed from U.S. data and thus unrelated to country business conditions (Doidge et al., 2007). More

specifically, using data for U.S. firms from Compustat, we first compute firm-level dependence on external finance as the five-year sum of capital expenditures minus the five-year sum of cash flows divided by the five-year sum of capital expenditures. We then construct the dependence on external finance as the median across all firms in the same industry (defined at the two-digit SIC code level). Next, we match U.S. and foreign firms at the industry level. Finally, we assign the industry median (from U.S. industries) to each of our sample firms with the same two-digit SIC code. The dependence on external finance should be positively related to corporate governance ratings.

The ownership concentration variable is the number of closely held shares divided by common shares outstanding. In Worldscope, closely held shares comprise (1) shares held by insiders, including senior corporate officers, directors, and their immediate families, (2) shares held in trusts, (3) shares held by another corporation (except shares held in a fiduciary capacity by financial institutions), (4) shares held by pension/benefit plans, and (5) shares held by individuals who hold 5% or more of shares outstanding. Controlling shareholders divert less of the firm's cash flows when their ownership in the firm is high (Doidge et al., 2007; Lombardo and Pagano, 2002; Shleifer and Wolfenzon, 2002). Therefore, ownership concentration is likely to be negatively related to governance ratings. Doidge et al. (2007) use closely held shares to proxy for ownership concentration and find that it is significantly negatively related to the S&P corporate governance ratings in developed countries but unrelated to the S&P corporate governance ratings in developing countries.

We measure firm size using the logarithm of total assets. We scale cash holdings by total assets to control for firm size because larger firms are likely to have larger cash

holdings. Generally, the literature expects the relations between corporate governance ratings and firm size and cash holdings to be positive because large firms and firms with a large amount of cash can more easily meet the costs of implementing corporate governance. However, firms that have just raised external capital to finance growth opportunities would have higher cash holdings, in which case cash holdings should be positively related to governance ratings, while firms with greater cash holdings are less likely to raise external finance, in which case cash holdings could be negatively related to governance ratings (Doidge et al., 2007). We measure international competition as foreign sales/total sales. We expect foreign sales/total sales to be positively related to corporate governance because more global companies may feel more compelled to adopt global governance standards (Durnev and Kim, 2005; Khanna, Kogan, and Palepu, 2006).

We also include a dummy variable (ADR) to control for cross-listing because ADR firms are likely to have higher corporate governance ratings. ADR takes the value of one if the firm is listed on a major U.S. exchange (that is, ADR levels II and III) and zero otherwise. The ADR variable excludes firms listed through Rule 144A and over-the-counter listings since these listed ADR programs are exempt from U.S. reporting requirements (unlike ADR levels II and III). Information on cross-listing comes from the Bank of New York, Citibank, NYSE, NASDAQ, and JP Morgan.

4. Empirical relation between product-market competition and corporate governance

In this section, we report regression results on the relation between competition and corporate governance and we examine how country characteristics affect this relation. We then report results on the nonlinearity of this relation. Finally, we present results for a series of robustness tests.

4.1 Does competition matter for corporate governance?

We consider the following econometric specification:

$$CG_j = \beta'\left(dev \times competition_j\right) + \theta' F_j + \delta' C_k + \varepsilon_j, \quad (2)$$

where CG_j is the S&P corporate governance rating for firm j, $competition$ is calculated as one minus HHI, where HHI is the Herfindahl-Hirschman Index for firm j's industry and measures industry concentration, dev is a (2×1) vector of development dummies whose first and second rows pertain to developed and developing countries, respectively, F_j is a vector of firm-level variables (sales growth, dependence on external finance, the logarithm of assets, ownership concentration, cash holdings to assets, the ratio of foreign sales to total sales), and C_k is a vector of country-level variables (stock market capitalization, investor protection, developed countries dummy).[7] The developed countries dummy is included to control for any direct effect of economic development. If firms in developed countries have stronger incentives to practice good governance as

[7] For an example of such an econometric specification, see Giroud and Mueller (2011), who evaluate the impact of corporate governance on firm value in competitive and less competitive industries.

discussed in Section 2, then the developed countries dummy should have a positive coefficient.

The results in column (1) of Table IV show that the impact of competition on corporate governance ratings is statistically significant at the 1% level in developing countries. The results are also economically significant. Each standard deviation increase in competition raises corporate governance ratings by 1.89, a 3.63% increase over a sample mean of 51.81. These results suggest that competition has a different impact on governance ratings depending on whether the country is developed or developing. In Section 2, we identify two possible effects of competition on corporate governance: while competition increases the need for stronger governance through the demand for *external financing*, it reduces the need for stronger governance through *managerial discipline*. The evidence in Table IV suggests that the first effect dominates in developing countries, while no effect seems to prevail in developed countries. These findings support Hypothesis I, which posits that the impact of competition on corporate governance is strong in developing countries, while in developed countries its impact is weak. As our list of country-level variables is unlikely to be exhaustive, in column (2) of Table IV we report results of country fixed effects regressions. We find that the impact of competition on corporate governance ratings continues to be strong in developing countries and weak in developed countries.

The results reported in columns (1) and (2) of Table IV further suggest that firms in developed countries have higher corporate governance ratings than those in developing countries. This finding is consistent with the view that developed countries invest more in corporate governance than developing countries (Doidge et al., 2007; Aggarwal, Erel,

Stulz, and Williamson, 2009). Indeed, we find that the ratings of firms in developed countries exceed those of firms in developing countries by 10.85. This result continues to hold in country fixed effects regressions. All the control variables display the expected signs. In particular, corporate governance ratings increase with the log of assets, foreign sales/total sales, country-level investor protection, and country-level stock market capitalization, but decrease with ownership concentration.

Overall, the above results support our hypothesis that competition matters for corporate governance, particularly in developing countries (Hypothesis I). One explanation for the insignificant effect of competition on corporate governance in developed countries is that the raw competition measure captures two opposing effects – the *external financing effect* and the *managerial discipline effect* – which are not expected to work equally in competitive and less competitive industries. Indeed, the descriptive statistics shown in Panel A of Table III suggest that the relation between competition and corporate governance might be non-linear. We investigate this possible explanation in the following section.

Table 1-IV: Product-market Competition and Corporate Governance

The dependent variable in each regression is the S&P corporate governance ratings. Competition is expressed as 1-HHI, where HHI is the Herfindahl-Hirschman Index computed as the sum of squares of firms' industry market shares based on sales; firm sales come from Bureau van Dijk ORBIS. We identify an industry by its two-digit SIC code. Firm-level variables are from Worldscope. Sales growth is inflation-adjusted sales growth winsorized at the 1% level; Dependence on external finance is from Compustat and is computed for U.S. firms in the same industry from 1995-2000 as capital expenditures minus cash flows from operations divided by capital expenditures; Log(Assets) is the log of total assets in U.S. dollars; Ownership is the proportion of shares held by insiders; Cash/Assets is cash holdings scaled by total assets; Foreign sales/Total sales is firm exports divided by net sales; ADR is a dummy variable set to one if the firm has a major U.S. exchange listing and zero otherwise; Country investor protection is the product of the anti-director rights index from Djankov et al. (2008) and the rule of law from ICRG; Stock market capitalization/GDP is a country's stock market capitalization divided by gross domestic product and is from Beck and Demirgüç-Kunt (2009); and Developed (Developing) countries comprise countries with GNP/capita above (below) the sample median, where GNP/capita is gross national product per capita and is from WDI. Standard errors are robust to within-country variation; numbers in parentheses are student-t. *, **, and *** reflect significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)
Competition ×Developed countries	3.78	0.96
	(1.33)	(0.39)
Competition ×Developing countries	9.41	6.89
	(2.78)***	(3.17)***
Developed countries	10.85	8.55
	(2.95)***	(5.79)***
Sales growth	1.30	0.86
	(1.20)	(0.89)
Dependence on external finance	0.64	0.53
	(1.43)	(1.11)
Log(Assets)	1.50	1.74
	(3.54)***	(3.87)***
Ownership	-6.08	0.05
	(-2.56)**	(0.02)
Cash/Assets	2.31	5.57
	(0.50)	(1.37)
Foreign sales/Total sales	4.60	2.28
	(2.49)**	(1.18)
ADR	3.75	4.09
	(3.70)***	(3.30)***
Country investor protection	0.44	
	(4.13)***	
Stock market capitalization/GDP	3.40	
	(3.96)***	
Constant	4.77	0.99
	(0.65)	(0.14)
Country fixed effects	no	yes
Adjusted R^2	0.527	0.739
Observations	499	499

4.2 Is the relation between competition and corporate governance non-linear?

In this section, we investigate whether the relation between competition and corporate governance varies with the degree of competition. We address this nonlinearity by dividing the sample into competition terciles (strongly, softly, and weakly competitive). We then estimate the following regression equation:

$$CG_j = \beta_1 softly\ competitive + \beta_2 weakly\ competitive + \gamma' F_j + \delta' C_k + \varepsilon_j, \qquad (3)$$

where CG_j, F_j, and C_k are the same as in equation (2); $softly\ competitive$ and $weakly\ competitive$ are dummy variables that take the value of one if the firm's industry is softly or weakly competitive, and 0 otherwise. All variables are defined in Table I.

Hypothesis II posits that for developed countries, firms in less competitive industries will have higher corporate governance ratings than firms in competitive industries; Hypothesis III on developing countries states the opposite. Hence, we expect the competition dummy coefficients to be positive (negative) for developed (developing) countries.

Columns (1) and (2) of Table V report the results for developed countries. On average, firms from softly competitive industries have 3.68 higher corporate governance ratings than firms from strongly competitive industries; however, the regression coefficient on the dummy for weakly competitive industries is not significant (see column (1)). When we include country fixed effects (column (2)), the coefficient on the softly competitive dummy remains significant and the coefficient on the weakly competitive dummy becomes marginally significant. This finding suggests that the link between competition and corporate governance varies with the level of industry competition.

Columns (3) and (4) of Table V report the estimates of equation (3) for developing countries. The competition dummy coefficients are all negative. On average, firms from softly and weakly competitive industries have respectively 14.63 and 10.56 lower corporate governance ratings than firms from strongly competitive industries

(column (3)). The coefficients on the competition dummies increase from softly to weakly competitive industries, indicating that corporate governance ratings decrease from strongly to softly competitive industries and then increase slightly to weakly competitive industries. In column (4), the inclusion of country fixed effects strongly reduces the *t*-statistics and coefficients on the competition dummies, but the coefficient on softly competitive dummy remains (marginally) significant. This result suggests that a nonlinear relation between competition and corporate governance also holds for developing countries. Furthermore, we note that the adjusted R^2 is now four times greater than that in the specification without country fixed effects in column (3), suggesting that unobservable country characteristics are important in developing countries.

In summary, the evidence from Table V supports Hypothesis III, which posits that in developing countries firms from competitive industries have better corporate governance than firms from less competitive industries. The evidence also supports Hypothesis II, which posits that in developed countries firms from competitive industries have weaker governance ratings than firms from less competitive industries.

The results from Table V are consistent with prior corporate governance studies that find different evidence for developed and developing countries. Doidge et al. (2007) show that firm characteristics are not useful in explaining corporate governance ratings for developing countries, but are relevant for developed countries. We report that corporate governance ratings are negatively related to ownership and positively related to firm size, cash holdings, foreign sales, and the need for external finance, but only for developed countries. For developing countries, none of the firm variables significantly explains corporate governance ratings.

While firm-level variables appear to be irrelevant for corporate governance ratings in developing countries, country-level variables explain corporate governance ratings in both developed and developing countries. The results suggest that incentives to invest in firm-level governance are greater with better country investor protection whatever the level of economic development. Stock market capitalization/GDP is positively associated with corporate governance ratings, but only in developing countries. These results support the view that the benefit of a governance-related reduction in the cost of capital increases with financial development and investor protection (Doidge et al., 2007). For developed countries, GNP per capita has a negative and significant coefficient. As noted by Doidge et al. (2007), this evidence is puzzling since we would expect incentives to invest in firm-level governance to increase with economic development (see the developed countries dummy in Table IV). However, in corporate governance systems that focus more on large shareholders (e.g., business groups[8]) and less on investors' rights, firms finance internally and the rights of minority shareholders could be weaker (Shleifer and Vishny, 1997). The presence of such countries can influence our results only if they contribute heavily to the sample size. This is the case for Japan, which accounts for almost one-fourth of the sample (125 out of 416 firms). In unreported results (available from the authors), we find that when we exclude Japan from the sample, GNP per capita becomes insignificant and our findings on competition and other firm-level variables remain qualitatively similar.

[8] In Japan, business groups are organized into keiretsus, groups of firms that own control blocks in each other and allow the keiretsu bank to play a major role in corporate financing and managerial enforcement (Berglof and Perotti, 1994; Morck, Wolfenzon, and Yeung, 2005).

Table 1-V: The Impact of Country Characteristics

The dependent variable in each regression is the S&P corporate governance ratings. Softly competitive and Weakly competitive are dummy variables set to one if competition lies in the middle or lowest tercile of the empirical competition distribution, and zero otherwise. Competition is expressed as 1-HHI, where HHI is the Herfindahl-Hirschman Index computed as the sum of squares of firms' industry market shares based on sales; firm sales come from Bureau van Dijk ORBIS. We identify an industry by its two-digit SIC code. Firm-level variables are from Worldscope. Sales growth is inflation-adjusted sales growth winsorized at the 1% level; Dependence on external finance is from Compustat and is computed for U.S. firms in the same industry from 1995-2000 as capital expenditures minus cash flows from operations divided by capital expenditures; Log(Assets) is the log of total assets in U.S. dollars; Ownership is the proportion of shares held by insiders; Cash/Assets is cash holdings scaled by total assets; Foreign sales/Total sales is firm exports divided by net sales; ADR is a dummy variable set to one if the firm has a major U.S. exchange listing and zero otherwise; Country investor protection is the product of the anti-director rights index from Djankov et al. (2008) and the rule of law from ICRG; Stock market capitalization/GDP is the country's stock market capitalization divided by gross domestic product and is from Beck and Demirgüç-Kunt (2009); Log GNP/capita is the log of gross national product per capita and is from WDI; and Developed (Developing) countries comprise countries with GNP/capita above (below) the sample median, where GNP/capita is gross national product per capita and is from WDI. Standard errors are robust to within-country variation; numbers in parentheses are student-t. *, **, and *** reflect significance at the 10%, 5%, and 1% levels, respectively.

	Developed countries		Developing countries	
	(1)	(2)	(3)	(4)
Softly competitive	3.68	2.53	-14.63	-3.18
	(2.73)**	(2.46)**	(-4.45)***	(-1.84)*
Weakly competitive	1.23	2.30	-10.56	-2.31
	(0.83)	(1.87)*	(-3.29)***	(-0.73)
Sales growth	1.85	0.87	0.68	1.38
	(0.74)	(0.47)	(0.17)	(0.46)
Dependence on external finance	0.65	1.54	0.88	0.45
	(1.83)*	(3.75)***	(1.01)	(0.69)
Log(Assets)	1.99	1.61	0.95	0.45
	(4.57)***	(4.14)***	(1.03)	(0.62)
Ownership	-8.57	-1.52	5.97	0.68
	(-2.94)***	(-0.50)	(1.31)	(0.22)
Cash/Assets	8.72	3.90	8.61	3.45
	(1.94)*	(1.11)	(0.80)	(0.44)
Foreign sales/Total sales	5.86	2.46	4.71	4.35
	(3.35)***	(1.87)*	(0.93)	(0.89)
ADR	4.09	3.74	2.06	2.24
	(4.56)***	(4.83)***	(0.84)	(1.18)
Country investor protection	0.61		0.88	
	(5.06)***		(3.76)***	
Stock market capitalization/GDP	0.22		7.46	
	(0.21)		(3.01)***	
Log of GNP/capita	-14.61		0.34	
	(-4.33)***		(0.28)	
Constant	158.41	34.92	14.18	23.16
	(4.33)***	(5.87)***	(0.90)	(2.00)*
Country fixed effects	no	yes	no	yes
Adjusted R^2	0.418	0.711	0.116	0.485
Observations	339	339	160	160

4.3 Robustness tests

In the following subsections we provide results from robustness tests on the relation between competition and corporate governance. [9]

4.3.1 Alternative measures of competition

In this section, we test whether our evidence continues to hold when we use two alternative measures of competition. First, we use a firm's price-cost margin (PCM), an empirical proxy for the Lerner index, which measures the extent to which a firm can set prices above its marginal costs (see Giroud and Mueller, 2010). We construct PCM as net income before extraordinary items scaled by sales. We trim the PCM to ensure that all values fall inside the theoretical bounds of zero and one. A PCM close to one indicates that the firm faces weak competition, while a firm that faces strong competition would have a PCM near zero.

Panel A of Table VI presents results for PCM terciles constructed following the same method that we use to construct competition terciles: strongly, softly, and weakly competitive firms are firms with a PCM in the lowest, middle, and highest PCM terciles. The results for the competition dummies based on the PCM results are similar to those obtained using the concentration measure (i.e., 1-HHI) although the coefficients on the dummies are smaller.

[9] The unreported results mentioned in this section are available from the authors upon request.

Table 1-VI: Robustness Tests

The dependent variable in each regression is the S&P corporate governance ratings. Softly competitive and Weakly competitive are dummy variables set to one if competition lies in the middle or lowest tercile of the empirical competition distribution, and zero otherwise. Competition is expressed as 1-HHI, where HHI is the Herfindahl-Hirschman Index computed as the sum of squares of firms' industry market shares based on sales; firm sales come from Bureau van Dijk ORBIS. We identify an industry by its two-digit SIC code. Firm-level variables are from Worldscope. Sales growth is inflation-adjusted sales growth winsorized at the 1% level; Dependence on external finance is from Compustat and is computed for U.S. firms in the same industry from 1995-2000 as capital expenditures minus cash flows from operations divide by capital expenditures; Log(Assets) is the log of total assets in U.S. dollars; Ownership is the proportion of shares held by insiders; Cash/Assets is cash holdings scaled by total assets; Foreign sales/Total sales is firm exports divided by net sales; ADR is a dummy variable set to one if the firm has a major U.S. exchange listing and zero otherwise; R&D/Total sales is the value of research and development expenditures divided by net sales; Capital expenditures and total debt are scaled by total assets; Country investor protection is the product of the anti-director rights index from Djankov et al. (2008) and the rule of law from ICRG; Stock market capitalization/GDP is the country's stock market capitalization divided by gross domestic product and is from Beck and Demirgüç-Kunt (2009); Log GNP/capita is the log of gross national product per capita and is from WDI. DD and DG represent Developed and Developing countries, respectively; developed and developing countries comprise countries above and below the median GNP/capita, respectively. Panels A and B use alternative competition measures: the price-cost margin (i.e., Lerner index) and the four-firm concentration ratio. Panel C uses corporate governance ratings from Credit Lyonnais Security Asia (CLSA) and from Institutional Shareholders Services (ISS), regressions in columns (7) and (10) include year dummies. Panel D uses firm and country data for year 1999. Panels E and F use firm data for year 2000 with industries defined at the three-digit and four-digit SIC code levels. Panel G includes as control variables R&D/Total sales (R&D), Capital expenditures/Assets (CAPEX), and Debt/Assets (DEBT). Panel H tests for a non-linear relation between competition and S&P corporate governance ratings using the raw competition measure. Standard errors are robust to within-country variation; numbers in parentheses are student-t. *, **, and *** reflect significance at the 10%, 5%, and 1% levels, respectively.

	Panel A Price-cost margin		Panel B Four-firms concentration ratio		Panel C Alternative corporate governance ratings					
	DD	DG	DD	DG	ISS ratings			CLSA ratings		
					2005	2006	2004-2008	2000	2001	2000-2001
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Softly competitive	1.81	-6.13	2.71	-4.10	2.91	3.10	2.69	-2.17	-1.79	-1.32
	(2.37)**	(-2.55)**	(2.48)**	(-1.81)*	(2.90)***	(3.56)***	(3.16)***	(-1.01)	(-1.01)	(-0.73)
Weakly competitive	0.57	-5.27	0.31	-4.29	5.14	5.76	5.22	-6.32	-7.32	-6.63
	(0.41)	(-2.08)*	(0.24)	(-1.75)*	(4.55)***	(3.07)***	(3.47)***	(-2.39)**	(-3.67)***	(-3.33)***
Sales growth	1.62	-4.19	1.27	-3.55	0.65	1.22	0.94	0.53	-0.51	0.24
	(0.63)	(-1.29)	(0.51)	(-1.06)	(0.95)	(2.56)**	(1.67)	(1.86)*	(-0.65)	(0.56)
Dependence on external finance	0.63	1.12	0.51	0.96	0.27	0.03	0.07	2.66	2.12	1.04
	(2.03)*	(1.27)	(2.01)*	(1.05)	(1.68)	(0.14)	(0.37)	(2.73)**	(1.23)	(1.04)
Log(Assets)	2.12	0.81	1.98	0.73	0.15	-0.64	-0.44	-0.75	0.04	-0.12
	(5.13)***	(0.91)	(4.88)***	(0.81)	(0.29)	(-1.08)	(-0.84)	(-0.78)	(0.05)	(-0.18)
Ownership	-9.99	3.90	-9.68	2.96	-8.41	-9.32	-8.91	1.94	-7.93	-1.89
	(-3.46)***	(1.01)	(-3.46)***	(0.76)	(-5.16)***	(-5.75)***	(-4.74)***	(0.43)	(-1.67)	(-0.46)
Cash/Assets	9.64	3.46	8.41	2.99	-5.94	-12.06	-9.86	7.67	8.86	7.83
	(2.23)**	(0.41)	(1.96)*	(0.33)	(-4.13)***	(-8.52)***	(-6.29)***	(1.16)	(1.43)	(1.48)
Foreign sales/Total sales	5.18	2.27	5.22	2.06	3.14	5.48	4.76	6.66	6.54	6.35
	(2.99)***	(0.48)	(3.04)***	(0.44)	(2.06)*	(2.53)**	(2.47)**	(2.40)**	(2.14)**	(2.15)**
ADR	4.13	1.43	4.27	1.47	0.64	0.73	0.73	9.77	7.04	6.31
	(4.61)***	(0.60)	(4.88)***	(0.61)	(0.48)	(0.52)	(0.54)	(3.21)***	(2.78)**	(2.82)**
Country investor protection	0.62	0.61	0.64	0.53	0.41	0.35	0.38	0.56	1.50	0.83
	(5.34)***	(2.90)**	(5.46)***	(2.36)**	(2.16)**	(1.61)	(1.93)*	(2.63)**	(2.34)**	(2.24)**
Stock market capitalization /GDP	0.74	6.01	0.59	6.56	-0.47	0.48	0.85	3.02	2.21	2.90
	(0.67)	(2.83)**	(0.58)	(3.04)***	(-0.34)	(0.32)	(0.56)	(1.37)	(1.24)	(1.38)

Log GNP/capita	-15.27	0.38	-15.05	0.11	-3.01	4.81	2.25	-0.58	-1.57	-1.10
	(-4.41)***	(0.31)	(-4.68)***	(0.09)	(-0.54)	(0.97)	(0.55)	(-0.38)	(-1.13)	(-0.85)
Constant	163.84	15.08	163.29	18.34	63.42	-3.44	14.31	58.66	57.62	57.95
	(4.42)***	(1.18)	(4.66)***	(1.44)	(1.11)	(-0.06)	(0.34)	(6.44)***	(7.03)***	(8.63)***
Adjusted R^2	0.416	0.091	0.425	0.075	0.324	0.343	0.378	0.248	0.242	0.232
Observations	334	147	339	160	1530	1572	6843	232	269	501

Table 1-VI (*continued*)

	Panel D Two-digit SIC (year 1999)		Panel E Three-digit SIC		Panel F Four-digit SIC		Panel G CAPEX, DEBT, R&D		Panel H Nonlinearity	
	DD	DG	DD	DG	DD	DG	DD	DG	DD	DG
	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Softly competitive	4.43	-11.35	3.76	-11.05	2.12	-1.47	4.08	-14.29		
	(3.17)***	(-3.90)***	(2.69)**	(-4.01)***	(1.78)*	(-0.55)	(3.04)***	(-4.26)***		
Weakly competitive	2.88	-10.92	2.95	-12.92	2.48	-7.03	1.87	-10.55		
	(1.93)*	(-3.78)***	(1.97)*	(-4.26)***	(1.87)*	(-2.38)**	(1.27)	(-3.18)***		
Competition									11.06	-20.33
									(1.85)*	(-1.86)*
Competition^2									-15.72	29.59
									(-2.41)**	(2.12)**
R&D/Total Sales							33.50	-194.60		
							(2.08)*	(-1.05)		
Capital expenditures/Assets							-2.87	13.76		
							(-0.18)	(0.59)		
Debt/Assets							-0.12	9.47		
							(-0.04)	(1.43)		
Sales growth	1.92	-2.18	4.05	-2.79	3.59	-4.25	1.47	-0.52	1.23	-1.59
	(1.43)	(-1.12)	(1.38)	(-0.70)	(1.30)	(-0.93)	(0.61)	(-0.13)	(0.47)	(-0.38)
Dependence on external finance	1.05	1.25	0.76	-0.37	0.49	0.58	0.32	0.93	0.87	1.11
	(2.51)**	(1.55)	(1.91)*	(-0.45)	(1.76)*	(0.60)	(1.74)*	(1.05)	(2.00)*	(1.22)
Log(Assets)	1.59	1.19	1.70	1.44	1.77	2.02	2.06	0.56	1.80	1.48
	(3.91)***	(1.51)	(3.79)***	(1.68)	(4.13)***	(1.95)*	(4.60)***	(0.59)	(4.40)***	(1.58)
Ownership	-8.06	-3.59	-11.92	5.80	-15.52	4.00	-7.99	4.69	-9.29	3.93
	(-2.89)***	(-0.76)	(-3.81)***	(1.19)	(-5.34)***	(0.71)	(-2.73)**	(1.02)	(-3.08)***	(0.80)
Cash/Assets	10.37	4.35	9.83	3.70	11.87	8.20	5.98	10.21	8.30	8.15
	(2.58)**	(0.45)	(1.98)*	(0.32)	(2.42)**	(0.72)	(1.37)	(0.89)	(1.90)*	(0.70)
Foreign sales/Total sales	0.76	3.99	7.12	1.81	4.23	0.51	5.36	5.71	1.74	1.11
	(1.45)	(0.89)	(3.73)***	(0.36)	(2.25)**	(0.10)	(3.03)***	(1.14)	(1.78)*	(0.22)
ADR	5.38	2.05	4.20	1.71	4.46	1.87	3.77	2.65	4.69	1.30
	(5.78)***	(0.82)	(4.39)***	(0.69)	(4.62)***	(0.67)	(4.26)***	(1.01)	(5.29)***	(0.52)
Country investor protection	0.34	0.39	0.67	0.76	0.73	0.44	0.62	0.84	0.55	0.74
	(2.61)**	(1.74)*	(4.63)***	(3.40)***	(2.87)***	(1.89)*	(5.00)***	(3.60)***	(4.82)***	(2.94)***
Stock market capitalization/GDP	1.31	6.98	-0.22	7.20	0.50	7.86	0.26	7.67	0.91	6.23

	(0.99)	(3.03)***	(-0.21)	(2.99)***	(0.48)	(2.99)***	(0.24)	(3.02)***	(0.88)	(2.43)**
Log GNP/capita	-13.99	-0.57	-13.39	1.20	-16.98	-0.55	-14.79	-0.09	-16.11	0.30
	(-3.41)***	(-0.49)	(-3.25)***	(0.93)	(-4.39)***	(-0.37)	(-4.39)***	(-0.07)	(-4.95)***	(0.22)
Constant	165.70	29.42	154.54	1.92	190.84	3.88	158.57	19.77	179.76	13.86
	(3.87)***	(1.96)*	(3.58)***	(0.13)	(4.77)***	(0.24)	(4.33)***	(1.19)	(5.24)***	(0.45)
Adjusted R^2	0.362	0.086	0.395	0.114	0.378	0.095	0.424	0.113	0.424	0.107
Observations	339	160	339	160	339	160	339	160	339	160

Our second alternative measure of competition is the four-firms concentration ratio (CONC), computed as the total market share of the four largest firms in each two-digit SIC code industry. Like HHI, CONC measures the extent of market control by larger firms. However, CONC gives less weight to larger firms than HHI. This measure has been used in recent studies (e.g., Giroud and Mueller, 2011; Karuna, 2010). As with the other measures, we split the sample into terciles according to the empirical CONC distribution. The results using CONC, reported in Panel B of Table VI, are comparable to those based on HHI. For developed countries (column (3)), only softly competitive firms have significantly higher corporate governance ratings than strongly competitive firms. For developing countries (column (4)), corporate governance ratings are significantly lower for softly and weakly competitive firms. The evidence in Panels A and B of Table VI provides further support for our predictions, and suggests that our findings are not driven by the choice of a competition measure.

4.3.2 Alternative corporate governance ratings

To assess whether our findings are particular to the S&P measure, we consider alternative corporate governance ratings drawn from Institutional Investor Services (ISS) and Credit Lyonnais Security Asia (CLSA).

ISS started providing corporate governance ratings in 2002 for U.S. companies and in 2003 for non-U.S. companies. ISS compiles ratings by examining firms' annual reports, regulatory filings, and websites. The ratings are based on sixty-four governance attributes for U.S. firms and fifty-five attributes for firms outside the U.S. For each attribute, a firm receives a one if it meets the attribute's implementation threshold, and

zero otherwise[10]. We follow Aggarwal et al. (2011) and retain only the forty-one attributes that are common to both U.S. and foreign firms. The forty-one attributes cover four categories: Board (twenty-four attributes), Audit (three attributes), Anti-takeover (six attributes), and Compensation and Ownership (eigth attributes). We focus on 2005 because this year is associated with more firms and fewer missing firm attributes than earlier years (Aggarwal et al., 2009). The ISS ratings mostly cover developed countries.[11] We obtain the ISS ratings from Aggarwal Website.[12]

The CLSA corporate governance ratings, for 2000, were issued in 2001 for firms across global emerging markets (Gill, 2001). Selection criteria were firm size and investor interest, and firm ratings were based on responses by financial analysts to fifty-seven questions divided into seven categories: management discipline, transparency, independence, accountability, responsibility, fairness, and social responsibility. The first six categories were given a weight of 15% in the corporate governance index and the last was given a weight of 10%.

We report the results using the alternative measures of corporate governance in Panel C of Table VI. The results for the ISS sample (column (5)) are consistent with both Hypothesis II and the results above for developed countries in the S&P sample. The competition dummies indicate that on average firms from softly and weakly competitive industries have respectively 2.91 and 5.14 larger ISS governance ratings than those of firms from strongly competitive industries. For the CLSA sample (column (6)), the

[10] For more details on the ISS ratings, see Aggarwal et al. (2009).
[11] In regressions that we show below, we use the whole panel data set (2004-2008).
[12] The ISS corporate governance ratings are used in recent empirical studies (e.g., Aggarwal et al., 2009; Aggarwal, Erel, Ferreira, and Matos, 2011). For other uses of the CLSA ratings, please see Durnev and Kim (2005) and Doidge et al. (2007).

regression coefficients on the competition dummies suggest that firms from less competitive industries generally have lower corporate governance ratings than firms from competitive industries. Firms from weakly competitive industries exhibit CLSA governance ratings that on average are 6.32 lower than those of firms from strongly competitive industries. The dummy for softly competitive industries takes the expected negative coefficient, but is not statistically significant. Overall, the evidence from the CLSA sample is similar to that reported in Table V for developing countries in the S&P sample.

For the ISS sample, ownership concentration, cash to assets, foreign sales, and country investor protection are significantly related to the ratings, but the dependence on external finance and log of assets are not. In unreported regressions, we control for country fixed effects. The results are similar, but cash to assets becomes insignificant while the log of assets now takes a positive and significant coefficient, and the adjusted R^2 rises to 0.66. For the CLSA sample, firm characteristics such as sales growth, the dependence on external finance, and foreign sales help explain governance ratings. Further, at the country level, stock market capitalization is not significant. When we control for country fixed effects (results are not reported), all firm variables that were significant lose their explanatory power; however, we obtain similar results for the competition dummies, and the adjusted R^2increases from 0.22 to 0.49.

4.3.3 Time effects

A concern is that the results of this study are due to transitory time effects. In particular the year 2000 might coincide with outliers for corporate governance in the

stock market. We can deal with this issue by repeating the regressions using data from earlier years. The S&P ratings were issue only once for year 2000. Therefore, we use ratings from ISS (developed countries) and CLSA (developing countries) to check whether our findings are specific to one year. We obtain ISS ratings from 2004 to 2008 from Aggarwal website. For CLSA, we collect the 2001 ratings from Gill (2002). We present the regression results in Table VI, Panel C. First we repeat the regressions for 2006 for ISS sample and for 2001 for CLSA sample. Then, we use all available years in panel regressions and controlling for time effects. The results (columns (6), (7), (9) and (10) of Table VI) support the evidence displayed in columns (5) for ISS sample and (8) for CLSA sample and discussed in the previous section. These results suggest that a time effect is not an issue of our study.

4.3.4 Other robustness tests

One important concern with our analysis above is that the construction of the governance data might introduce endogeneity in the regressions. The S&P corporate governance ratings were reported in 2001 for year 2000. It could be the case that corporate governance provisions implemented before 2000 already affected some firm characteristics when the ratings were constructed. To address this concern, we re-run regression equation (3) for developed and developing countries using firm-, and country-level variables dating back to 1999. In doing so, we control for the possible influence of corporate governance provisions on the explanatory variables.[13] We report the results in Panel D of Table VI. In short, our inferences remain the same. Firms in softly and weakly

[13] We run the same robustness tests for equation (2) and find similar results. These results are available from the authors upon request.

competitive industries have higher (lower) governance ratings in developed (developing) countries, and coefficients on the firm and country variables exhibit similar coefficients to those based on the data for 2000.

Another concern is that competition measures built at the two-digit SIC code level may include too many unrelated firms in the same industry.[14] To examine the robustness of our results to the choice of industry classification, we investigate the relation between competition and corporate governance ratings using industries classified at the three-digit and four-digit SIC code levels. We also construct the dependence on external finance, which is an industry measure, at the three-digit and four-digit SIC code levels. We report the results of our estimation of equation (3) in Panels E and F of Table VI. We obtain qualitatively similar results for all three industry classifications (three-digit, four-digit, and two-digit SIC code levels), and thus our results are not driven by the choice of industry classification scheme.

We next examine whether other firm characteristics often used in the literature could influence the relation that we document between competition and corporate governance ratings. Research and development is often used as a measure of capital intangibility. Intangibles are harder to monitor, and firms with a higher proportion of intangible capital tend to implement stronger corporate governance (Durnev and Kim, 2005). Research and development data are missing for several firms in 2000. Since companies with a higher proportion of intangibles may have different characteristics

[14] Constructing competition measures for small industries poses several challenges. Competition intensity may not be treated as exogenous since one firm's action can affect the rivalry in the product market. This is likely the case in economically less developed countries with only a few firms in several industries. Further, in narrow industry classifications some firms that are related may be classified into different industries. For example, at the four-digit SIC code level, cane sugar except refining (SIC 2061) and cane sugar refining (SIC 2062) are treated as unrelated although they might actually compete with each other.

(e.g., they may be growth companies), omitting them may introduce a bias in the sample. We follow Durnev and Kim (2005) by replacing the missing values with zero. We also include two variables used in the governance literature (Lins, 2003; Aggarwal et al., 2011), namely, capital expenditures and leverage. Capital expenditures capture the funds used to acquire fixed assets other than those related to acquisitions. In Worldscope, capital expenditures include additions to property, plant, and equipment (PPE) and investment in machinery and equipment. Lins (2003) uses the ratio of capital expenditures to total assets as a proxy for potential investment opportunities; hence this ratio should be positively related to corporate governance. As a measure of leverage, we use total debt to assets to account for the fact that creditors may act as external monitors (Lins, 2003). When we estimate equation (3) including the three variables above, our evidence, reported in Panel G of Table VI, remains unchanged.[15] Research and development is positively related to governance ratings in developed countries but not in developing countries. Capital expenditures and total debt do not appear to be related to corporate governance in developed or developing countries. More importantly, the competition dummies are not affected by the inclusion of these variables in the regression.

Our next test investigates whether our argument that the relation between competition and corporate governance is non-linear holds when we employ an alternative econometric specification. In particular, we estimate equation (3) by replacing the competition dummies with the competition variable and its square.[16] The results in Panel H of Table VI show that the competition variable is always significant at the 10% level

[15] Note that in this regression, industries are classified at the two-digit SIC code level.
[16] See Karuna (2010) for a similar econometric specification.

while its square is significant at the 5% level. In developed countries stronger competition is associated with lower governance ratings (the marginal impact of competition is -14.40, evaluated at the mean level of competition for developed countries of 0.81), whereas in developing countries stronger competition is related to higher governance ratings (the marginal impact is 27.01 evaluated at the mean of 0.80). While these findings provide support for a non-linear relation, they highlight the difference in dynamics across development levels: for developed countries, the negative managerial disciplinary effect dominates, which explains the concavity of the relation, while for developing countries the positive external financing effect is responsible for the convexity of the relation.

To assess the impact of multicolinearity on our results, we estimate the variance inflation factors (VIF) for all variables in our regressions. We find that the VIFs for log(Assets) and log GNP per capita are both above 10, which suggest that these variables might be correlated with one or more other explanatory variables. To address this issue, we drop one or both variables (log(Assets) and log GNP per capita). The results for all other variables remain qualitatively similar.

We also check whether the results may be affected by the difference in the number of firms covered within a country. Following Doidge et al. (2007), we repeat the regressions from Table V by including countries with at least five firms. The results (not reported) remain unchanged.

In summary, the results of this section suggest that our findings are robust to the use of alternative measures of competition and alternative corporate governance ratings.

Moreover, our results continue to hold if we classify industries at the three-digit and four-digit code levels, if we include other firm characteristics, and if we use a different econometric specification.

5. Product market competition, corporate governance, and firm valuation

In previous sections, we establish that the impact of product market competition on corporate governance varies with the level of economic development. We show that competition positively affects governance in developing countries, while it negatively affects governance in developed countries. However, the finding that competition improves governance in developing countries does not necessarily mean that competition-related governance will be relevant for firm value. Using U.S. data, Giroud and Mueller (2011) find that corporate governance is more valuable for firms in less competitive industries than for firms in competitive industries. Our Hypothesis IV posits that in developing (developed) countries, firms from competitive (less competitive) industries will benefit more from good governance. In this section, we investigate whether the data support this hypothesis.

We measure firm value using Tobin's Q, which we define as the market value of equity minus the book value of equity plus total assets divided by total assets. To reduce possible endogeneity related to firms with a good valuation having higher governance ratings, we calculate Tobin's Q for 2001, in contrast to the explanatory variables based on 2000 (Durnev and Kim, 2005). Following Giroud and Mueller (2010, 2011), we estimate the following equations:

$$Q_j = \alpha + \sum_{i=1}^{I-1} d_i + \beta'\left(I_i^{HHI} * CG_j\right) + \gamma' F_j + \delta' C_k + \varepsilon_j, \quad (4)$$

$$Q_j = \alpha + \sum_{i=1}^{I-1} d_i + \sum_{k=1}^{K-1} \tau_k + \beta'\left(I_i^{HHI} * CG_j\right) + \gamma' F_j + \varepsilon_j, \quad (5)$$

where d_i and τ_k are industry and country fixed effects, respectively, I and K are the number of industries and countries, respectively, Q_j is firm j's Tobin's Q, CG_j is the (S&P, CLSA, or ISS) corporate governance rating; F_j is a set of firm-specific control variables (sales growth, total assets, capital expenditures, ownership, leverage, cash holdings, PPE, foreign sales, and research and development; see, e.g., Durnev and Kim, 2005; Aggarwal et al., 2009); C_k is a set of country-level control variables (GNP per capita, stock market capitalization, and investor protection), and I_i^{HHI} is a $(3 * 1)$ vector of competition dummies (strongly, softly, and weakly competitive industries). All variables are described in Table I.

In Table VII, we report the estimates of equations (4) and (5). For developed countries, the relation between the corporate governance ratings and Tobin's Q is positive and significant in softly and weakly competitive industries. For example, the coefficient on *CG*softly competitive* indicates that a one standard deviation increase in corporate governance rating in softly competitive industries is associated with a 0.43 increase in Tobin's Q, a 22.10% increase over a developed countries sample mean of 1.93 (see column (1) of Table VII). For strongly competitive industries from developed countries, we find no significant relation between corporate governance ratings and Tobin's Q. These results extend to a wide set of developed countries the findings of Giroud and Mueller (2011), who show that U.S. firms that benefit from good governance are from

Table 1-VII: Product Market Competition, Corporate Governance, and Valuation

The dependent variable in each regression is Tobin's Q, defined as total assets plus market value of equity minus book value of equity divide by total assets. Strongly, Softly, and Weakly competitive are dummy variables set to one if competition lies in the highest, middle, or lowest tercile of the empirical competition distribution, and zero otherwise. Competition is expressed as 1-HHI, where HHI is the Herfindahl-Hirschman Index computed as the sum of squares of firms' industry market shares based on sales; firm sales are from Bureau van Dijk ORBIS. We identify an industry by its two-digit SIC code. CG is the S&P corporate governance ratings. Firm-level variables are from Worldscope. Ownership is the proportion of shares held by insiders; Sales growth is inflation-adjusted sales growth winsorized at the 1% level; Log(Assets) is the log of total assets in U.S. dollars; Capital expenditures/Assets is CAPEX scaled by total assets; Debt/Assets is total debt to total assets; Cash/Assets is cash holdings scaled by total assets; Property/Assets is PPE divided by total assets; Foreign sales/Total sales is firm exports divided by net sales; R&D/Total sales is the ratio of research and development expenditures to net sales; ADR is a dummy variable set to one if the firm has a major U.S. exchange listing and zero otherwise; Country investor protection is the product of the anti-director rights index from Djankov et al. (2008) and the rule of law from ICRG ; Stock market capitalization/GDP is the country's stock market capitalization divided by gross domestic product and is from Beck and Demirgüç-Kunt (2009); Log GNP/capita is the log of GNP/capita and is from WDI. Developed and developing countries comprise countries above and below the median GNP/capita, respectively. Standard errors are robust to within-country variation; numbers in parentheses are student-t. *, **, and *** reflect significance at the 10%, 5%, and 1% levels, respectively.

	Developed countries		Developing countries	
	(1)	(2)	(3)	(4)
CG *Strongly competitive	0.03	0.02	0.07	0.28
	(1.63)	(0.98)	(2.37)**	(8.75)***
CG *Softly competitive	0.04	0.04	0.05	0.23
	(3.25)***	(2.12)**	(2.34)**	(4.39)***
CG *Weakly competitive	0.03	0.03	0.04	0.18
	(2.33)**	(1.51)	(1.94)*	(2.85)**
Softly competitive	-0.34	-0.07	1.70	0.67
	(-0.52)	(-0.15)	(4.96)***	(0.64)
Weakly competitive	0.83	1.37	1.67	4.54
	(0.89)	(1.78)*	(1.48)	(1.80)
Ownership	-0.45	-0.08	-0.75	-1.96
	(-0.62)	(-0.10)	(-0.60)	(-1.42)
Sales growth	1.33	1.91	-3.11	-3.68
	(1.53)	(1.51)	(-4.44)***	(-1.22)
Log(Assets)	-0.32	-0.36	-0.37	-0.52
	(-4.48)***	(-2.67)**	(-2.52)**	(-1.11)
Capital expenditures/Assets	2.97	1.25	12.13	50.91
	(1.01)	(0.46)	(3.50)***	(6.07)***
Debt/Assets	-0.35	-0.07	-3.46	-4.69
	(-0.52)	(-0.07)	(-2.19)**	(-1.84)*
Cash/Assets	5.38	4.96	14.37	35.96
	(2.17)**	(3.05)***	(2.58)**	(3.99)***
Property/Assets	-0.01	0.16	1.05	2.52
	(-0.02)	(0.20)	(0.45)	(0.58)
Foreign sales/Total sales	-0.53	-0.89	2.05	0.59
	(-0.76)	(-1.36)	(2.77)**	(0.23)
R&D/Total Sales	16.19	18.49	21.72	76.47
	(2.54)**	(3.01)***	(0.49)	(1.35)
ADR	-0.02	0.05	0.39	1.61
	(-0.17)	(0.27)	(0.74)	(1.05)
Country investor protection	0.01		0.11	
	(0.54)		(1.55)	
Stock market capitalization/GDP	-0.01		0.59	
	(-0.07)		(0.38)	
Log GNP/capita	-0.49		-0.83	
	(-0.67)		(-3.31)***	
Industry dummies	yes	yes	yes	yes
Country dummies	no	yes	no	yes
Constant	9.06	4.53	4.89	-11.55
	(1.12)	(2.18)**	(1.69)	(-1.41)
Adjusted R^2	0.480	0.500	0.541	0.566
Observations	309	309	144	144

less competitive industries, which correspond to softly and weakly competitive industries in our setting.

For developing countries, the corporate governance ratings are positively related to Tobin's Q in all industries. However, firms that benefit more from higher ratings are located in strongly and softly competitive industries. In column (3) (see C*G*strongly competitive*), a one standard deviation increase in corporate governance rating in strongly competitive industries is associated with a 0.92 increase in Tobin's Q, a 60.45% increase over the developing countries sample mean of 1.51. The magnitude of the impact of corporate governance ratings in softly competitive industries is lower; for one standard deviation increase in rating, Tobin's Q increases by 0.65, a 43.17% increase over the developing countries sample mean. For weakly competitive industries, each standard deviation increase in corporate governance rating is associated with a 34.54% increase in Tobin's Q over the sub-sample mean. The evidence suggests that the economic impact of good corporate governance increases with the level of competition in developing countries.

We next present the results using the ISS and CLSA samples in Table VIII.[17] Panel A shows that the ISS governance ratings help explain Tobin's Q mostly in weakly competitive industries. For a 9.54 increase in ISS rating (which is one standard deviation of the ISS governance ratings), Tobin's Q increases by 0.19, a 10.54% increase over the sample mean of 1.81 (columns (1)). The coefficients on the interaction terms between ISS governance ratings and competition dummies for strongly and softly competitive

[17] As in the regressions based on the S&P sample, we lead Tobin's Q by one year to reduce endogeneity in the regressions based on the ISS and CLSA samples.

Table 1-VIII: Product Market Competition, Corporate Governance, and Valuation: CLSA and ISS Governance Ratings

The dependent variable in each regression is Tobin's Q, defined as total assets plus market value of equity minus book value of equity divide by total assets. Strongly, Softly, and Weakly competitive are dummy variables set to one if competition lies in the highest, middle, or lowest tercile of the empirical competition distribution, and zero otherwise. Competition is expressed as 1-HHI, where HHI is the Herfindahl-Hirschman Index computed as the sum of squares of firms' industry market shares based on sales; firm sales are from Bureau van Dijk ORBIS. We identify an industry by its two-digit SIC code. CG is either the ISS or CLSA corporate governance ratings. Firm-level variables are from Worldscope. Ownership is the proportion of shares held by insiders; Sales growth is inflation-adjusted sales growth winsorized at the 1% level; Log(Assets) is the log of total assets in U.S. dollars; Capital expenditures/Assets is CAPEX scaled by total assets; Debt/Assets is total debt to total assets; Cash/Assets is cash holdings scaled by total assets; Property/Assets is PPE divided by total assets; Foreign sales/Total sales is firm exports divided by net sales; R&D/Total sales is the ratio of research and development expenditures to net sales; ADR is a dummy variable set to one if the firm has a major U.S. exchange listing and zero otherwise; Country investor protection is the product of the anti-director rights index from Djankov et al. (2008) and the rule of law from ICRG ; Stock market capitalization/GDP is the country's stock market capitalization divided by gross domestic product and is from Beck and Demirgüç-Kunt (2009); Log GNP/capita is the log of GNP/capita and is from WDI. Developed and developing countries comprise countries above and below the median GNP/capita, respectively. Standard errors are robust to within-country variation; numbers in parentheses are student-t. *, **, and *** reflect significance at the 10%, 5%, and 1% levels, respectively.

	Panel A : ISS governance			Panel B : CLSA governance		
Period	2005	2005	2004-2008	2000	2000	2000-2001
	(1)	(2)	(3)	(4)	(5)	(6)
CG *Strongly competitive	0.00	0.00	0.01	0.27	0.22	0.21
	(0.55)	(0.10)	(2.09)**	(2.13)**	(2.19)**	(2.36)**
CG *Softly competitive	0.00	0.00	0.01	0.24	0.25	0.18
	(1.14)	(0.03)	(2.79)**	(1.87)*	(2.36)**	(2.18)**
CG *Weakly competitive	0.02	0.02	0.02	0.07	0.10	0.05
	(3.29)***	(3.53)***	(5.45)***	(1.87)*	(1.75)	(2.19)**
Softly competitive	0.17	0.10	0.17	3.06	1.77	2.58
	(1.66)	(0.91)	(3.03)***	(0.68)	(0.39)	(1.53)
Weakly competitive	0.29	0.65	-0.17	11.09	9.55	8.67
	(1.12)	(2.80)**	(-0.91)	(1.39)	(1.94)*	(2.09)*
Ownership	0.01	0.10	-0.04	3.35	6.50	1.60
	(0.11)	(0.99)	(-0.29)	(0.94)	(1.90)*	(1.10)
Sales growth	0.10	0.10	0.21	-2.59	-0.67	-1.46
	(1.51)	(1.38)	(5.49)***	(-1.23)	(-0.34)	(-1.43)
Log(Assets)	-0.06	-0.04	-0.06	-0.09	-0.02	-0.34
	(-3.38)***	(-1.80)*	(-4.51)***	(-0.21)	(-0.08)	(-1.80)*
Capital expenditures/Assets	3.39	3.15	3.03	-8.12	-2.59	3.20
	(3.72)***	(3.62)***	(2.99)***	(-0.57)	(-0.28)	(0.54)
Debt/Assets	-0.21	-0.16	-0.17	-2.33	1.75	-0.00
	(-1.48)	(-1.08)	(-1.06)	(-0.47)	(0.48)	(-0.00)
Cash/Assets	0.69	0.88	1.13	3.14	3.25	3.47
	(1.91)*	(2.46)**	(3.88)***	(0.40)	(0.37)	(1.94)*
Property/Assets	-0.44	-0.38	-0.32	4.83	-2.99	4.04
	(-3.14)***	(-2.92)***	(-1.89)*	(0.68)	(-0.40)	(1.75)*
Foreign sales/Total sales	0.19	0.12	0.16	3.49	2.95	2.07
	(1.62)	(0.94)	(4.40)***	(1.38)	(2.11)*	(1.78)*
R&D/Total Sales	3.68	3.94	1.92	6.86	-8.21	-11.78
	(3.62)***	(3.46)***	(3.93)***	(0.26)	(-0.94)	(-1.02)
ADR	0.19	0.17	0.13	3.47	4.09	1.79
	(2.89)***	(2.56)**	(3.52)***	(1.03)	(1.03)	(1.55)
Country investor protection	0.01		-0.00	0.10		0.15
	(0.21)		(-0.49)	(1.05)		(0.68)
Stock market capitalization/GDP	-0.09		-0.05	-1.65		0.11
	(-1.81)*		(-1.12)	(-1.03)		(0.15)
Log GNP/capita	0.07		-0.05	-1.13		-0.84
	(0.47)		(-0.43)	(-1.11)		(-2.11)*
Year dummies	no	no	yes	no	no	yes
Industry dummies	yes	yes	yes	yes	yes	yes
Country dummies	no	yes	no	no	yes	no
Constant	0.99	1.26	2.10	-11.22	-25.29	-5.96
	(0.65)	(3.42)***	(1.73)*	(-0.99)	(-2.99)***	(-0.99)
Adjusted R^2	0.288	0.310	0.336	0.397	0.426	0.404
Observations	1434	1434	6140	203	203	417

industries are not statistically significant in single-year regressions (columns (1) and (2), but are significant at the 5% level in a panel regression (column (3)). However, the magnitude of the coefficient on the interaction term for weakly competitive industries is twice that of strongly or softly competitive industries. These ISS results, which are similar to those reported using the S&P governance ratings, are consistent with Hypothesis IV for developed countries; that is, firms in less competitive industries benefit more from good governance than firms in strongly competitive industries.

Panel B reports the results for the CLSA sample. In this sample firms that benefit more from good governance are in strongly and softly competitive industries. For strongly (softly) competitive industries, a one standard deviation (i.e., 13.37) increase in CLSA governance rating is associated with a 3.60 (3.20) increase in Tobin's Q, a 184% (164%) increase over a sample mean of 1.96. For weakly competitive industries: each standard deviation increase in CLSA governance rating increases Tobin's Q by only 47.75% over the sample mean (column (4)). When we use the CLSA governance ratings over two periods (2000 and 2001), the coefficients on corporate governance remains greater for strongly and softly industries (column (6)). These results are consistent with Hypothesis IV, which posits that for developing countries, the impact of corporate governance on firm value is greater in competitive industries.

Endogeneity

Above we address potential endogeneity of corporate governance using lagged values of the independent variables in the valuation regressions. To alleviate any further endogeneity concerns, we employ a system of simultaneous equations using three-stage

least squares (3SLS) that allows for endogeneity between corporate governance and firm value. To do so, we need to identify exogenous variables that affect corporate governance but not valuation. We use firms' alpha and beta as exogenous variables for corporate governance (Durnev and Kim, 2005). The values for alpha and beta come from Worldscope, and are computed using between twenty-three and thirty-five consecutive month-end percentage price changes relative to a local market index.

Alpha captures the amount of returns not related to market factors, and therefore proxies for future expected excess returns. Higher values of alpha may induce a controlling shareholder to implement good corporate governance (Durnev and Kim, 2005). Hence, alpha should be positively related to corporate governance. Beta captures market risk, that is, the contribution of the stock variation to market volatility. The literature suggests that higher market risk indicates more opportunities for insiders (managers and/or controlling shareholders) to profit from inside information (Demsetz and Villalonga, 2001; Durnev and Kim, 2005). We therefore expect beta to be negatively associated with corporate governance.

We estimate the following system of equations:

$$\begin{cases} CG_j = \alpha_1 + \beta_1 Q_j + \theta_{1,1} competition_j + \theta_{1,2} alpha_j + \theta_{1,3} beta_j \\ \qquad + \theta_{1,4} external\ finance_j + \gamma_1' F_j + \delta_1' C_k + \varepsilon_{1,j} \\ Q_j = \alpha_2 + \sum_{i=1}^{I-1} d_i + \beta_2 CG_j + \gamma_2' F_j + \delta_2' C_k + \varepsilon_{2,j} \end{cases}, \qquad (6)$$

where CG_j is the S&P corporate governance rating, Q_j is firm j's Tobin's Q; d_i represents industry i fixed effects, I is the number of industries, F_j is a set of firm-specific control variables (sales growth, total assets, ownership, cash holdings, foreign sales, research and

Table 1-IX: Corporate Governance and Firm Valuation, Three-Stage Least Squares

The dependent variable in each regression is either the S&P corporate governance ratings (CG) or the firm Tobin's Q defined as total assets plus market value of equity minus book value of equity divide by total assets. Competition is expressed as 1-HHI, where HHI is the Herfindahl-Hirschman Index computed as the sum of squares of firms' industry market shares based on sales; firm sales are from Bureau van Dijk ORBIS. We identify an industry by its two-digit SIC code. Less competitive (competitive) comprise firms below (above) the median of the competition measure. Firm-level variables are from Worldscope. Sales growth is inflation-adjusted sales growth winsorized at the 1% level; Dependence on external finance is from Compustat and is computed for U.S. firms in the same industry from 1995-2000 as capital expenditures minus cash flows from operations divide by capital expenditures; Log(Assets) is the log of total assets in U.S. dollars; Ownership is the proportion of shares held by insiders; Cash/Assets is cash holdings scaled by total assets; Foreign sales/Total sales is firm exports divided by net sales; R&D/Total sales is the value of research and development expenditures divided by net sales; Capital expenditures/Assets is CAPEX scaled by total assets; Debt/Assets is total debt to total assets; ADR is a dummy variable set to one if the firm has a major U.S. exchange listing and zero otherwise; Alpha and Beta are measures of excess returns and market risk, respectively. Country investor protection is the product of the anti-director rights index from Djankov et al. (2008) and the rule of law from ICRG; Stock market capitalization/GDP is the country's stock market capitalization divided by gross domestic product and is from Beck and Demirgüç-Kunt (2009); Log GNP/capita is the log of gross national product per capita and is from WDI. Developed and developing countries are subsamples of countries above and below the median gross national product per capita, respectively. Numbers in parentheses are student-t. *, ** and *** reflect significance at the 10%, 5% and 1% levels, respectively.

	Developed countries				Developing countries			
	Less competitive		Competitive		Less competitive		Competitive	
	CG Equation (1)	Valuation Equation (2)	CG Equation (3)	Valuation Equation (4)	CG Equation (5)	Valuation Equation (6)	CG Equation (7)	Valuation Equation (8)
Tobin's Q	0.38		0.05		4.15		0.59	
	(0.23)		(0.16)		(1.43)		(0.36)	
CG		0.04		0.04		0.04		0.09
		(2.13)**		(0.97)		(2.18)**		(3.87)***
Competition	8.66		-3.17		7.52		18.39	
	(2.25)**		(-0.29)		(0.71)		(2.64)**	
Sales growth	10.74	-0.02	0.04	1.26	-18.23	0.40	5.93	-1.73
	(1.98)*	(-0.04)	(0.02)	(2.50)**	(-1.23)	(1.04)	(0.89)	(-2.08)**
Dependence on external finance	0.83		0.41		0.24		3.36	
	(1.87)*		(1.92)*		(0.08)		(2.00)*	
Log(Assets)	5.15	-0.50	2.12	-0.35	4.39	-0.52	5.80	-0.70
	(5.01)***	(-3.06)***	(4.18)***	(-2.54)**	(1.41)	(-4.19)***	(2.64)**	(-3.79)***
Ownership	-5.42	0.17	0.31	0.68	-4.50	0.62	-3.80	1.87
	(-1.04)	(0.33)	(0.08)	(1.03)	(-0.37)	(0.99)	(-0.39)	(1.86)*
Cash/Assets	3.69	3.29	3.03	5.23	-38.07	6.20	-5.80	-1.81
	(0.26)	(2.17)**	(0.62)	(4.56)***	(-0.97)	(4.47)***	(-0.25)	(-0.61)
Foreign sales/Total sales	10.55	-1.22	-0.14	-0.65	-13.25	-0.82	2.92	-0.04
	(2.77)***	(-2.89)***	(-0.22)	(-5.11)***	(-1.01)	(-1.00)	(0.35)	(-0.06)
R&D/Total Sales	82.77	20.89	36.67	26.92	-230.86	-99.96	1149.47	436.37
	(1.49)	(3.75)***	(1.71)*	(5.88)***	(-0.44)	(-1.04)	(1.54)	(4.09)***
Capital expenditures/Assets	-25.86	5.61	-6.81	0.37	-34.51	2.36	5.21	3.06
	(-1.44)	(4.30)***	(-0.43)	(0.11)	(-0.90)	(0.71)	(0.13)	(0.76)
Debt/Assets	-11.85	-0.25	-2.16	0.57	-2.36	0.61	0.39	-1.15
	(-1.83)*	(-0.40)	(-0.72)	(0.81)	(-0.14)	(0.82)	(0.04)	(-0.99)
ADR	3.45	0.22	4.70	-0.45	-5.12	1.02	0.75	0.20
	(1.72)*	(0.89)	(4.96)***	(-1.81)*	(-0.81)	(3.02)***	(0.15)	(0.50)
Alpha	0.06		2.32		-1.35		4.10	
	(0.03)		(1.77)*		(-0.35)		(1.98)*	
Beta	-15.69		0.43		-30.88		-8.42	
	(-1.75)*		(0.14)		(-2.16)**		(-1.23)	
Country investor protection	0.52	-0.06	-0.73	0.03	0.68	0.03	-0.02	-0.14
	(2.46)**	(-3.06)***	(-3.06)***	(0.55)	(0.98)	(0.78)	(-0.06)	(-2.60)**
Stock market capitalization/GDP	-1.26	0.09	20.77	0.19	9.50	-0.24	13.91	1.06
	(-1.18)	(0.79)	(8.17)***	(0.19)	(1.78)*	(-0.78)	(2.08)**	(1.43)
Log of GNP/capita	-2.79	0.08	7.12	-1.41	0.87	0.44	-0.72	-0.18
	(-0.63)	(0.20)	(1.63)	(-1.44)	(0.19)	(1.91)*	(-0.29)	(-0.54)
Constant	-7.74	7.92	-54.62	17.82	-25.14	0.59	-57.32	5.87
	(-0.16)	(1.67)*	(-1.28)	(1.86)*	(-0.57)	(0.26)	(-1.36)	(1.42)
Industry dummies	no	yes	no	yes	no	yes	no	yes
R^2	0.55	0.69	0.68	0.69	0.34	0.74	0.52	0.82
Observations	135	135	153	153	59	59	54	54

development, capital expenditures, debt), and C_k is a set of country-level control variables (GNP per capita, stock market capitalization, and investor protection). For the governance equation, we include alpha, beta, the competition measure, and the dependence on external finance computed at the industry level. We do not include industry dummies in the governance equation since the dependence on external finance is constructed at the industry level and thus controls for industry characteristics. Furthermore, once included in the regressions, the coefficients on the industry dummy variables are not jointly significant (unreported results). This evidence suggests that the dependence on external finance and firm characteristics such as total assets, research and development, and foreign sales control for other industry characteristics that could explain corporate governance (see also Durnev and Kim, 2005).

We report the results for the S&P corporate governance ratings in Table IX.[18] Unlike previous estimations, in this analysis we divide the sample into two levels of competition to ensure we have enough observations in each regression as the inclusion of alpha and beta in the regressions reduces the sample of firms to 113 for developing countries and 288 for developed countries. Competitive (less competitive) industries are industries with competition measures above (below) the sample median of the empirical distribution for competition. The results, which are consistent with those in Tables V through VIII, show that competition is positively associated with governance ratings, but only in less competitive industries for developed countries. Further, corporate governance is positively related to Tobin's Q in competitive and less competitive industries in developing countries (see columns (6) and (8)), but only in less competitive industries

[18] We obtain qualitatively similar results with the ISS and CLSA corporate governance ratings.

from developed countries (columns (2) and (4)). Overall, addressing possible endogeneity through three-stage least squares regressions does not affect the evidence presented in this paper.

Sample selection bias

The corporate governance ratings that we use in this study may induce several biases in the results. First, firms in countries with low economic and financial development or with weak investor protection may be less covered by the ratings because the ratings institutions (S&P, ISS and CLSA) could not finance their surveys in these countries (Doidge et al., 2007). In countries with less ratings covered (particularly developing countries), the relation between competition and corporate governance may be different than that reported here. However, our analysis includes a broad sample of developed and developing countries.

Second, larger firms are more likely to be covered by the S&P and CLSA ratings (Durnev and Kim, 2005; Doidge et al., 2007) as well as the ISS ratings (Doidge et al., 2007). This subjects the results to a sample selection bias. To investigate whether this bias affects our findings, we estimate Heckman two-step selection models for firms in developed and developing countries. We collect data on all non-financial firms covered in Worldscope that are in countries covered by the ratings. We identify 9,477, 9,453, and 5,561, firms for countries surveyed by S&P, ISS and CLSA, respectively. In the first step we estimate probit models for the probabilities of coverage by S&P, ISS and CLSA ratings. Following Doidge, Karolyi and Stulz (2007) we further include in the first step models two variables, ROA and debt, in addition to those included in equation (3). Then,

Table 1-X: Product-market competition, corporate governance and valuation, Heckman Selection Models

The dependent variable in columns 1 and 3 (2 and 4) is the S&P corporate governance ratings - CG - (the firm Tobin's Q defined as total assets plus market value of equity minus book value of equity divide by total assets). Strongly, Softly, and Weakly competitive are dummy variables set to one if competition lies in the highest, middle, or lowest tercile of the empirical competition distribution, and zero otherwise. Competition is expressed as 1-HHI, where HHI is the Herfindahl-Hirschman Index computed as the sum of squares of firms' industry market shares based on sales; firm sales are from Bureau van Dijk ORBIS. We identify an industry by its two-digit SIC code. Dependence on external finance is from Compustat and is computed for U.S. firms in the same industry from 1995-2000 as capital expenditures minus cash flows from operations divide by capital expenditures. Firm-level variables are from Worldscope. Ownership is the proportion of shares held by insiders; Sales growth is inflation-adjusted sales growth winsorized at the 1% level; Log(Assets) is the log of total assets in U.S. dollars; Capital expenditures/Assets is CAPEX scaled by total assets; Debt/Assets is total debt to total assets; Cash/Assets is cash holdings scaled by total assets; Property/Assets is PPE divided by total assets; Foreign sales/Total sales is firm exports divided by net sales; R&D/Total sales is the ratio of research and development expenditures to net sales; ADR is a dummy variable set to one if the firm has a major U.S. exchange listing and zero otherwise; Country investor protection is the product of the anti-director rights index from Djankov et al. (2008) and the rule of law from ICRG ; Stock market capitalization/GDP is the country's stock market capitalization divided by gross domestic product and is from Beck and Demirgüç-Kunt (2009); Log GNP/capita is the log of GNP/capita and is from WDI. Developed and developing countries comprise countries above and below the median GNP/capita, respectively. Lambda is the inverse Mills' ratio drawn from the Heckman selection model first stage. In the Heckman selection model first stage (probit results are unreported), the dependent variable is a dummy equals to one if the firm has an S&P ratings and zero otherwise - firms not covered by the ratings are from Worldscope. Standard errors are robust to within-country variation; numbers in parentheses are student-t. *, **, and *** reflect significance at the 10%, 5%, and 1% levels, respectively.

	Developed Countries		Developing Countries	
	CG	Valuation	CG	Valuation
	(1)	(2)	(3)	(4)
CG *Strongly competitive		0.01		0.04
		(1.30)		(2.71)***
CG *Softly competitive		0.02		0.03
		(1.97)**		(1.95)*
CG *Weakly competitive		0.02		0.01
		(1.72)*		(0.82)
Softly competitive	3.41	0.28	-12.07	1.14
	(3.08)***	(1.04)	(-3.11)***	(1.83)*
Weakly competitive	1.48	0.21	-7.41	1.48
	(1.25)	(0.53)	(-1.95)*	(1.49)
Dependence on external finance	0.48		0.04	
	(1.96)*		(0.05)	
Ownership	-10.73	0.07	-1.08	-0.12
	(-4.42)***	(0.13)	(-0.18)	(-0.16)
Sales growth	1.64	1.08	-0.35	-0.05
	(1.65)*	(2.49)**	(-0.09)	(-0.10)
Log(Assets)	2.38	-0.44	2.32	0.08
	(3.70)***	(-3.76)***	(1.29)	(0.28)
Cash/Assets	8.04	4.94	4.97	8.36
	(1.98)**	(5.28)***	(0.44)	(5.87)***
Foreign sales/Total sales	5.75	-0.20	5.33	1.31
	(3.91)***	(-1.26)	(1.10)	(1.82)*
Debt/Assets		0.53		-2.21
		(0.81)		(-2.23)**
R&D/Total Sales		14.59		66.00
		(6.77)***		(3.21)***
Capital expenditures/Assets		5.44		-0.16
		(2.36)**		(-0.05)
Property/Assets		-0.94		0.25
		(-1.69)*		(0.30)
ADR	4.92	-0.16	3.04	0.32
	(4.42)***	(-0.74)	(1.04)	(0.91)
Country investor protection	0.59	0.00	0.98	0.05
	(5.76)***	(0.22)	(3.57)***	(1.36)
Stock market capitalization/GDP	0.40	0.19	8.35	-0.35
	(0.56)	(1.30)	(2.83)***	(-0.91)
Log GNP/capita	-11.05	-0.49	-0.73	-0.07
	(-4.71)***	(-1.01)	(-0.32)	(-0.24)
Inverse Mills' ratio	0.91	0.15	2.85	0.08
	(0.54)	(0.56)	(0.70)	(0.13)
Industry dummies	no	yes	no	yes
Constant	115.33	11.55	-1.44	-2.90

	(4.40)***	(2.11)**	(-0.07)	(-0.93)
Observations	7238	7119	2224	2185

in the second step, we correct for self-selection by including the inverse Mills' ratio (computed from the estimated probabilities in the first step) in equations (2) through (5). We present the regressions for S&P ratings. In Table X, the results for equations (3) and (4) for developed and developing countries are similar to those reported in Tables V and VII (columns (1) and (3)). Unreported results for ISS and CLSA are also similar to those uncorrected for selection bias. Overall, the results suggest that sample selection bias does not affect the evidence presented in this paper.

Overall, we find that in developed countries, corporate governance ratings are associated with an increase in firm value only in less competitive industries. These results extend the evidence of Giroud and Mueller (2011) for U.S. firms and Ammann et al. (2011) for countries from the European Union to a wide set of developed countries. These results are consistent with competition increasing managers' effort to maximize firm value and thereby reducing the need for stronger governance (the managerial discipline effect), and with competition and corporate governance acting as substitutes. In developing countries, however, corporate governance ratings are related to an increase in firm value mostly in competitive industries, suggesting that corporate governance might be an important issue in these countries, with competition and corporate governance acting as complements in encouraging value-maximization.

6. Conclusion

In this study, we empirically investigate (1) the relation between competition and corporate governance ratings, (2) how country characteristics influence this relation, and (3) how this relation affects firm value. Using a multinational sample of firms domiciled in 38 countries, we first show that product market competition is significantly related to governance ratings, but in a non-linear way. Further, the nonlinearity varies with the level of economic development. For developed countries, firms from strongly competitive industries exhibit lower governance ratings than firms from weakly competitive industries. In contrast, for developing countries, firms from strongly competitive industries have higher governance ratings than firms from weakly competitive industries.

We next investigate whether the effect of corporate governance on firm value depends on the level of product market competition. We find that corporate governance ratings are positively associated with firm value, but only in softly and weakly competitive industries from developed countries. For developing countries, the evidence suggests that corporate governance is valuable in strongly, softly, and weakly competitive industries. However, the magnitude of the impact of corporate governance on firm value appears to be greater in strongly competitive industries.

Our findings have important implications for corporate governance. First, governments from weak corporate governance countries (or weak investor protection), generally domiciled in developing countries, may consider the benefits of strengthening product market competition rather than imposing costly governance mechanisms on firms. Second, given that a "formal convergence" of the governance system through a

change in the legal protection of investors is unlikely (because of the political challenge to change laws (Coffee (1999)), governments from developing countries may accelerate the "functional" convergence of the governance of firms towards that of firms in developed countries by introducing policies that intensify competition in the product market. This government strategy would also be attractive for the shareholders of the firm since it is usually accompanied by an increase in the market value of the firm.

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Essay 2: Credible Reforms and Stock Return Volatility: Evidence from Privatization[19]

Abstract

In this paper we investigate how the progress of market-oriented reforms such as privatization affects stock return volatility and how this impact varies with the level of economic development. We show that privatization is related to volatility via political risk. Indeed, a privatization program maintained over time signals government credibility, and this process gradually resolves political risk and reduces volatility. Volatility decomposition shows that the sustainability of the privatization program is associated mainly with lower idiosyncratic volatility among developed markets, while it is strongly related to the systematic volatility of developing markets. Additional tests suggest that the reduction in volatility components is greater when a sustained privatization program is carried out through the stock market. Finally, our results indicate that although all public firms benefit from the resolution of political risk, firms that are fully or partly government-owned experience a greater reduction in volatility.

JEL Classification: G10, G34, G38, O10

Keywords: privatization, investor's confidence, stock return volatility, political risk, multivariate analysis, econometrics.

[19] Cet article a été co-écrit avec Jean-Claude Cosset et Pascale Valéry.

I- Introduction

This paper investigates how the progress of market-oriented reforms such as privatization influences stock return volatility. Privatization – defined as the deliberate sale of state-owned enterprises or assets to firms in the private sector – is often viewed as a response to the failure of government ownership to promote efficiency. Thus, an important argument in favor of privatization is that state-owned companies are not efficient because they address the objectives of politicians rather than maximize profits (Boycko, Shleifer, and Vishny, 1996). Indeed an extensive literature points to the benefit of private ownership, which emerges as a consequence of changes in incentives, with greater emphasis on profitability and efficiency (see, e.g., Megginson and Netter, 2001). At the country level, privatization is often associated with stock market development (Boutchkova and Megginson, 2000) and excess returns in emerging economies (Perotti and van Oijen, 2001). In this paper we intend to learn more about the impact of privatization by investigating the link between privatization and stock return volatility, an issue that remains unexplored.

It is important to understand volatility, particularly its systematic and idiosyncratic components, because of its implications for investors and for the economy. For an investor, the upward move in idiosyncratic volatility affects his/her portfolio and hedging strategies. As pointed out by Campbell, Lettau, Malkiel, and Xu (2001), the number of stocks needed to fully diversify a portfolio depends on their level of idiosyncratic volatility. Accordingly, to ensure that his/her portfolio remains well diversified, the investor must compensate for the increasing idiosyncratic volatility with a

corresponding increase in the number of stocks. Further, investors may require a higher risk premium for carrying highly volatile stocks; hence, higher systematic volatility could imply a higher cost of capital (Bollerslev, Engle, and Wooldridge, 1988; Bekaert and Harvey, 1997). Regarding the economy, Wurgler (2000) shows that countries with lower correlation among stocks, and hence higher average idiosyncratic volatility, allocate their capital efficiently. Further, higher systematic volatility may prevent new firms from initiating public offerings as the cost of capital rises. Hence, volatility may increase the value of the option to wait and delay investments, thereby affecting overall economic development (see Bekaert and Harvey, 1997). In this paper, we extend the literature on volatility and turn our attention to a factor that might influence stock return volatility, namely the privatization reforms that have predominated in most countries over the past three decades.

Finance theory does not offer a clear relation between market-oriented reforms and volatility (Bekaert and Harvey, 2003). Following the reforms, volatility may increase either because the market is informationally more efficient as prices quickly react to new information, or because hot speculative capital flows into the country; however, if volatility was unusually high before the reforms, it may decrease during the reforms with the gradual development and diversification of the market (Bekeart and Harvey, 2003). We argue that the launching of a credible privatization reform establishes a favorable market sentiment concerning political risk, which typically affects volatility. Perotti's (1995) model introduces uncertainty about a government's commitment to its privatization policy. A committed government carries out its declared privatization policy, while an uncommitted government will reverse its policy in order to address its

own political objectives (rather than those related to efficiency). Investors will delay their participation in the privatization program until this uncertainty is resolved. Perotti's (1995) model suggests that the implementation of a sustained privatization program signals its credibility, which reduces the political risk perceived by investors concerning the government's commitment to market-oriented policies. Thus, the resolution of political uncertainty through credible privatization would imply lower volatility.

We document that (systematic and idiosyncratic) volatility is lower during the privatization process. This change is also economically significant. Additional analyses reveal that the progress of privatization (i.e., the sustainability of a privatization program) reduces volatility through the resolution of political risk. Specifically, while showing that privatization is associated with less political risk, we find that the component of political risk that is explained by privatization is negatively related to both systematic and idiosyncratic volatility.

Next we investigate whether the relation between privatization and volatility holds across levels of economic development. The literature suggests that the volatility of emerging markets is higher than that of developed markets (Bekaert and Harvey, 1997) and that political risk is of greater importance in emerging markets (e.g., Perotti and van Oijen, 2001). We thus contrast the volatility of developed and developing countries. We find that, following privatization programs, the drop in volatility is greater in developing countries than in developed countries. Further, in developing countries this drop is due primarily to the systematic component of volatility – that is, the non-diversifiable risk – while in developed countries the decline in volatility is generally due to the idiosyncratic component.

Furthermore, we examine whether the method of privatization affects the aforementioned relation. Privatizations via share offerings are more transparent than those through asset sales (Megginson, 2010). Therefore, the assessment of a privatization policy's credibility should be less difficult and the resolution of policy uncertainty more complete via the stock market. We observe that privatization sales via the stock market are strongly associated with lower systematic and idiosyncratic volatility, while privatization sales through asset sales are (at best) weakly related to systematic volatility.

We further present firm-level results. Following Perotti (1995), we argue that firms are unequally exposed to risk of government policy reversal. Indeed, the risk of policy reversal should be greater for firms that are fully or partly government-owned. We distinguish between privatized firms (share issue privatization) and other public firms (initial public offerings – IPOs). Consistent with our argument, we find that, in general, the progress of privatization is negatively related to the volatility of all firms but that this relation is statistically and economically stronger for privatized firms. Further, the progress of privatization is associated mostly with lower idiosyncratic volatility of IPO firms, while it mainly reduces the systematic volatility of privatized firms.

Overall, the results reported in this paper suggest that privatization reforms are negatively related to volatility through the resolution of political risk and that this relation varies with the level of economic development. The results further suggest that a privatization policy gains more credibility when it is carried through the stock market and sustained over time. Finally, although privatized firms might experience greater reduction in volatility, privatization reforms affect all firms in the stock market. Additional

robustness tests to control for observed and unobserved country characteristics and to address endogeneity issues do not affect our results.

Our work is related to two strands of the literature. First, a large body of literature studies the impact of political events on volatility (e.g., Manning, 1989; Bittlingmayer, 1998; Voth, 2002; Mei and Guo, 2004; Beaulieu, Cosset, and Essadam, 2005). Other published studies relate volatility to political risk ratings (Boutchkova, Doshy, Durnev, and Molchanov, 2012; Bartram, Brown, and Stulz, 2012). To our knowledge, our study is the first to reveal that the credibility of a privatization reform is related to volatility through the resolution of political risk, particularly the risk of policy reversal.

Our study also belongs to the literature on market-oriented reforms and volatility. For example, Bekaert and Harvey (1997), who compare pre- and post-liberalization volatility in emerging markets, suggest that financial liberalization reforms do not drive up market volatility. We extend this literature by showing that credible privatization reforms are associated with lower volatility.

The rest of the paper is arranged as follows. Section II presents the literature on privatization, political risk, and volatility. Section III describes the sample construction and defines the variables that will be used in the paper. Section IV describes the methodology and presents some descriptive statistics. Sections V and VI present our empirical findings and some robustness tests. Section VII concludes the paper.

2- Privatization and the Political Risk Channel

In this section we discuss the theoretical and empirical literature that examines how privatization programs through the political risk channel could influence the systematic and idiosyncratic volatility of stock returns in a country.

Political risk is defined as the probability of occurrence of political events that affect firm profits or investments (Robock, 1971; Bekaert, Harvey, Lundblad, and Siegel, 2012). If political risk is priced (e.g., Erb, Harvey, and Viskanta, 1996; Bekaert and Harvey, 1997; Butler and Joaquin, 1998; Bilson, Brailsford, and Hooper, 2002), then a political event (e.g., expropriation or nationalization of property or resources; inconvertibility of currency; politically based regulations on operations [Howell and Chaddick, 1994]) that could threaten expected returns might drive up stock return volatility. Indeed, the empirical literature suggests that political uncertainty faced by investors impacts on stock return volatility. Beaulieu et al. (2005) show that unfavorable (favorable) political news between 1990 and 1996 related to the possible separation of Quebec from Canada led to an increase (decrease) in firms' total volatility. Boutchkova et al. (2012) argue that political uncertainties caused by regular political events (e.g., election cycles, rotation of parties in power, incremental changes in political risk scores) could explain stock return volatility. Using a sample of 50 countries, they show that higher political risk is associated with higher industry-level systematic and idiosyncratic volatility.

In contrast, other political events, such as the launching and implementation of a sustained privatization program that resolves political risk – at least the risk of a policy

reversal – could drive down stock return volatility. Examples of policy reversal would be for the government to interfere with the privatizing firms by reallocating resources to preferred constituencies; to discontinue an ongoing privatization program; or, in the extreme case, to re-nationalize privatized firms (like the Mexican banks in 1994-1995). The literature on privatization describes the conditions under which the perception of policy reversal is less likely. Perotti's (1995) model suggests that only the implementation of a sustained privatization program is credible and that it gradually resolves policy uncertainty about a political commitment to a market-oriented policy. His model introduces uncertainty about the government's commitment to its privatization policy. While the committed government will carry out its declared privatization policy, the uncommitted (or "populist") government will reverse its policy once privatization revenues are raised.[20] This uncertainty, referred to as perceived political risk, may deter investors from participating in the privatization program.

Following Perotti and van Oijen (2001) and Perotti and Laeven (2002), we argue that the credibility of the privatization program will affect the market sentiment with respect to overall government policy. The authors contend that the success of privatization requires the development of a more favorable institutional environment and that a privatization program maintained in the long run builds investor confidence in the government's commitment to market-oriented policies. Credible privatizations will also reduce the uncertainty surrounding government's other policies and hence decrease the systematic volatility. Furthermore, a sustained privatization program does not affect all

[20] Privatization is often a response to difficult economic conditions (Perotti and van Oijen, 2001). For example, the government may announce a privatization program to resolve a public deficit. After the first privatization wave (i.e., after privatization revenues are raised), the government faces no financial pressure to pursue the privatization program. Hence, an uncommitted government may interfere with the privatizing firms or terminate the privatization program.

firms equally. Indeed, some firms, such as monopolies and companies that are in protected industries, are more sensitive to public policy choices, and therefore the reduction in policy uncertainty surrounding them will be greater (Perotti, 1995). As a result, it should decrease idiosyncratic volatility.[21]

In summary, we expect stock return volatility to decrease with the gradual development of a privatization program. More importantly, if this program is sustained over time and therefore credible, systematic and idiosyncratic volatility will decrease through the resolution of policy uncertainty.

3- Sample Construction and Description of Variables

Our privatization sample begins with all privatization deals reported in the Security Data Corporation (SDC) International Merger and Acquisition database, complemented with privatization initial public offerings from SDC Global New Issues.[22] For each country, we sum up all transaction values each year to construct yearly country-by-country revenues from privatization sales. We match this initial sample with data on volatility measures constructed from Datastream. Our panel data set is based on a sample

[21] Previous empirical evidence supports the view that political risk could be firm-specific rather than country-specific. For example, before the British 1987 general election, there was a rumor that a Labour government would re-nationalize the formerly privatized British Telecom (BT). The probability of the Labour Party's winning the election represented a risk to BT investors, since it was expected that the new government would not fully compensate them. Manning (1989) finds this risk to have driven BT stock return volatility up from 1985 to 1987. Manning shows that this effect was specific to BT and did not affect overall market volatility. The key point is that the market might have viewed the potential re-nationalization of BT as an isolated risk affecting only one firm, which may be diversified away.

[22] These SDC databases report privatization transactions only of 500,000 USD or more; however, these transactions are representative of the population of major privatization deals (Bortolotti, Fantini, and Siniscalco, 2003).

of 47 countries over a span of 6 to 20 years between 1990 and 2009. Thus the panel is unbalanced, with some countries having more data than others.

3.1- Privatization Variables

To investigate the impact of privatization on volatility, we first follow Perotti and van Oijen (2001) and construct a privatization variable as the yearly ratio of total gross revenues from privatization sales to the country's gross domestic product (GDP) (all values are expressed in US dollars). This variable provides a measure of the intensity of privatization – that is, a measure of the government's willingness to privatize. However, the intensity of privatization is not a credible indicator that the government is fully committed to its privatization policy, since an uncommitted government may reverse its policy once the privatization revenues are raised. In such a case, investors will be reluctant to participate in future privatization sales. In contrast, a committed government is willing to bear some residual risk through gradual privatizations. Further, if the privatization program involves several firms, a committed government will spread privatization sales over time to establish credibility (Perotti, 1995).

To measure the credibility of the privatization program, we follow Perotti and Laeven (2002) and Boubakri, Cosset, and Smaoui (2009) and use the progress of privatization, a variable that we compute as follows: for each period *t*, we take the temporal average of privatization sales over GDP from the beginning of the study period. We expect that the greater the sustainability of the privatization policy, the greater the indicator of privatization progress and thus the building of investor confidence.

3.2- Political Risk Variables

As discussed above, the literature suggests that political risk can explain the volatility of stock returns. Our main measures of political risk come from the *International Country Risk Guide* (ICRG). We use the political risk index that measures the political stability of a country. The index contains such components as government stability, socio-economic conditions, internal and external conflicts, corruption, religious and ethnic tensions etc. It ranges from 0 (high political risk) to 100 (low political risk). Most of these components are not relevant for our purpose since they are related more to political turmoil than to policy uncertainty. Indeed, in the context of privatization, by political risk we mean the risk perceived by investors that the government will not commit to its declared privatization policy. To measure political risk that is related to economic policies, we use the ICRG composite risk rating, which comprises elements from political risk, economic risk, and financial risk. The economic risk is an assessment of current economic strength (per capita GDP, GDP growth, inflation, budget balance and current account balance); financial risk, on the other hand, measures a country's ability to service its debts. Hence, the ICRG composite risk ratings measure overall policy uncertainty. The composite risk ratings range from 0 (very high) to 100 (very low).

Finally, as a robustness test, we use the country credit ratings from *Institutional Investor*. This proxy is based on information provided by leading global banks, money managers, and security firms. The respondents are surveyed by *Institutional Investor* to rate each country on a scale of 0 to 100. Higher ratings represent lesser likelihood of default. The survey is held in March and September every year. For each year, we take

the simple average as our political risk measure. The survey comprises factors such as the country's political uncertainty, debt services, and economic issues. Respondents seem to put more weight on political uncertainty (which may increase the likelihood of default), which suggests that they are concerned about the government's ability to sustain good economic policy (Perotti and van Oijen, 2001). The ratings are forward-looking, as respondent are concerned about the chance of default based on current policies. Lower political risk is expected to be associated with lower volatility.

3.3- Investor Protection

Morck, Yeung and Yu (2000) argue that countries that protect property rights well have stock markets that are characterized by less co-movement among individual stocks and higher idiosyncratic volatility.[23] They contend that when property rights are well protected, the benefit for risk-return arbitrageurs (i.e., informed traders) to spend time and money to collect firm-specific information and do informed trading is high. Morck et al. (2000) conclude that weak property rights will discourage informed trading and create large systematic price swings.[24] Morck et al. (2000) further measure public investors'

[23] Morck et al. (2000) measure property rights using the *good government index,* which is a combination of three indices: corruption, the risk of contract repudiation by the government, and the risk of expropriation of private property by the government. The *good government index* cannot be computed, because two components (the risk of contract repudiation and the risk of expropriation of private property) were discontinued in 1997 (http://www.prsgroup.com/prsgroup_shoppingcart/pc-62-7-iris-dataset.aspx). In the robustness tests presented below, we consider this *good government index* in cross-sectional (Fama-Macbeth) regressions.

[24] Weak property rights protection may also discourage new investment. Pistor and Spicer (1996) and Frye and Shleifer (1997) provide evidence that weak property rights protection has deterred investment in Russia and the Czech Republic since these countries launched their privatization programs in the early 1990s; they find that in Poland, where property rights are strongly protected, the market has grown faster. Johnson, McMillan, and Woodruff (2002) surveyed 300 private manufacturing firms in Poland, Romania, Russia, Slovakia, and Ukraine in 1997, asking about their investment decisions and about property rights issues. They report that in Russia and Ukraine firms perceive property rights to be weak and reinvest their earnings at a lower rate, but that in Poland and Romania both perceived property rights and earnings reinvestments are high. The authors conclude that weak property rights protection discourages firms from reinvesting

protection using the "anti-director rights" index from La Porta, Lopez-De-Silanes, Shleifer, and Vishny (1998). They argue that this measure is more relevant for stock markets in countries with an effective legal system (that is, with strong law enforcement). Likewise, Li, Morck, Yang, and Yeung (2004) show that financial reforms that are followed by reinforcement of property rights are associated with greater firm-specific volatility.[25]

To measure property rights protection, we use the product of two variables. The first variable is the revised "anti-director rights" index from Djankov, La Porta, Lopez-De-Silanes, and Shleifer (2008). This index assesses the extent of laws protecting minority investors against expropriation by corporate insiders and controlling shareholders. It ranges from 0 to 5, with higher values indicating stronger protection of minority investors. The second variable of property rights protection is the "law and order" index from ICRG. This is defined as an assessment of the strength, impartiality, and effectiveness of the legal system. The index ranges from 0 to 6, with higher values indicating less possibility of property rights violation without effective sanctions. Hence, the product of these two variables gauges the existence as well as the enforcement of laws protecting investor rights.[26] The literature suggests that stronger property rights are associated with lower systematic volatility or higher idiosyncratic volatility (Morck et al., 2000; Li et al., 2004).

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their profits, as they face a higher risk of expropriation. This suggests that strong property rights protection strengthens investor confidence on the market system.

[25] As discussed also in Stulz (2005) and Bartram et al. (2012), with stronger (investor) property rights protection, the agency problems between corporate insiders and outside investors are reduced and corporate insiders do not need to invest much of their wealth in the company shares. Therefore, insiders' wealth is less exposed to the firm-specific risk; as a result, they undertake riskier projects, which increases the idiosyncratic volatility of the firm's stocks.

[26] For similar measures, the reader is referred to Durnev and Kim (2005) and Doidge, Karolyi, and Stulz (2007).

3.4- Economic and Financial Development

The degree of economic and financial development are two other factors that play a role in the determination of stock return volatility (Bartram et al., 2012). Countries that are economically developed are likely to be more (economically) diverse. In those countries, therefore, stocks are less dependent on one sector of the economy. As a result, stock co-variances and thus the market volatility decrease (e.g., Bekaert and Harvey, 1997). We measure economic development using the logarithm of per capita GDP from the world development indicators. Per capita GDP should be negatively related to stock return volatility, particularly its systematic component.

The degree of development of a particular stock market may convey information on the amount of risk undertaken by firms. Bartram et al. (2012) find that financial development is relevant for explaining the idiosyncratic component of stock return volatility. Greater financial development indicates that risk is diversified (or shared) among a large base of investors. Consequently, risk becomes less important and firms carry out riskier projects, thereby increasing their unexpected (idiosyncratic) volatility. Financial development is measured using the ratio of the country stock market capitalization to GDP. We expect financial development to be positively related to volatility, particularly its idiosyncratic component.

3.5- Economic Instability

There is evidence that stock return volatility is higher during recessions (Officer, 1973; Schwert, 1989). Likewise, Errunza and Hogan (1998) find that macroeconomic

instability helps predict stock return volatility. Beltratti and Morana (2006) also find support for this evidence for S&P 500 firms. Diebold and Yilmaz (2008) generalize this evidence to more than forty countries around the world. To control for macroeconomic instability, we use the standard deviation of per capita GDP growth over five years (Morck et al., 2000). We expect higher macroeconomic instability to be associated with higher stock return volatility.

3.6- Product Market Competition

A strand of the literature relates idiosyncratic volatility to product market competition. Gaspar and Massa (2006) show that strong competition in the product market increases the amount of uncertainty (about the firm's future cash flows) faced by investors. As a consequence, uncertainties are incorporated into today's stock prices, which reflect the present value of expected future cash flows. Hence, the more intense the product market competition, the more uncertain the investors and the more volatile the firm's stock prices. We follow Morck et al. (2000) and construct firm and industry Herfindahl indices that measure market concentration. Hence, the greater the indices, the weaker the product market competition. The firm Herfindahl index (firm concentration) is the sum of squared market shares of all firms at the country level. The industry Herfindahl index (industry concentration) is computed as the sum of squared market shares of all SIC two-digit code industries at the country level. Morck et al. (2000) interpret higher values of firm and industry concentration measures as the dominance of a few firms and the lack of industry diversity. Data on sales are from

Datastream/Worldscope. As discussed earlier, these variables should be positively related to systematic volatility but negatively related to idiosyncratic volatility.

3.7- Equity Market Liberalization

The finance literature suggests mixed evidence as to whether volatility increases or decreases following stock market reforms. Volatility may increase due to speculative money flowing into the country or due to stock markets becoming more efficient as prices quickly react to new information; however, volatility may decrease in the long run after liberalization, with the gradual development and diversification of the stock market (Bekaert and Harvey, 2003).

To isolate the impact of privatization from financial liberalization on stock return volatility, we control for liberalization using a measure of the intensity of liberalization from Bekaert, Harvey, and Lundblad (2005). This measure reflects the number of restrictions imposed on foreign investment in the local stock market. It is based on the ratio of market capitalization of the stock included in the International Finance Corporation (IFC) investable index to the market capitalization of the stock comprising the IFC global index. The IFC global index represents the overall market portfolio for a country, while the IFC investable index represents the market portfolio of local stocks that are available to foreign investors. Thus, an open market will have a ratio of one – that is, all local stocks are available to foreign investors – whereas a closed market will have a ratio of zero – that is, no local stock is available to foreign investors. The intensity of liberalization is computed for developing countries. Developed countries are expected to

have fully liberalized their market before the beginning of our study period in 1990.[27] The relation between the intensity of liberalization and stock return volatility can be positive or negative.

3.9- Volatility Measures

To investigate the relation between privatization and return volatility, we use stock market data from Datastream.[28] We collect weekly stock return indices (RI), which include dividends and price changes. We use weekly returns because daily data may be missing for several countries for which trading is infrequent due to low market liquidity. Common stock returns are expressed in US dollars. The results remain the same when we use local currency returns. To enter the sample, a firm must have at least 25 weeks of returns in a particular year.[29] We drop common stock returns that exceed 0.75 in absolute value to avoid the possible noisy influence of outliers. Total volatility is estimated each year for each stock as,

$$\sigma_i = \sqrt{\frac{1}{T-1}\sum_{t=1}^{T}\left(r_{i,t} - \frac{1}{T}\sum_{t=1}^{T} r_{i,t}\right)^2}, \qquad (1)$$

where σ_i is stock *i* total volatility, $r_{i,t}$ is the weekly (t) return, and T is the number of weeks of stock returns for the stock in a particular year. We compute country total volatility by averaging σ_i over every stock in a country each year. Country total volatility is then annualized by multiplying it by the square root of 52.

[27] The official liberalization dates are from Bekaert et al. (2005).
[28] For studies using a similar methodology as presented in this section, the reader is referred to Boutchkova et al. (2012), Bartram et al. (2012), and Morck et al. (2000).
[29] We obtain essentially the same results if we rule our sampling differently by including firms with relevant stock returns of more than 25 weeks – that is, up to 30 weeks as in Morck et al. (2000).

A change in total volatility can be explained by a change in its components – that is, systematic and/or idiosyncratic volatility. To examine whether privatization affects total volatility components, we make use of an international market model where returns depend on local as well as global factors. For stock i,

$$r_{ijt} = \alpha_i + \beta_{1,i} r_{j,t} + \beta_{2,i} r_{world,t} + e_{it} \quad (2)$$

where r_{ijt} is the return for stock i on week t in country j, r_{jt} is the country j market return index on week t, and $r_{world,t}$ is the MSCI world index on week t. Country and World indices are from Datastream. For each stock i and for each year, we compute systematic and idiosyncratic return volatility as the standard deviation of the explained and unexplained component, respectively, of weekly returns in equation (2). For each country, we obtain annual volatilities by taking the average of systematic and idiosyncratic volatility across all firms in a given year and multiplying them by the square root of 52. We take the log of these volatility measures.

4- Empirical specification and Statistics

4.1- Model specification

To investigate the relation between privatization and volatility, we estimate the following equation:

$$Volatility_{j,t} = \beta \times Privatization_{j,t} + \gamma \times Control\ Variables_{j,t} + \alpha_j + \delta_t + \varepsilon_{j,t} \quad (3)$$

where j represents the country and t the time period (year). The dependent variable is the logarithm of the average (total, systematic, or idiosyncratic) volatility. Privatization is either the current privatization sales to GDP (the intensity of privatization) or the temporal average of this ratio (the progress of privatization). The control variables include investor protection (ICRG law and order index times the anti-director rights index from Djankov et al. [2008]), firm and industry product market concentration measures, the logarithm of per capita GDP, the volatility of GDP growth, the country stock market capitalization, and a measure of country's degree of liberalization (liberalization intensity). In the regression, we include country (α_j) and year (δ_t) fixed effects to account for unobserved heterogeneïty. This methodology has the advantage of mitigating the problem of omitted variable bias.

Table 2-I: Variable Definitions and Sources

Variable	Definition	Source
Volatility Measures		
Total Volatility (TVOL)	Annualized standard deviation of weekly returns from 1990 to 2010. All stocks with less than 26 weeks of returns are excluded, and returns are trimmed at -.75 and +.75. Country averaged for country-level regressions.	Author calculations. Returns are obtained from Datastream
Systematic Volatility (SVOL)	Annualized standard deviation of the explained component from International CAPM model, on weekly returns from 1990 to 2010. Standard deviations are defined as square root of the regression sum of squares divided by the number of parameters minus one. All stocks with less than 26 weeks of returns are excluded, and returns are trimmed at -.75 and +.75. Country averaged for country-level regressions.	
Idiosyncratic Volatility (IVOL)	Annualized standard deviation of the residuals from International CAPM model, on weekly returns from 1990 to 2010. Standard deviations are defined as square root of the residuals sum of squares divided by the number of weeks used in regression minus the number of parameters. All stocks with less than 26 weeks of returns are excluded, and returns are trimmed at -.75 and +.75. Country averaged for country-level regressions.	
Privatization Measures		
Intensity of privatization	Annual privatization sales over GDP	Author calculations. SDC Platinum, Thomson Financial, and World Development Indicators (WDI)
Progress of privatization	Temporal average of privatization sales over GDP from the beginning of the study period to period *t*.	
Progress of privatization (PS)	Temporal average of privatization sales by private sales over GDP from the beginning of the study period to period *t*.	
Progress of privatization (PO)	Temporal average of privatization sales by public offerings over GDP from the beginning of the study period to period *t*.	
Proportion of public offerings	Ratio of the number of public offerings to the total number of privatized firms, each year.	
Country Risk Ratings		
Political risk	Assessment of a country's political stability	International Country Risk Guide (ICRG)
Composite risk	Assessment of a country's economic strengths and weaknesses, ability to service its debt, and political stability	
Country risk	Yearly average of sovereign credit ratings. The ratings are disclosed each year in March and September.	Institutional Investor
Property Rights and Investor Protection Indices		
Law-and-order index	Assessment of the strength, impartiality, and effectiveness of a country's legal system. The index ranges from zero to six.	ICRG
Anti-director rights index	Measure of the legal protection of minority investors against expropriation by corporate insiders and controlling shareholders. The measure lies in zero and five.	Djankov et al. (2008)
Good government index	Morck et al. (2000) index of property rights – a combination three indices: corruption index, risk of government expropriation, and risk of contract repudiation	Jin and Myers (2006)
Financial and Economic Measures		
Stock capitalization/GDP	Ratio of stock market capitalization over GDP	World Bank Financial Structure
Stock market turnover	Ratio of a country's annual trading volume to the total number of shares outstanding	World Bank Financial Structure
GDP per capita	Logarithm of GDP per capita	WDI
Volatility of GDP	Standard deviation of GDP growth over five years	Author calculations. WDI
Public debt/GDP	Ratio of the country's public debt in percentage of its GDP	Fiscal Monitor, International Monetary Fund (IMF)
Industry concentration	Sum of squared market shares of all industries (SIC two-digit) in the country	Author calculations. Worldscope/Datastream
Firm concentration	Sum of squared market shares of all firms in the country	
Earnings co-movement index	Measure of the synchronicity of returns on assets, as in Morck et al. (2000)	
Research and development	Country average of firm-level research and development expenses to total assets	
Intensity of liberalization	Index of the intensity of liberalization from Bekaert et al. (2005)	
Firm-Level Regression Variables		
SIP dummy	Dummy variable set to one if the firm is a share issue privatization (SIP) and zero otherwise	Author calculations. SDC Platinum, and WDI
IPO dummy	Dummy variable set to one if the firm is an Initial public offering (IPO) and zero otherwise	
Privatization progress (SIP)	Measure of privatization progress multiplied by the SIP dummy	
Privatization progress (IPO)	Measure of privatization progress multiplied by the IPO dummy	
Total assets	Logarithm of total assets	Author calculations.

PPE/assets	Property, plant, and equipment scaled by total assets	Worldscope/Datastream
RD/assets	Research and development scaled by total assets	
Cash/assets	Cash and short-term investment divided by total assets	
Market-to-book	Common equity price over book value per share	
Gross profit margin	Gross income divided by net sales	
Leverage	Ratio of total debt (long-term plus short-term) to total assets	
Dividend dummy	Dummy variable set to one if the firm pays dividend and zero otherwise	
Product market concentration	Sum of squared market shares of all firms in each industry (SIC two digit)	

4.2- Descriptive statistics

Table II provides country descriptive statistics for our main variables. Volatility measures vary markedly across countries, as shown by the standard deviations in Panel A. Further, average systematic volatility ranges from 0.12 for Belgium to 0.36 for Turkey, while average idiosyncratic volatility lies at 0.21 for Belgium and 0.56 for India. In the ten countries with the highest average systematic (idiosyncratic) volatilities, eight (eight) are emerging markets. However, of the ten countries with the lowest average systematic (idiosyncratic) volatilities, only two (three) are developing countries. These summary statistics suggest that volatility is higher in developing countries than in developed countries. These findings are in line with empirical studies on volatility across countries (Bekaert and Harvey, 1997; Bartram et al., 2012).

Panels B, C, and D of Table II report summary statistics across the measures of privatization and the levels of economic development. In Panel B, using the median, we divide the sample into low and high intensity of privatization. We find no evidence that volatility varies across levels of intensity of privatization. In other words, changes in the size of privatization sales do not appear to be associated with changes in volatility.

Next, using the privatization progress variable, which measures the credibility of privatization, we divide the sample, around the median, into low and high progress. The results, presented in Panel C, show that higher progress of privatization is associated with lower volatility. The mean differences are all statistically significant at the 1% level for total, systematic, and idiosyncratic volatility. This evidence supports the hypothesis that a sustained privatization program reduces political uncertainty. Finally, we divide the

Table 2-II: Summary Statistics

This table reports summary statistics of the main variables used in the study. All variables are described in Table I. Privatization measures are expressed in percentages. Panel A contains summary statistics by country, averaged values across years from 1990 through 2009. Country × years is the number of years a country appears in the sample. Panels B through D, report the mean difference tests (with unequal variances) of volatility, privatization and GDP per capita split according to three groups: intensity of privatization (Panel B, low intensity vs high intensity) progress of privatization (Panel C, low progress vs high progress), and economic development (Panel D, developing vs developed). TVOL is total volatility, SVOL is systematic volatility, and IVOL is idiosyncratic volatility. Mean difference is the difference between the values of two levels of the same group. P-values represent significance levels. *, **, and *** reflect significance at the 10%, 5%, and 1% level, respectively.

Panel A : By country

Country	Country-years	TVOL	SVOL	IVOL	Intensity of privatization	Progress of privatization	GDP per capita	Political risk ratings	Composite risk ratings	Law-and-order
Argentina	14	0.54	0.30	0.44	1.17	1.33	7077.52	71.04	68.64	4.11
Australia	20	0.53	0.25	0.47	1.03	1.01	26821.45	84.76	81.28	5.89
Austria	20	0.29	0.14	0.25	0.50	0.48	30620.65	86.65	85.32	6.00
Belgium	13	0.24	0.12	0.21	0.63	0.41	29906.38	81.04	82.61	5.45
Brazil	19	0.58	0.25	0.44	0.61	0.58	4663.66	65.70	65.82	2.64
Canada	19	0.57	0.27	0.50	0.14	0.18	27195.70	84.95	84.19	5.98
Chile	15	0.28	0.14	0.24	0.41	0.50	5648.41	76.20	77.37	4.92
China	17	0.52	0.25	0.44	0.36	0.28	1422.45	67.39	75.01	4.69
Colombia	14	0.33	0.17	0.27	0.73	0.53	3119.10	55.67	63.59	1.48
Czech Republic	14	0.30	0.14	0.26	1.63	1.09	9675.49	79.46	77.60	5.21
Denmark	15	0.29	0.14	0.25	0.47	0.52	38121.34	86.90	85.64	6.00
Egypt	10	0.46	0.26	0.37	0.60	0.66	1634.17	62.68	68.83	3.90
Finland	17	0.38	0.19	0.33	1.22	0.88	26756.94	89.03	85.34	6.00
France	20	0.36	0.17	0.31	0.59	0.42	28848.61	79.30	79.84	5.20
Germany	20	0.37	0.18	0.32	0.35	0.29	29320.95	83.62	83.55	5.45
Greece	17	0.47	0.25	0.39	0.91	0.81	17068.14	75.43	72.86	4.11
Hungary	14	0.43	0.21	0.36	1.34	1.70	7916.74	79.87	74.89	4.73
India	16	0.66	0.32	0.56	0.13	0.14	609.38	61.01	67.89	4.00
Indonesia	16	0.58	0.29	0.50	0.31	0.38	1229.22	54.45	62.62	2.89
Ireland	8	0.37	0.19	0.32	0.91	0.81	35267.51	88.35	85.32	6.00
Israel	15	0.46	0.22	0.40	0.59	0.83	18898.00	63.74	70.44	5.00
Italy	20	0.30	0.16	0.25	0.73	0.67	24714.39	76.80	77.91	4.86
Japan	15	0.40	0.21	0.34	0.13	0.19	35155.06	81.74	84.62	5.41
Jordan	9	0.40	0.21	0.33	1.90	1.66	2313.51	71.11	72.85	4.00
Malaysia	17	0.46	0.24	0.39	0.77	1.16	4479.08	73.01	78.13	3.81
Mexico	17	0.32	0.17	0.27	0.51	0.90	6193.07	70.24	71.40	2.73
Morocco	11	0.30	0.18	0.23	1.59	1.22	1921.35	70.89	73.29	5.38
Netherlands	18	0.29	0.15	0.25	0.72	1.10	31798.86	88.03	85.70	6.00
New Zealand	13	0.37	0.17	0.33	1.30	2.86	16347.44	85.21	81.25	5.94
Norway	19	0.38	0.19	0.32	0.87	0.68	47018.74	86.35	89.30	6.00
Pakistan	10	0.43	0.22	0.36	0.80	0.58	651.81	51.93	59.81	3.14
Peru	16	0.37	0.17	0.32	1.13	1.55	2550.54	60.42	66.28	2.97
Philippines	17	0.53	0.26	0.46	0.80	0.67	1188.36	60.50	65.02	2.83
Poland	16	0.52	0.27	0.44	0.95	0.89	6461.30	78.37	76.50	4.59
Russia	14	0.54	0.29	0.45	0.84	0.51	4544.00	62.23	68.75	3.71
Singapore	20	0.45	0.23	0.38	0.70	0.65	24165.79	83.69	87.31	5.45
South Africa	11	0.41	0.19	0.36	0.32	0.40	3960.14	69.08	71.52	2.50
South Korea	18	0.60	0.30	0.51	0.31	0.28	13180.30	76.58	79.67	4.64
Spain	18	0.30	0.16	0.25	0.62	0.61	18466.66	76.36	77.25	4.89
Sri Lanka	8	0.48	0.27	0.38	0.58	0.43	823.65	56.88	62.52	3.24
Sweden	19	0.42	0.22	0.36	1.18	0.96	33841.02	86.57	84.28	6.00
Switzerland	9	0.27	0.13	0.23	0.53	0.55	41984.83	87.20	88.87	5.76
Taiwan	14	0.47	0.24	0.40	0.46	0.33	12818.51	78.03	83.75	4.50
Thailand	18	0.47	0.24	0.40	0.36	0.47	2635.94	65.61	71.99	3.97
Turkey	19	0.65	0.36	0.53	0.45	0.21	5236.55	59.26	59.84	4.08

United Kingdom	20	0.31	0.15	0.27	0.46	0.82	27707.94	82.85	81.16	5.76
Venezuela	6	0.63	0.33	0.53	0.96	1.30	3543.82	64.46	65.94	4.00
Total	725									
Mean		0.43	0.21	0.36	0.71	0.73	16435.95	74.8078	76.41	4.66
Standard deviation		0.17	0.09	0.14	1.05	0.59	14789.49	11.16	8.86	1.29

Table 2-II (*continued*)

	country× years	TVOL	SVOL	IVOL	Intensity of privatization	Progress of privatization	GDP per capita
Panel B : By levels of intensity of privatization							
Low intensity	360	0.43	0.22	0.36	0.12		17878.77
High Intensity	365	0.43	0.21	0.36	1.29		15012.89
Mean difference		0.01	0.00	0.00	-1.18		2865.88
P-values		0.63	0.65	0.99	0.00***		0.00***
Panel C : By levels of progress of privatization							
Low Progress	360	0.46	0.23	0.39		0.34	16069.87
High Progress	365	0.40	0.20	0.34		1.11	16797.01
Mean difference		0.06	0.02	0.05		-0.77	-727.14
P-values		0.00***	0.00***	0.00***		0.00***	0.51
Panel D : By levels of economic development							
Developing	310	0.48	0.24	0.40	0.69	0.71	3426.75
Developed	415	0.39	0.19	0.33	0.72	0.74	26153.66
Mean difference		0.09	0.05	0.07	-0.02	-0.03	-22726.91
P-values		0.00***	0.00***	0.00***	0.77	0.46	0.00***

sample into developing and developed countries.[30] The subsample for developing (developed) countries comprises countries classified as low and middle (high) income according to the World Bank income classification. We present the results in Panel D of Table II. Volatility is higher for developing countries. The results also show that the intensity and the progress of privatization are similar in developing and developed countries, suggesting that the willingness of the government to privatize and the credibility of privatization do not vary with the level of economic development.

In summary, as shown in Panel A, volatility measures are dispersed across countries. Furthermore, results from Panels C and D suggest that privatization and the level of economic development might have their own effect on volatility. In other words,

[30] The literature suggests that volatility of emerging markets may be different from that of developed markets (Bekaert and Harvey, 1997). We discuss this evidence below.

the credibility of privatization affects volatility irrespective of economic development, and vice versa. In the following sections, we perform a multivariate analysis of the relation between privatization and volatility.

5- Multivariate Analysis

5.1- Privatization and Volatility

We report the results in Table III. In all regressions, volatility is either total, systematic, or idiosyncratic. In Panel A we regress volatility on privatization sales to GDP, the measure of the intensity of privatization. The coefficient of the intensity of privatization is negative for all three volatility measures but is significant only for systematic volatility. The intensity of privatization provides weak support for the prediction that privatization reduces volatility. This result suggests that contemporaneous privatization sales do not lead to strong credibility for government policy.

In Panel B of Table III we replace privatization intensity with the progress of privatization, which measures the sustainability of this policy over time and thus signals credibility. The coefficient of the progress of privatization is negative and significant for all three types of volatility. An increase in privatization progress of one standard deviation (0.006) is associated with a decrease in total volatility of 0.054, a 12.53% decline over the sample mean of 0.43. For systematic and idiosyncratic volatility, the decreases associated with a standard deviation increase in privatization progress are 32.88% and 14.81%, respectively. These results are consistent with the conjecture that credible privatization that builds investor confidence decreases systematic volatility and

is accompanied by a reduction in idiosyncratic volatility. The latter effect reflects the heterogeneous exposure of firms to the risk of government policy reversal.

The evidence from the control variables supports the literature. Investor protection is associated with greater total volatility, but only through the idiosyncratic component. This result is consistent with the view that improved property rights protection favors informed trading (Morck et al., 2000) and risk taking (Bartram et al. (2102), which results in higher firm-specific volatility. Stock market capitalization/GDP is positively associated with idiosyncratic volatility, as risk is more diversified in financially developed countries and thus firms undertake riskier projects. The positive relation between stock market capitalization/GDP and systematic volatility could be explained by the presence of noise traders in liquid markets, which typically increases this volatility. As predicted, GDP per capita is associated with lower systematic volatility only and economic instability (volatility of GDP) is positively related to all three volatility measures. Industry concentration decreases idiosyncratic volatility, while firm concentration increases systematic volatility. This finding is consistent with the conjecture that high product market concentration is associated with low uncertainty about future cash flows, which induces lower idiosyncratic volatility (see Gaspar and Massa, 2006), or higher product market concentration means lack of diversity, which leads to higher systematic volatility, as presented in the variable description. Finally, the intensity of liberalization does not appear to affect volatility.

Overall, the evidence in Table III suggests that the progress of privatization, by reducing political risk, reduces total and systematic volatility as well as idiosyncratic volatility. In the following section, we provide further results with regard to this evidence

Table 2-III: Privatization and Volatility

This table reports values from country level regressions of the logarithm of either total volatility (TVOL), systematic volatility (SVOL) or idiosyncratic volatility (IVOL) on privatization measures, further including control variables. All variables are defined in Table I. All regressions include country and year fixed-effects (not reported). Panel A tests the impact of the intensity of privatization on volatility; and Panel B tests the impact of the progress of privatization on volatility. Standard errors are clustered by country; numbers in parentheses are p-values. *, **, and *** reflect significance at the 10%, 5%, and 1% level, respectively.

	Panel A			Panel B		
	(1) TVOL	(2) SVOL	(3) IVOL	(4) TVOL	(5) SVOL	(6) IVOL
Intensity of privatization	-1.34	-2.28	-1.60			
	(0.16)	(0.04)**	(0.14)			
Progress of privatization				-8.98	-11.51	-8.89
				(0.00)***	(0.00)***	(0.00)***
Investor Protection	0.02	0.01	0.02	0.02	0.01	0.02
	(0.00)***	(0.17)	(0.00)***	(0.00)***	(0.27)	(0.00)***
Stock capitalization/ GDP	0.20	0.27	0.19	0.22	0.29	0.21
	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***
GDP per capita	-0.11	-0.45	-0.08	-0.12	-0.39	-0.09
	(0.16)	(0.00)***	(0.30)	(0.12)	(0.00)***	(0.24)
Volatility of GDP	0.71	0.92	0.64	0.65	0.85	0.58
	(0.00)***	(0.01)***	(0.00)***	(0.00)***	(0.01)**	(0.00)***
Industry concentration	-0.24	-0.16	-0.44	-0.25	-0.20	-0.45
	(0.19)	(0.58)	(0.03)**	(0.18)	(0.50)	(0.02)**
Firm concentration	0.21	1.18	0.25	0.22	1.19	0.26
	(0.31)	(0.00)***	(0.32)	(0.32)	(0.00)***	(0.33)
Intensity of liberalization	0.06	0.19	0.02	0.10	0.16	0.05
	(0.50)	(0.21)	(0.82)	(0.29)	(0.28)	(0.56)
Constant	0.48	1.92	-0.04	0.67	1.56	0.15
	(0.48)	(0.00)***	(0.95)	(0.32)	(0.01)***	(0.83)
Observations	718	718	718	718	718	718
Adjusted R-square	0.645	0.712	0.619	0.652	0.718	0.625

by investigating the political risk link hypothesis.

5.2- Substantiating the relation between privatization and volatility

In this section we provide empirical evidence on the link between privatization and volatility. First we examine whether privatization is related to political risk measures and then we investigate whether privatization and political risk have their own effects on volatility.

5.2.1- The impact of privatization on political risk

To assess this link, we regress political risk on the progress of privatization. As discussed in section 3, we measure political risk using the ICRG political risk and composite risk ratings and the credit risk ratings from *Institutional Investors.* We present the results in Table IV. In addition to the progress of privatization, we control for stock market capitalization, GDP per capita, the intensity of liberalization, investor protection, and the ratio of public debt to GDP. All variables are described in Table I. The ICRG political risk ratings and the credit risk ratings are bound between zero and hundred; hence, we use a Tobit regression model, which is designed to estimate the linear model when the dependent variable is censored at the left and/or the right. All regressions include country and year fixed effects to control for unobserved heterogeneity.

The results support our view that privatization reduces political risk. In column (1) of Table IV, the coefficient of the progress of privatization is positive, but significant only at the 10% level. We have argued that this ICRG political risk measure is less relevant for the purpose of our study as it is related more to internal turmoil such as conflicts, religious and ethnic tensions, and government instability than to uncertainty about economic policy. Therefore, this weak relation between privatization and ICRG political risk is somehow expected (see also Perotti and van Oijen [2001], who consider the intensity of privatization). In the next two columns, the dependent variables are better proxies for policy uncertainty because they are more related to government policy (see section III for a detailed discussion of the composite risk and credit risk). In columns (2) and (3), the coefficient of the progress of privatization is significant at the 1% level: the

Table 2-IIV: Exploring the Links between Privatization and Volatility

This table reports values from the Tobit regressions of political risk measures on the progress of privatization and control variables. All variables are described in Table I. All regressions include country and year fixed-effects. Standard errors are clustered by country; numbers in parentheses are p-values. *, **, and *** reflect significance at the 10%, 5%, and 1% level, respectively.

	(1) Political risk	(2) Composite risk	(3) Credit risk
Progress of privatization	69.28	151.53	125.65
	(0.10)*	(0.00)***	(0.01)***
Stock capitalization/ GDP	2.48	1.45	2.91
	(0.00)***	(0.00)***	(0.00)***
GDP per capita	-1.14	2.87	6.44
	(0.29)	(0.01)**	(0.00)***
Intensity of liberalization	2.77	3.23	11.02
	(0.06)*	(0.04)**	(0.00)***
Public debt/ GDP	-0.04	-0.03	-0.17
	(0.00)***	(0.00)***	(0.00)***
Investor protection	0.92	0.62	0.29
	(0.00)***	(0.00)***	(0.00)***
Constant	69.33	32.55	-30.70
	(0.00)***	(0.00)***	(0.01)***
Observations	718	718	718
Pseudo R-squared	0.319	0.321	0.387

credibility of privatization is associated with higher risk ratings, suggesting that privatization does indeed reduce policy uncertainty. In summary, progress in privatization loads negatively on country-wide political risk. In the next section we provide evidence on the relation between privatization, political risk, and volatility.

5.2.2- The political risk link hypothesis

We have demonstrated that privatization reduces volatility and have argued that this occurs through the reduction in political risk, as shown in Table IV. Thus far, we have treated privatization as the main determinant of political risk. In this section we investigate whether privatization and political risk have their own effects on volatility. Specifically, we examine whether the component of political risk that is related to privatization is associated with volatility. To test this political risk channel, we follow the approach adopted by Ferreira and Laux (2007) and separate the political risk component

Table 2-V: The Political Risk Link Hypothesis

This table reports values from country level regressions of the logarithm of either total volatility (TVOL), systematic volatility (SVOL) or idiosyncratic volatility (IVOL) on explained and residual values of political risk (obtained from regression political risk measures on the progress of privatization) and control variables. All variables are defined in Table I. All regressions include country and year fixed-effects. Standard errors are clustered by country; numbers in parentheses are p-values. *, **, and *** reflect significance at the 10%, 5%, and 1% level, respectively.

	Panel A: Political risk			Panel B: Composite risk		
	(1) TVOL	(2) SVOL	(3) IVOL	(4) TVOL	(5) SVOL	(6) IVOL
Political risk *predicted*	-0.06	-0.06	-0.06			
	(0.00)***	(0.00)***	(0.00)***			
Political risk *residuals*	-0.01	-0.01	-0.01			
	(0.06)*	(0.02)**	(0.03)**			
Composite risk *predicted*				-0.14	-0.09	-0.14
				(0.00)***	(0.01)**	(0.00)***
Composite risk *residuals*				-0.01	-0.02	-0.01
				(0.01)***	(0.00)***	(0.01)***
Investor Protection	0.02	0.01	0.02	0.02	0.01	0.02
	(0.00)***	(0.16)	(0.00)***	(0.00)***	(0.09)*	(0.00)***
Stock capitalization/ GDP	0.23	0.31	0.22	0.23	0.31	0.22
	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***
GDP per capita	-0.11	-0.07	-0.08	-0.09	-0.07	-0.06
	(0.15)	(0.54)	(0.30)	(0.26)	(0.57)	(0.46)
Volatility of GDP	0.59	0.88	0.52	0.53	0.75	0.45
	(0.00)***	(0.00)***	(0.01)***	(0.01)***	(0.02)**	(0.02)**
Industry concentration	-0.31	-0.21	-0.52	-0.34	-0.26	-0.55
	(0.13)	(0.49)	(0.02)**	(0.10)*	(0.41)	(0.01)**
Firm concentration	0.26	1.18	0.31	0.26	1.15	0.31
	(0.27)	(0.00)***	(0.27)	(0.27)	(0.00)***	(0.28)
Intensity of liberalization	0.11	0.02	0.07	0.13	0.05	0.09
	(0.23)	(0.86)	(0.45)	(0.16)	(0.74)	(0.35)
Constant	5.29	3.65	4.77	11.12	6.16	10.46
	(0.00)***	(0.05)**	(0.00)***	(0.00)***	(0.05)**	(0.00)***
Observations	718	718	718	718	718	718
Adjusted R-square	0.654	0.729	0.627	0.657	0.733	0.630

that is explained by privatization from the part that is unrelated to privatization. First, we regress the political risk variables on the progress of privatization and collect the predicted values and the residuals of political risk. The residuals represent the component of political risk that is orthogonal to privatization. Next, we run regression (3) by replacing privatization progress with the predicted values and the residuals of political risk.

We present the results for ICRG political risk (Panel A of Table V) and ICRG composite risk (Panel B). Unreported results for *institutional Investor* credit risk are similar to that of ICRG composite risk. In both panels the coefficients for the predicted

values of political risk and composite risk are statistically significant at the 1% level, suggesting that privatization directly affects volatility (systematic and idiosyncratic). The negative and significant coefficients of the residuals of political and composite risk are consistent with the literature on the impact of political events and political news on volatility (e.g., Beaulieu et al., 2005; Bartram et al., 2012; Boutchkova et al., 2012). Overall, the evidence in Table V provides support for the conjecture that privatization affects volatility through the reduction in political risk.

5.3- The impact of the level of economic development

It is well known that emerging equity markets exhibit characteristics (e.g., higher sample average returns, lower correlations with market returns from developed countries, more predictable returns, higher volatility) that are different from those of developed equity markets (Bekaert and Harvey, 1997). Furthermore, the literature suggests that political risk is more of an issue in emerging markets than in developed markets. Perotti and Laeven (2002) show that credible privatizations are associated with lower political risk in emerging markets. Bilson et al. (2002) provide evidence of a strong relation between political risk and stock returns in emerging markets but not in developed markets. Since higher political risks may induce higher volatility, as shown in the literature and supported in this paper, the literature cited above suggests that the impacts of political risk, and hence of privatization, on volatility will be greater in emerging markets than in developed markets.[31]

[31] For studies on political risk and volatility that cover developed countries as well as developing countries, the reader is referred to Boutchkova et al. (2012) and Bartram et al. (2012). However, these studies do not investigate whether political risk affects volatility differently in developed and developing countries.

To investigate whether privatization affects volatility in both developing and developed countries, we divide our sample according to the World Bank income levels: high-income countries are deemed developed countries, while middle- and lower-income countries are deemed developing. This approach gives us 25 developed and 22 developing countries (including emerging countries). Then we repeat regression (3) on each subsample. As shown in Table VI, the results suggest that the progress in privatization is associated with lower volatility in both developed and developing countries but the economic significance of the coefficients is much greater in developing countries. Specifically, the progress of privatization has a greater impact on idiosyncratic volatility in developed countries, while its impact is more pronounced for systematic volatility in developing countries. For example, a one standard deviation (i.e., 0.006) rise in the progress of privatization is associated with a 13.83% (17.60%) drop in systematic (idiosyncratic) volatility, holding the other variables at their mean values, while the same rise in privatization progress decreases systematic (idiosyncratic) volatility by 46.70% (20.33%) in developing countries.

Table VI shows some results worthy of mention. First, investor protection is positively associated with total and idiosyncratic volatility, but only in developed countries. This result is consistent with that of Morck et al. (2000) on the existence of a threshold level of institutional development associated with stock price asynchronicity. These authors show that in emerging markets, unlike in developed markets, stock price co-movement is unrelated to changes in the strength of property rights protection. The evidence presented here supports their findings by showing that idiosyncratic volatility is unrelated to investor protection in developing countries. Second, stock market

Table 2-VI: The Impact of the Level of Economic Development

This table reports values from country level regressions of the logarithm of either total volatility (TVOL), systematic volatility (SVOL) or idiosyncratic volatility (IVOL) on the progress of privatization, further including control variables. All variables are defined in Table I. All regressions include country and year fixed effects. Developed (Developing) countries are high (low and middle) income countries in accordance with the World Bank income classification. Standard errors are clustered by country; numbers in parentheses are p-values. *, **, and *** reflect significance at the 10%, 5%, and 1% level, respectively.

	Developed Countries			Developing Countries		
	(1) TVOL	(2) SVOL	(3) IVOL	(4) TVOL	(5) SVOL	(6) IVOL
Progress of privatization	-8.55	-4.38	-9.68	-17.71	-18.68	-13.55
	(0.01)***	(0.07)*	(0.00)***	(0.01)***	(0.00)***	(0.06)*
Investor Protection	0.02	0.01	0.02	0.01	0.02	0.01
	(0.03)**	(0.50)	(0.03)**	(0.13)	(0.12)	(0.15)
Stock capitalization/ GDP	0.02	0.10	0.02	0.19	0.18	0.20
	(0.71)	(0.14)	(0.71)	(0.04)**	(0.02)**	(0.05)**
GDP per capita	0.24	-0.23	0.31	0.07	-0.19	0.11
	(0.08)*	(0.05)**	(0.03)**	(0.47)	(0.08)*	(0.25)
Volatility of GDP	0.70	0.72	0.78	0.88	0.96	0.82
	(0.13)	(0.07)*	(0.09)*	(0.00)***	(0.00)***	(0.00)***
Industry concentration	-0.95	-0.41	-1.51	-0.56	-0.11	-0.90
	(0.11)	(0.48)	(0.02)**	(0.13)	(0.78)	(0.01)***
Firm concentration	0.61	0.75	1.18	0.60	-0.01	0.93
	(0.41)	(0.32)	(0.13)	(0.30)	(0.99)	(0.15)
Intensity of liberalization	-0.18	-0.01	-0.20	0.39	0.03	0.41
	(0.41)	(0.97)	(0.39)	(0.00)***	(0.84)	(0.00)***
Constant	-2.58	0.23	-3.43	-1.02	0.54	-1.56
	(0.05)*	(0.84)	(0.01)**	(0.21)	(0.53)	(0.07)*
Observations	408	408	408	310	310	310
Adjusted R-square	0.622	0.638	0.612	0.629	0.634	0.612

capitalization and the intensity of liberalization seem to affect volatility mostly in developing countries. Indeed, most developed countries in our sample have large stock markets, and almost all were fully liberalized before the start of our study period. Therefore, temporal and within-group variations in financial development, and particularly the intensity of liberalization, are unlikely to explain the changes in volatility.

However, for developing countries the development of capital markets and improvements in the intensity of liberalization are likely to increase the number of investors and the number of local and foreign companies. Consequently, risk is shared among a larger base of investors and firms undertake riskier projects, leading to a higher level of total volatility, particularly its idiosyncratic component. Overall, these findings

suggest that the impact of country-level variables on volatility might vary with the level of economic development.

5.4- How important is the method of privatization?

Our privatization variables are constructed using all privatization sales in a country each year. We do not distinguish between privatization through private sales and privatization through share issue privatizations (SIPs). Both methods of privatization could build up investor confidence. However, privatization sales via the stock market are more transparent (Megginson, 2010) and thus the assessment of the credibility of a privatization policy is easier. Hence, given that the resolution of policy uncertainty is greater via the stock market, we could expect a greater reduction in volatility for SIPs. To disentangle the impact of these methods of privatization, we follow the methodology presented in section III.1 and construct privatization progress measures using all privatization sales, whether via private sales or via the stock market. Then we estimate equation (3) with each of the two variables. The results are shown in Table VII.

In Panel A the progress of privatization through private sales (PS) is negatively and significantly associated with systematic volatility, but not with total and idiosyncratic volatility. However, in Panel B the progress of privatization via SIPs is associated with lower total, systematic, and idiosyncratic volatility. Further, when we include both privatization progress variables in the regression, Panel C, privatization progress through SIPs remains strongly related to volatility, while privatization progress via PS is only weakly related to systematic volatility. These results corroborate the conjecture that the credibility of the privatization policy is more pronounced via the stock market than via

private sales. In Panel D we consider the ratio of SIPs to the total number of privatizations, a measure of the intensity of privatization via the stock market. The results show a weak negative relation between the proportion of SIPs and systematic volatility. This evidence suggests that the share of firms privatized through the stock market does matter less for investors than the progress of privatization.

Overall, the results in Table VII suggest that government privatization policy gains stronger credibility when privatization is carried out through the stock market and

Table 2-VII: The Importance of the Method of Privatization

This table reports values from country level regressions of the logarithm of either total volatility (TVOL), systematic volatility (SVOL) or idiosyncratic volatility (IVOL) on the progress of privatization, further including control variables. All variables are defined in Table I. All regressions include country and year fixed effects. Panel A (Panel B) uses the measure of the progress of privatization constructed with privatization sales through private sales (public offerings); Panel C includes both progress of privatization variables (using private sales and public offerings), and Panel D uses the proportion of public offerings that is, the ratio of firms privatized through public offering to the total number of privatized firms. Standard errors are clustered by country; numbers in parentheses are p-values. *, **, and *** reflect significance at the 10%, 5%, and 1% level, respectively.

	Panel A : Private sales			Panel B : Public offerings			Panel C : Private sales and Public offerings			Panel D : The proportion of public offerings		
	(1) TVOL	(2) SVOL	(3) IVOL	(4) TVOL	(5) SVOL	(6) IVOL	(7) TVOL	(8) SVOL	(9) IVOL	(10) TVOL	(11) SVOL	(12) IVOL
Progress of privatization (PS)	-9.27	-30.97	-7.34				2.96	-15.88	5.67			
	(0.17)	(0.00)***	(0.30)				(0.69)	(0.09)*	(0.47)			
Progress of privatization (PO)				-22.48	-28.47	-22.99	-23.59	-21.39	-25.11			
				(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***			
Proportion of public offerings										-0.02	-0.06	-0.02
										(0.42)	(0.07)*	(0.55)
Investor protection	0.02	0.01	0.02	0.02	0.01	0.01	0.02	0.01	0.01	0.02	0.01	0.02
	(0.00)***	(0.28)	(0.00)***	(0.00)***	(0.30)	(0.00)***	(0.00)***	(0.31)	(0.00)***	(0.00)***	(0.35)	(0.00)***
Stock capitalization/ GDP	0.19	0.36	0.19	0.22	0.36	0.22	0.22	0.37	0.22	0.18	0.28	0.18
	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***
GDP per capita	-0.07	-0.49	-0.03	-0.08	-0.48	-0.04	-0.08	-0.45	-0.04	-0.07	-0.30	-0.03
	(0.32)	(0.00)***	(0.65)	(0.29)	(0.00)***	(0.60)	(0.28)	(0.00)***	(0.58)	(0.31)	(0.00)***	(0.64)
Volatility of GDP	0.70	1.10	0.65	0.66	1.01	0.60	0.67	1.03	0.61	0.73	1.77	0.67
	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***
Industry concentration	-0.22	-0.05	-0.45	-0.27	-0.22	-0.49	-0.28	-0.16	-0.51	-0.25	-0.30	-0.47
	(0.27)	(0.84)	(0.03)**	(0.18)	(0.39)	(0.02)**	(0.16)	(0.54)	(0.01)**	(0.22)	(0.29)	(0.03)**
Firm concentration	0.32	0.68	0.34	0.34	0.74	0.35	0.34	0.73	0.36	0.33	1.28	0.35
	(0.15)	(0.00)***	(0.19)	(0.11)	(0.00)***	(0.15)	(0.10)	(0.00)***	(0.14)	(0.13)	(0.00)***	(0.17)
Intensity of liberalization	0.07	0.16	0.03	0.13	0.12	0.09	0.13	0.14	0.10	0.09	0.03	0.05
	(0.44)	(0.20)	(0.71)	(0.17)	(0.31)	(0.35)	(0.15)	(0.24)	(0.29)	(0.33)	(0.83)	(0.59)
Constant	0.01	2.83	-0.58	-0.30	2.73	-0.70	-0.29	2.50	-0.68	-0.28	0.78	-0.68
	(0.99)	(0.00)***	(0.38)	(0.59)	(0.00)***	(0.23)	(0.60)	(0.00)***	(0.24)	(0.61)	(0.12)	(0.24)
Observations	718	718	718	718	718	718	718	718	718	718	718	718
Adjusted R-square	0.643	0.739	0.615	0.653	0.742	0.625	0.652	0.743	0.624	0.643	0.683	0.614

sustained over time. Further, privatization through private sales is essentially systematic, while privatization through the stock market affects systematic as well as firm-specific volatility.

5.5- Privatization and Volatility: Evidence from Initial Public Offerings (IPO) and Share Issue Privatizations (SIPs)

The literature reviewed in section II.1 suggests that privatization policy risk is (1) country-specific, since it affects the market sentiment on government policy uncertainty, and (2) firm-specific, because partially privatized firms, and in general all privatized firms (SIPs), are likely to be more exposed to government policy reversals than other public firms (IPOs) (Perotti, 1995). Thus, in this section we investigate whether IPO firms and SIP firms experienced similar exposure to political risk.

We perform firm-level regressions. We collect all public firms from Datastream/Worldscope. We identify IPO and SIP firms from SDC databases. To be included in the sample, a firm must have one of the following identification numbers: Datastream identifier, International Securities Identification Number (ISIN), or Security Exchange Daily Official List (SEDOL). The final sample includes 13,456 IPO firms and 416 SIP firms. We construct a dummy variable for IPO (SIP) firms that takes on the value of one if the firm is an IPO (SIP) and zero otherwise. Then we multiply each of these dummy variables by the measure of the progress of privatization. This procedure is useful

Table 2-VIII: Evidence from IPO firms and SIP Firms

This table reports values from firm level regressions of the logarithm of either total volatility (TVOL), systematic volatility (SVOL) or idiosyncratic volatility (IVOL) on progress of privatization variables, further including country-, industry-, and firm-level control variables. All variables are defined in Table I. All regressions include country, industry and year fixed effects. Panel A uses the original progress of privatization variable; Panel B disentangles the impact of the progress of privatization on initial public offering firms (IPO) and share issue privatization firms (SIP). Standard errors are clustered by country; numbers in parentheses are p-values. *, **, and *** reflect significance at the 10%, 5%, and 1% level, respectively.

	Panel A: progress of privatization			Panel B: progress of privatization for IPOs and SIPs		
VARIABLES	(1) TVOL	(2) SVOL	(3) IVOL	(4) TVOL	(5) SVOL	(6) IVOL
Progress of privatization	-6.74	-8.73	-6.63			
	(0.00)***	(0.04)**	(0.00)***			
Progress of privatization (IPO)				-6.88	-7.99	-7.11
				(0.01)***	(0.07)*	(0.00)***
Progress of privatization (SIP)				-8.48	-14.56	-6.98
				(0.00)***	(0.00)***	(0.00)***
SIP dummy				0.01	-0.01	0.01
				(0.80)	(0.77)	(0.75)
Investor protection	0.01	-0.00	0.01	0.01	-0.00	0.01
	(0.13)	(0.58)	(0.05)**	(0.14)	(0.56)	(0.05)*
Stock capitalization/ GDP	0.18	0.17	0.16	0.17	0.17	0.15
	(0.00)***	(0.01)***	(0.00)***	(0.00)***	(0.01)***	(0.00)***
GDP per capita	0.03	-0.05	0.05	0.04	-0.05	0.05
	(0.39)	(0.35)	(0.18)	(0.18)	(0.34)	(0.11)
Volatility of GDP	0.57	1.16	0.41	0.70	1.16	0.53
	(0.00)***	(0.00)***	(0.04)**	(0.00)***	(0.00)***	(0.01)**
Intensity of liberalization	0.08	0.01	0.12	0.06	0.02	0.11
	(0.54)	(0.97)	(0.33)	(0.65)	(0.93)	(0.41)
Product market concentration	0.04	0.07	0.02	0.04	0.07	0.02
	(0.04)**	(0.03)**	(0.24)	(0.03)**	(0.03)**	(0.18)
Total assets	-0.06	0.06	-0.08	-0.06	0.06	-0.08
	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***
PPE/ assets	-0.19	-0.23	-0.19	-0.19	-0.23	-0.19
	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***
RD/ assets	0.26	0.36	0.22	0.21	0.35	0.17
	(0.00)***	(0.02)**	(0.00)***	(0.00)***	(0.02)**	(0.00)***
Cash/assets	0.02	0.04	0.02	0.02	0.04	0.02
	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***
Market-to-book	0.02	0.03	0.01	0.01	0.03	0.01
	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***
Gross profit margin	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***
Leverage	0.32	0.05	0.35	0.33	0.04	0.36
	(0.00)***	(0.09)*	(0.00)***	(0.00)***	(0.11)	(0.00)***
Dividend dummy	-0.27	-0.29	-0.27	-0.27	-0.29	-0.27
	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***
Constant	-2.42	-3.88	-2.65	-2.56	-3.87	-2.71
	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***
Observations	78 058	78 058	78 058	78 058	78 058	78 058
Adjusted R-square	0.398	0.224	0.419	0.400	0.224	0.423

for assessing the impact of the privatization program on the volatility of SIP firms as well as IPO firms.[32] We present the results in Table VIII.

[32] For studies using similar methodologies, the reader is referred to Giroud and Mueller (2011) and Cosset, Somé, and Valéry (2013).

For comparison purposes, in Panel A we show the results using the original progress of privatization measure constructed with all privatization sales (private sales and public offerings). As in Table III for the results at the country level, the progress of privatization is associated with lower total, systematic, and idiosyncratic volatility, although its relation is weaker for systematic volatility (the coefficient on the progress of privatization is significant at the 5% level). Then, in Panel B, we investigate the impact of the progress of privatization on volatility for IPO firms and for SIP firms. For IPO firms, the progress of privatization is negatively and strongly related to total and idiosyncratic volatility, while it is only weakly related to systematic volatility (significance at the 10% level). As expected, this result suggests that political risk (associated with government policy and resolved through the progress of privatization) translates into idiosyncratic risk for IPO firms. For SIP firms, the progress of privatization is associated with lower total, systematic, and idiosyncratic volatility. However, unlike in the case of IPO firms, the magnitude of the coefficient of privatization progress is greater for systematic volatility than for idiosyncratic volatility, suggesting that political risk is mostly associated with the systematic volatility of SIP firms. Unreported p-values for the differences in the coefficients of progress of privatization between IPO and SIP firms are 0.34, 0.04, and 0.94 for total, systematic, and idiosyncratic volatility, respectively. Hence, the results show that, at a 5% significance level, IPO firms contribute relatively less to the reduction in systematic volatility than SIP firms. This result supports the hypothesis that privatized firms are more exposed to government policy reversals than other public firms.

6- Robustness tests

6.1- Endogeneity

In this study, we argue that privatization affects volatility. However, we cannot rule out the possibility that governments will time the decision to privatize so that sales take place during periods of hot markets, to take advantage of favorable investor sentiment and maximize privatization proceeds (Megginson, 2010). Further, the decision to privatize may be governed by unobservable country characteristics that also explain volatility. Hence privatization is likely to be endogenously determined. We have already addressed endogeneity concerns using country fixed effects. To further deal with the issue of endogeneity we perform instrumental variable regressions. We instrument privatization with the lag of the ratio of privatization proceeds to GDP, which is the intensity of privatization, and with a measure of market sentiment (the Chicago Board options exchange market volatility index, or VIX). Both variables qualify as valid instruments that strongly relate to the endogenous variable.[33] By construction, the lagged values of the intensity of privatization are related to the progress of privatization, since the latter variable is obtained by taking the temporal average of the former. The VIX, often referred to as "the market fear gauge" (see Baker and Wurgler, 2007), measures the implied volatility of options on Standard and Poor's 500 stock index. Specifically, it measures the market expectations of stock market volatility over the next month. Since a

[33] We test the validity of our instruments by regressing the residuals of the second stage on the instruments. The results show that the instruments are jointly unrelated to the residuals (further, the robust score test of over-identifying restrictions does not reject the null hypothesis that the instruments are valid). The F-statistic of the first-stage regression is above 57.54 for all regressions (total, systematic, and idiosyncratic volatility), suggesting that the instruments are also strong.

Table 2-IX: Instrumental Variable Regressions

This table addresses the potential endogeneity of the progress of privatization using two instruments: the lag of the intensity of privatization and the market volatility index (VIX), which measures the US market sentiment and thus accounts for the timing of privatization sales. The control variables are defined in Table I. All regressions include country and year fixed-effects. Standard errors are clustered by country; numbers in parentheses are p-values. *, **, and *** reflect significance at the 10%, 5%, and 1% level, respectively.

	(1) TVOL	(2) SVOL	(3) IVOL
Progress of privatization (*instrumented*)	-17.59	-19.16	-16.79
	(0.03)**	(0.00)***	(0.04)**
Investor protection	0.02	0.01	0.01
	(0.00)***	(0.14)	(0.01)**
Stock capitalization/ GDP	0.24	0.27	0.24
	(0.00)***	(0.00)***	(0.00)***
GDP per capita	-0.13	-0.34	-0.10
	(0.08)*	(0.00)***	(0.22)
Volatility of GDP	0.72	1.11	0.64
	(0.00)***	(0.00)***	(0.00)***
Industry concentration	-0.06	0.44	-0.37
	(0.77)	(0.12)	(0.10)
Firm concentration	0.29	1.08	0.36
	(0.31)	(0.00)***	(0.30)
Intensity of liberalization	0.15	0.16	0.09
	(0.10)	(0.22)	(0.34)
Constant	-0.46	0.79	-0.75
	(0.49)	(0.17)	(0.28)
Observations	671	671	671
Adjusted R-square	0.659	0.727	0.633

large number of share privatization issues involve foreign investors, we expect that a government's decision to privatize will be affected by the hotness of some foreign stock markets, particularly those in the United States.[34]

We estimate equation (3) using two-stage least square (2SLS) regressions, with the first stage devoted to the regression of privatization progress on a lag of the intensity of privatization and the current VIX. The fitted values are then used in the second stage along with control variables. The results presented in Table IX support the evidence shown in previous tables. The progress of privatization is associated with lower total, systematic, and idiosyncratic volatility. In comparison with Table III, total and idiosyncratic volatility are now significant at the 5% level, while systematic volatility

[34] We obtain similar results if we take two lags of the intensity of privatization.

remains significant at the 1% level. These results suggest that endogeneity issues do not drive the relation between privatization and volatility.

6.2- Other robustness tests

To ensure that our findings are not affected by the omission of some variables, we consider several control variables. In Table X we present the results for systematic and idiosyncratic volatility only, since total volatility results are similar to those for idiosyncratic volatility. In Panel A we control for market liquidity. Market liquidity could be a proxy for noise trading (see Baker and Wurgler, 2007; Bloomfield, O'Hara, and Saar, 2009). Noise traders usually react in the same direction to the same news. De Long, Shleifer, Summers, and Waldmann (1990) argue that noise traders' misperception about an asset may move its price up or down. Noise traders will drive the asset price up if they are optimistic about the asset and down if they are pessimistic. De Long et al. (1990) claim that a larger proportion of noise traders relative to informed traders could trigger higher systematic volatility. We measure market liquidity with stock market turnover, the ratio of a country's annual trading volume to the total number of shares outstanding. Stock market turnover loads positively for systematic and idiosyncratic volatility; however, its inclusion does not affect the importance of the progress of privatization for volatility.

In Panel B we control for the synchronicity of firms' fundamentals, because the systematic volatility of a market could be high if firms' fundamentals move together. This could be the case if conglomerates represent a larger proportion of listed firms in the country or if ownership is inter-corporate (cross-shareholdings, pyramids), or if related

firms are involved in inter-corporated transactions (Morck et al., 2000). Following these authors, we measure the synchronicity of firm-level fundamentals using the earnings co-movement index. First, we regress firm-level ROA (return on assets) on the weighted average ROA in a country:

$$ROA_{i,j,t} = \alpha_i + \beta_i ROA_{j,t} + e_{it} \quad (4)$$

where *i* represents the firm, *j* the country, and *t* the time period. For each period, the regression is done over a window of five years: the current and the last four years of a firm. Earnings co-movement is obtained by taking the weighted average of firms' R-squares from regression (4):

$$Earnings\ co-movement\ index_j = \sum R_{ij}^2(ROA) \times SST_{ij}(ROA) \Big/ \sum SST_{ij}(ROA) \quad (5)$$

In Panel B the earnings co-movement index is at best weakly (p-value is 0.11) related to systematic volatility. More importantly for our purposes, our previous findings remain unaffected by the inclusion of this variable.

Next, we control for innovation. The literature suggests that innovation may have a heterogeneous impact on firms (see Kogan, Papanikolaou, and Stoffman, 2013). Indeed, innovation activities increase firms' specific risk as they constantly create winners and losers (Bartram et al., 2012). Hence, we would expect innovation to be associated with volatility, particularly its idiosyncratic component. We measure innovation using the country average of research and development to sales (R&D). R&D loads positively with systematic and idiosyncratic volatility. But, importantly for our purposes, the relation between the progress of privatization and volatility remains still.

In Panel D we include all the additional control variables together in the regression. We do not worry about the multicolinearity problem since the objective is to isolate the impact of privatization on volatility. This specification affects the coefficients of some variables; however, it does not invalidate our previous findings.

In Panel E we use an alternative measure for property rights protection. We choose the *good government index* of Morck et al. (2000), which covers elements other than investor protection, such as corruption, contract repudiation, and government

Table 2-X: Further Control Variables

This table reports values from country level regressions of the logarithm of either total volatility (TVOL), systematic volatility (SVOL) or idiosyncratic volatility (IVOL) on the progress of privatization, further including control variables. All variables are defined in Table I. Panel A controls for stock market turnover; Panel B controls for earnings co-movement, Panel C controls for research and development, Panel D includes all these three variables, Panel E controls for the good government index (a measure of property rights); and Panel F controls for all additional variables. Regressions in Panels A through D are OLS with country and year fixed-effects, with standard errors clustered by country. Regressions in Panels E and F use the Fama-McBeth method with Newey-West correction for serial correlation of the year-by-year coefficients. Numbers in parentheses are p-values. *, **, and *** reflect significance at the 10%, 5%, and 1% level, respectively.

	OLS with country fixed-effects								Fama-McBeth regressions			
	Panel A		Panel B		Panel C		Panel D		Panel E		Panel F	
	(1) SVOL	(2) IVOL	(3) SVOL	(4) IVOL	(5) SVOL	(6) IVOL	(7) SVOL	(8) IVOL	(9) SVOL	(10) IVOL	(11) SVOL	(12) IVOL
Progress of privatization	-11.98	-9.24	-11.53	-10.07	-11.17	-8.08	-12.07	-10.00	-11.00	-7.75	-11.02	-7.64
	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.01)***	(0.02)**	(0.00)***	(0.05)**
Investor Protection	0.01	0.02	0.01	0.02	0.01	0.01	0.01	0.02	-0.00	0.01	-0.00	0.01
	(0.22)	(0.00)***	(0.16)	(0.00)***	(0.18)	(0.00)***	(0.06)*	(0.00)***	(0.53)	(0.01)**	(0.83)	(0.01)**
Good government index									-0.02	-0.01	-0.03	-0.02
									(0.03)**	(0.46)	(0.01)***	(0.12)
Stock capitalization/ GDP	0.28	0.20	0.29	0.23	0.26	0.17	0.24	0.19	0.08	-0.07	0.08	-0.00
	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.15)	(0.37)	(0.29)	(1.00)
GDP per capita	-0.37	-0.09	-0.40	-0.14	-0.37	-0.05	-0.37	-0.10	0.00	-0.06	-0.04	-0.09
	(0.00)***	(0.23)	(0.00)***	(0.07)*	(0.00)***	(0.54)	(0.00)***	(0.23)	(0.98)	(0.08)*	(0.39)	(0.12)
Volatility of GDP	0.80	0.56	1.25	0.68	0.88	0.59	1.22	0.66	1.73	0.94	1.51	1.28
	(0.01)**	(0.00)***	(0.00)***	(0.00)***	(0.01)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.01)***	(0.01)***	(0.00)***
Industry concentration	-0.26	-0.49	-0.22	-0.48	0.09	-0.21	0.15	-0.18	0.23	-0.25	0.39	-0.38
	(0.38)	(0.02)**	(0.58)	(0.08)*	(0.75)	(0.31)	(0.74)	(0.55)	(0.64)	(0.00)***	(0.42)	(0.00)***
Firm concentration	1.20	0.26	1.37	0.27	1.11	0.19	1.25	0.20	0.29	0.06	-0.09	-0.43
	(0.00)***	(0.32)	(0.00)***	(0.36)	(0.00)***	(0.43)	(0.00)***	(0.45)	(0.68)	(0.84)	(0.90)	(0.40)
Intensity of liberalization	0.19	0.07	0.13	0.09	0.13	0.24	0.12	0.26	-0.27	-0.05	0.07	0.00
	(0.21)	(0.46)	(0.38)	(0.36)	(0.43)	(0.01)**	(0.48)	(0.01)**	(0.13)	(0.65)	(0.66)	(0.99)
Stock market turnover	0.12	0.06					0.09	0.06			0.13	-0.04
	(0.00)***	(0.03)**					(0.02)**	(0.05)**			(0.08)*	(0.23)
Earnings co-movement index			0.11	0.06			0.14	0.03			0.28	0.17
			(0.11)	(0.27)			(0.05)*	(0.54)			(0.21)	(0.13)
Research and development					0.21	0.11	0.24	0.08			0.03	0.13
					(0.00)***	(0.05)*	(0.00)***	(0.18)			(0.73)	(0.12)
Constant	1.42	0.17	1.65	0.56	1.40	-0.37	1.28	0.09	-1.20	-0.24	-1.18	0.13
	(0.01)**	(0.80)	(0.00)***	(0.40)	(0.01)***	(0.63)	(0.01)**	(0.91)	(0.00)***	(0.29)	(0.00)***	(0.72)
Observations	718	718	666	666	718	718	666	666	612	612	583	583
Adjusted R-square	0.723	0.627	0.735	0.637	0.723	0.630	0.752	0.642	0.323	0.103	0.374	0.158

expropriation. These authors argue that countries with weak property rights protection might have synchronous stock prices. Hence, since higher values of the *good government index* indicate strong protection of property rights, we would expect this index to be associated with lower systematic volatility. The index was discontinued in 1997; therefore, the values of the *good government index* are fixed over the study period. As a consequence, we cannot run fixed-effects regressions. Therefore, we perform Fama-McBeth regressions. Following Jin and Myers (2006), we correct the Fama-McBeth standard errors for serial correlation of the year-by-year regression coefficients. We obtain values of the *good government index* from Jin and Myers (2006). For seven developing countries and one developed country in our sample, this index is not available. The results support the conjecture: the *good government index* is negatively related only to systematic volatility. More importantly, the inclusion of this variable does not affect the impact of the progress of privatization on systematic or on idiosyncratic volatility. In Panel F the inclusion of all additional variables in the Fama-McBeth regression does not change our evidence.

7- Conclusion

In this paper we investigate whether market-oriented reforms such as privatization affect stock return volatility. The literature suggests that privatization reforms that are sustained over time build investor confidence and gradually resolve political risk (i.e., policy reversal risk), thereby reducing volatility. We document that the progress of privatization (i.e., the sustainability of the privatization program) is associated with lower systematic as well as lower idiosyncratic volatility. Further tests suggest that a link

between privatization and volatility is made via political risk resolution. Indeed, we show that the component of political risk that is explained by the progress of privatization is also associated with lower systematic and idiosyncratic volatility.

We also find that the level of economic development influences the privatization-volatility relation. Indeed, it is known that emerging stock markets exhibit higher volatility and greater reaction to political risk than developed markets. Hence, privatization should have a greater impact on volatility in these markets. We document that the drop in volatility associated with the progress of privatization is larger in developing countries. In addition, in developing countries the decline in volatility is explained primarily by its systematic component, while in developed countries the drop generally stems from the idiosyncratic component.

Further, we report that the method of privatization affects the privatization-volatility relation. In fact, the assessment of the credibility of a privatization policy is less difficult and the resolution of policy uncertainty more satisfactory when privatization is carried out via the stock market rather than through the private sector. We find that privatization via the stock market greatly reduces systematic and idiosyncratic volatility, while privatization through the private sector only slightly reduces systematic volatility.

Finally, to assess whether the risk of government policy reversal affects firms unequally, we collect firm-level data and split the sample into privatized and non-privatized public firms. We observe that the progress of privatization generally reduces the volatility of all public firms but that the reduction is greater for privatized firms.

Our findings have several implications. First, by reducing volatility, a sustained privatization program lessens the cost of capital, and thus should increase the level of investment in a country. Further, privatization reduces volatility and hence stock return co-movement, which is generally associated with efficient capital allocation (Wurgler, 2000). Second, from an investor's standpoint, credible privatization reduces the idiosyncratic risk and therefore decreases the number of stocks that an investor might need to hedge against this risk (Campbell et al., 2001). Finally, investor confidence-building through credible share issue privatization and, generally, the reliability of government policies should enhance stock market development. In a nutshell, our findings suggest that governments that develop and implement privatization programs should primarily target investor confidence.

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