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# Internet Appendix

## Capital Allocation by Public and Private Firms

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**Abstract**

This Appendix contains supplemental results for the published article. It is organized as follows: Section A investigates investment policies across listed and unlisted firms using an alternative estimation technique and alternative investment horizon; Sections B and C contain results for alternative samples and measures of growth opportunities, respectively. Section D presents additional evidence on the relation between agency costs and the relative advantage of public firms at allocating capital. Finally, Section E presents results for a sample that includes Eastern European countries.

## A. An Alternative Estimation Technique and Investment Horizon

One potential concern is that the OLS estimates reported in the paper (Table 3) are biased because the regressors are correlated with the error term. Technological shocks, for example, may affect investments and the measure of growth opportunities simultaneously. To investigate whether potential endogeneity problems affect our inferences, we estimate the first differences of our main investment equations with GMM using lags three and four of the regressors as well as year dummies as instruments. This approach is similar to that in Cummins et al. (2006) and Campello and Graham (2007).[1] Results are reported in Table 1A of this appendix. Consistent with our main findings, investment sensitivity to growth opportunities is higher for listed than unlisted firms and the coefficient for listed firms is about twice the magnitude of the coefficient for unlisted firms. This is true both for the baseline and cash flow specifications. These results suggest that the findings reported in section III.A of the paper are not driven by endogeneity.[2]

Additionally, we measure investments over a longer horizon (two years) to address concerns related to the delayed responses. Results are reported in Table 2A. We continue to find that investment sensitivity to growth opportunities are significantly higher for listed than unlisted firms.

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[1] P-values for Hansens' J-statistics for listed firms are 0.81 and 0.82 in the baseline and cash flow specifications, respectively; these values for unlisted firms are 0.46 and 0.22, suggesting that the models are well specified.

[2] We should also note that reverse causality should not be an issue (see, for example, Wurgler (2000) for a discussion). Investments are unlikely to cause contemporaneous changes in sales growth as fixed capital does not become productive until an average of two years after the investment decision has been made. Mayer (1960) and Hall (1977) provide U.S. evidence on gestation lags. For investment to influence sales growth contemporaneously, fixed capital expenditures would have to become productive immediately.

## B. Alternative Samples

In this section, we investigate whether our main results hold in alternative samples. As noted earlier, our matching procedure has the effect of selecting the largest unlisted firms. Table 3A presents results for the full (non-matched) sample. We continue to find that investment sensitivity to growth opportunities is significantly higher for listed than unlisted firms.

Next we examine how unlisted public and private firms compare to listed firms (specifications 2 and 3, Table 3A). We find that investment sensitivity to growth opportunities is always higher for listed firms. The results also suggest that unlisted public and private firms have similar investment sensitivities to growth opportunities (the coefficients are 0.17 vs. 0.19, respectively). Thus, being listed on a major stock exchange seems to be a key factor in explaining investment sensitivity to growth opportunities, supporting the stock-market-benefits argument.

Finally, we investigate whether our findings are due to the survivorship bias in the BvD database. In the version of the database we use, the database provider implemented a rule of excluding the companies that have not filed in the last 4 years. This rule applies both to public and private companies suggesting that the survivorship bias should not affect our results significantly. However, as an additional robustness check, we re-run our analysis using only observations after 2002, the time period that is not affected by the bias, and find that our results are robust (specification 4, Table 3A).

## C. Alternative Measures of Growth Opportunities

In this section, we employ two additional proxies for growth opportunities. First, we consider principal component analysis to capture information related to firm growth opportunities conveyed by its fundamentals. The potential advantage of this measure is that,

unlike the predicted market-to-book, this measure doesn't rely on market-to-book, which is only available for listed firms. We use the first component extracted from contemporaneous and lagged values of earnings, sales growth, cash flows, and industry sales growth as well as lagged values of capital investment and industry capital investment. To the extent that the first component captures information related to growth opportunities, we continue to find that investment sensitivity to growth opportunities is higher for listed than unlisted firms (specification 1, Table 4A).

Second, we consider the median industry market-to-book in a country as a measure of growth opportunities.[3] Our results are qualitatively similar to those obtained using sales growth (specification 2, Table 4A).

**D. Shareholder Rights, Agency Costs and the Relative Efficiency of Capital Allocation**

In this section, we consider the rule of law measure from the Political Risk Services International Country Risk Guide to proxy for shareholder rights. Results are presented in Table 5A. There is some evidence that the economic advantage of public firms varies with institutional settings. Using sales growth, we find that listed firms have higher investment sensitivity to growth opportunities in countries with strong shareholder rights than in countries with weak shareholder rights. For example, the coefficient on sales growth for listed firms is 0.33 ($p = 0.000$, in the baseline specification) in countries with strong shareholder rights; it is only 0.26 ($p = 0.000$) in countries with weak shareholder rights and the difference is statistically significant at the 10% level. The investment sensitivity of unlisted firms doesn't vary with shareholder rights. Further, in countries with weak shareholder rights, investment sensitivity to growth opportunities is not

[3] We compute median market-to-book for all firms within the same industry, country and year.

significantly different across listed and unlisted firms when predicted MB is used (the cash flow specification). By contrast, in countries with strong shareholder rights, investment sensitivity to growth opportunities is always higher for listed than unlisted firms. These results also suggest that public firms with a high degree of agency costs are less likely to have an advantage over private firms at allocating capital.

We also show, using firm level proxies, that the relative advantage of public firms depends on the degree of agency costs. There are a number of ways a public firm can overcome the limitations of its own institutional environment with regards to governance/agency concerns and thus potentially improve the alignment of capital investment and growth opportunities. First, we investigate the impact of leverage on the relative advantage listed firms have at allocating capital. Jensen (1986) is among the first to suggest that debt may serve as a disciplinarian mechanism, thus reducing costs associated with managerial discretion and increasing the relative advantage of listed firms. We compare the investment policies of listed firms with leverage above the median to the investment policies of listed firms with leverage below the median. Results are presented in Table 6A.

We find evidence that leverage impacts the relative advantage listed firms have at allocating capital, consistent with the trade-offs between the costs associated with ownership dispersion and the benefits associated with being part of the public equity markets. Specifically, investment sensitivity to growth opportunities is always higher for listed firms with leverage above/equal to the median than for listed firms with leverage below the median. Interestingly, there is also some evidence that investment sensitivity to growth opportunities of low-leverage listed firms does not differ from investment sensitivity to growth opportunities of unlisted firms.

Specifically, the coefficients on predicted MB are 0.17 and 0.19 for low-leverage listed firms and unlisted firms, respectively, and the difference is statistically insignificant.

We also investigate the impact of dividend policy on the relative advantage listed firms have at allocating capital. To this end, we compare the investment policies of listed firms that pay dividends to the investment policies of listed firms that do not pay dividends. Listed firms that pay dividends may have relatively low agency problems (e.g., Easterbrook, 1984). We find some evidence that investment sensitivity to growth opportunities is higher for listed firms that pay dividends than for listed firms that do not pay dividends. For example, in our cash flow specification, the coefficients on sales growth are 0.35 and 0.24 for listed firms that pay dividends and for listed firms that do not pay dividends, respectively, and the difference is significant at the 1% level (Table 7A). Further, the coefficients on predicted MB across listed firms that do not pay dividends and unlisted firms are statically insignificant in the cash flow specification.

Taken together, the results in this section suggest that public firms with high levels of agency problems are less likely to have an advantage over private firms at allocating capital.

**E. Eastern European Countries**

Given the low quality of the accounting data in Eastern Europe, we exclude these countries from our previous tests.[4] However, including Eastern European countries may provide some advantages due to increased variation in the quality of countries' institutions. In this section, we consider an alternative sample that includes Eastern European countries. We follow the sample

[4] For example, according to a Price Waterhouse Coopers publication that presents statistics on accounting quality, Russia is rated 81, Czech Republic 77 and U.K 45, (low numbers reflect better accounting quality), there is quite a significant gap between the first two countries and the UK.

selection procedure described in the paper in Section II and rely on the matched sample. Table 8A presents the results. They are qualitatively similar to those reported in Table 3 in the paper.

Next we investigate the relation between the quality of countries' institutions and the relative advantage of public firms. We continue to find that the relative advantage of public firms varies with institutional settings. Specifically, we find that listed firms exhibit higher investment sensitivity to growth opportunities than unlisted firms only in countries with developed stock markets (Table 9A). Additionally, we now find that the relative investment sensitivity is affected by variation in the anti-self-dealing index (Table 10A). Specifically, listed firms exhibit higher investment sensitivity to growth opportunities than unlisted firms only in countries with strong shareholder rights.

**References (not cited in the paper):**

Easterbrook, F. "Two Agency-Cost Explanations of Dividends." *American Economic Review*, 74 (1984), 650-659.

Hall, R. "Investment, Interest Rates, and the Effects of Stabilization Policies." *Brookings Papers on Economic Activity*, 1 (1977), 61-103.

Mayer, T. "Plant and Equipment Lead Times." *Journal of Business*, 33 (1960), 127-132.

**Table 1A. Investment Policies across Listed and Unlisted Firms: Alternative Estimation Technique**

The table presents an alternative estimation technique for the OLS regressions presented in Table 3. Specifically, this table presents GMM estimation for the matched sample, and our instruments are lags three and four of the independent variables and year dummies. Details of the matching procedure are provided in the text. The data are from the 2007 version of Amadeus. The sample includes non-financial firms from Western European countries over the 1996-2006 period. The dependent variable is *Investment*, computed as the one-year change in the value of net tangible assets plus depreciation divided by beginning-of-period net tangible assets. *Sales Growth* is computed as the one-year change in sales divided by beginning-of-period sales. *Cash Flow* is net income plus depreciation divided by lagged tangible assets. We estimate coefficients using first differences. The row headed *Difference* contains the difference between the listed and unlisted coefficients. We test for the null hypothesis that the coefficients are equal across the two models using the Wald test. Robust standard errors are in parentheses. ***, **,* denote statistical significance at the 1%, 5% and 10% levels, respectively.

| | Sales Growth | Cash Flow | N | Adj. $R^2$ |
|---|---|---|---|---|
| 1. Baseline specification | | | | |
| Listed | 0.59*** | | 5,000 | 0.04 |
| | (0.08) | | | |
| Unlisted | 0.26*** | | 3,970 | 0.04 |
| | (0.08) | | | |
| *Difference* | *0.33*** | | | |
| 2. Cash flow specification | | | | |
| Listed | 0.59*** | 0.03 | 4,994 | 0.05 |
| | (0.09) | (0.08) | | |
| Unlisted | 0.29*** | 0.04 | 3,959 | 0.05 |
| | (0.09) | (0.12) | | |
| *Difference* | *0.30*** | *-0.01* | | |

**Table 2A. Investment Policies across Listed and Unlisted Firms: Alternative investment horizon**

The table presents results of OLS regressions for listed and matched unlisted firms. Details of the matching procedure are provided in the text. The data are from the 2007 version of Amadeus. The sample includes non-financial firms from Western European countries over the 1996-2006 period. The dependent variable is Investment, computed as the two year average of annual investment. Annual investment is the one-year change in the value of the net tangible assets plus depreciation divided by beginning-of-period net tangible assets. *Sales Growth* is computed as the one-year change in sales divided by beginning-of-period sales. *Cash Flow* is net income plus depreciation divided by lagged tangible assets. The row headed *Difference* contains the difference between the listed and unlisted coefficients. We test for the null hypothesis that the coefficients are equal across the two models using seemingly unrelated estimation. Each regression includes firm and year dummies (not reported). The estimation procedures correct standard errors for heteroskedasticity and serial correlation. Robust standard errors are in parentheses. ***, **,* denote statistical significance at the 1%, 5% and 10% levels, respectively.

| | Sales Growth | Cash Flow | N | Adj. $R^2$ |
|---|---|---|---|---|
| 1. Baseline specification | | | | |
| Listed | 0.18*** | | 9,587 | 0.44 |
| | (0.02) | | | |
| Unlisted | 0.08*** | | 8,883 | 0.36 |
| | (0.02) | | | |
| *Difference* | *0.10*** | | | |
| 2. Cash flow specification | | | | |
| Listed | 0.16*** | 0.04*** | 9,575 | 0.45 |
| | (0.02) | (0.01) | | |
| Unlisted | 0.07*** | 0.03*** | 8,864 | 0.37 |
| | (0.02) | (0.01) | | |
| *Difference* | *0.09*** | *0.01* | | |

**Table 3A. Investment Policies across Listed and Unlisted Firms: Alternative samples**

This table presents results of OLS regressions for the full (non-matched) sample (specification 1), several sub-sets of the full sample (specifications 2-3), and the matched sample including only years after 2002 (specification 4). Details of the matching procedure are provided in the text. The data are from the 2007 version of Amadeus. The sample includes non-financial firms from Western European countries over the 1996-2006 period. The dependent variable is *Investment*, computed as the one-year change in the value of net tangible assets plus depreciation divided by beginning-of-period net tangible assets. *Sales Growth* is computed as the one-year change in sales divided by beginning-of-period sales. *Cash Flow* is net income plus depreciation divided by lagged tangible assets. The row headed *Difference* contains the difference between the listed and unlisted coefficients. We test for the null hypothesis that the coefficients are equal across the two models using seemingly unrelated estimation. Robust standard errors are in parentheses. ***, **,* denote statistical significance at the 1%, 5% and 10% levels, respectively.

| | Baseline specifications | | Cash flow specifications | | |
|---|---|---|---|---|---|
| | Sales Growth | N | Sales Growth | Cash Flow | N |
| 1. All | | | | | |
| Listed | 0.31*** | 13,446 | 0.28*** | 0.04*** | 13,419 |
| | (0.02) | | (0.02) | (0.01) | |
| Unlisted | 0.18*** | 292,218 | 0.17*** | 0.04*** | 291,544 |
| | (0.00) | | (0.00) | (0.00) | |
| *Difference* | *0.13*** | | *0.11*** | *0.00* | |
| 2. Listed v. public unlisted | | | | | |
| Listed | 0.31*** | 13,446 | 0.28*** | 0.04*** | 13,419 |
| | (0.02) | | (0.02) | (0.01) | |
| Public unlisted | 0.17*** | 109,412 | 0.16*** | 0.05*** | 109,168 |
| | (0.01) | | (0.01) | (0.01) | |
| *Difference* | *0.14*** | | *0.12*** | *-0.01* | |
| 3. Listed v. private | | | | | |
| Listed | 0.31*** | 13,446 | 0.28*** | 0.04*** | 13,419 |
| | (0.02) | | (0.02) | (0.01) | |
| Private | 0.19*** | 182,806 | 0.17*** | 0.03*** | 182,376 |
| | (0.01) | | (0.02) | (0.01) | |
| *Difference* | *0.12*** | | *0.11*** | *0.01* | |
| 4. Post-2002 | | | | | |
| Listed | 0.25*** | 4,692 | 0.22*** | 0.04*** | 4,686 |
| | (0.04) | | (0.04) | (0.01) | |
| Unlisted | 0.11*** | 4,004 | 0.11*** | 0.016*** | 3,988 |
| | (0.04) | | (0.04) | (0.01) | |
| *Difference* | *0.14*** | | *0.11*** | *0.12*** | |

**Table 4A. Investment Policies across Listed and Unlisted Firms: Alternative Measures of Growth Opportunities**

The table presents results of OLS regressions for listed and matched unlisted firms for two alternative measures of growth opportunities. Details of the matching procedure are provided in the text. The financial data are from the 2007 version of Amadeus. The sample includes non-financial firms from Western European countries over the 1996-2006 period. We first proxy for growth opportunities using principal components analysis (specification 1). Specifically, we use the first component extracted from contemporaneous and lagged values of earnings, sales growth, cash flows, and industry sales growth as well as lagged values of capital investment and industry capital investment. We also use industry market to book ratio computed as the median value for each industry-country-year (specification 2). The dependent variable is *Investment*, computed as the one-year change in the value of net tangible assets plus depreciation divided by beginning-of-period net tangible assets. *Cash Flow* is net income plus depreciation divided by lagged tangible assets. The row headed *Difference* contains the difference between the listed and unlisted coefficients. We test for the null hypothesis that the coefficients are equal across each of the two models using the seemingly unrelated estimation. Each regression includes firm and year dummies (not reported). The estimation procedures correct standard errors for heteroskedasticity and serial correlation. Robust standard errors are in parentheses. ***, **,* denote statistical significance at the 1%, 5% and 10% levels, respectively.

| | Baseline specifications | | Cash flow specifications | | |
|---|---|---|---|---|---|
| | Growth Opport. | N | Growth Opport. | Cash Flow | N |
| 1. Principal Components | | | | | |
| Listed | 0.07*** | 9,713 | 0.06*** | 0.04*** | 9,713 |
| | (0.00) | | (0.01) | (0.01) | |
| Unlisted | 0.05*** | 8,626 | 0.04*** | 0.01** | 8,626 |
| | (0.01) | | (0.01) | (0.01) | |
| *Difference* | *0.02*** | | *0.02*** | *0.03*** | |
| 2. Median Ind. MB | | | | | |
| Listed | 0.04*** | 8,586 | 0.03** | 0.04*** | 8,573 |
| | (0.01) | | (0.01) | (0.01) | |
| Unlisted Public | 0.01 | 7,107 | 0.01 | 0.03*** | 7,087 |
| | (0.01) | | (0.01) | (0.01) | |
| *Difference* | *0.03** | | *0.02* | *0.01* | |

**Table 5A. Rule of Law and Investment Policies across Listed and Unlisted Firms**

The table presents results of OLS regressions for listed and matched unlisted firms by level of shareholder rights. Details of the matching procedure are provided in the text. The financial data are from the 2007 version of Amadeus. The sample includes non-financial firms from Western European countries over the 1996-2006 period. We present results for countries with the rule-of-law index above the median on the left, and the rule-of- law below the median on the right. The rule-of-law index is from Political Risk Services International Country Risk Guide. The dependent variable is *Investment*, computed as the one-year change in the value of net tangible assets plus depreciation divided by beginning-of-period net tangible assets. We proxy for growth opportunities with *Sales Growth*, computed as the one-year change in sales divided by beginning-of-period sales, and *Estimated MB,* calculated using the projection of market-to-book on a number of firm- and industry-level variables capturing the firm's growth opportunities. *Cash Flow* is net income plus depreciation divided by lagged tangible assets. The row headed *Difference* contains the difference between the listed and unlisted coefficients, and the column headed difference contains the difference between the growth opportunity coefficients across high and low levels of shareholder rights. We test for the null hypothesis that the coefficients are equal across each of the two models using the seemingly unrelated estimation. Each regression includes firm and year dummies (not reported). The estimation procedures correct standard errors for heteroskedasticity and serial correlation. Robust standard errors are in parentheses. ***, **,* denote statistical significance at the 1%, 5% and 10% levels, respectively.

Panel A. Sales growth as a measure of growth opportunities

| | Rule of law above median | | | | Rule of law below median | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Sales Growth | Cash Flow | N | Adj. $R^2$ | Sales Growth | Cash Flow | N | Adj. $R^2$ | *Difference in sales growth coeff.* |
| 1. Baseline specification | | | | | | | | | |
| Listed | 0.33*** | | 5,864 | 0.39 | 0.26*** | | 5,624 | 0.36 | *0.07** |
| | (0.03) | | | | (0.03) | | | | |
| Unlisted | 0.17*** | | 6,153 | 0.35 | 0.13*** | | 4,728 | 0.34 | *0.04* |
| | (0.02) | | | | (0.03) | | | | |
| *Difference* | *0.16**** | | | | *0.13**** | | | | |
| 2. Cash flow specification | | | | | | | | | |
| Listed | 0.31*** | 0.04*** | 5,854 | 0.40 | 0.24*** | 0.04*** | 5,621 | 0.37 | *0.07** |
| | (0.03) | (0.01) | | | (0.03) | (0.01) | | | |
| Unlisted | 0.16*** | 0.02*** | 6,136 | 0.36 | 0.13*** | 0.03*** | 4,718 | 0.35 | *0.03* |
| | (0.02) | (0.01) | | | (0.03) | (0.01) | | | |
| *Difference* | *0.15**** | *0.02* | | | *0.11**** | *0.01* | | | |

Panel B. Estimated MB as a measure of growth opportunities

| | Rule of law above median | | | | Rule of law below median | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Est. MB | Cash Flow | N | Adj. $R^2$ | Est. MB | Cash Flow | N | Adj. $R^2$ | *Diff. in est. MB coeff.* |
| 1. Baseline specification | | | | | | | | | |
| Listed | 0.31*** | | 4,500 | 0.42 | 0.31*** | | 5,213 | 0.37 | *0.00* |
| | (0.02) | | | | (0.03) | | | | |
| Unlisted | 0.21*** | | 4,510 | 0.37 | 0.23** | | 4,116 | 0.34 | *-0.02* |
| | (0.03) | | | | (0.03) | | | | |
| *Difference* | *0.10**** | | | | *0.08*** | | | | |
| 2. Cash flow specification | | | | | | | | | |
| Listed | 0.26*** | 0.03** | 4,500 | 0.42 | 0.25*** | 0.03** | 5,213 | 0.37 | *0.01* |
| | (0.03) | (0.01) | | | (0.04) | (0.01) | | | |
| Unlisted | 0.18*** | 0.01 | 4,510 | 0.37 | 0.18*** | 0.02*** | 4,116 | 0.35 | *0.00* |
| | (0.03) | (0.01) | | | (0.04) | (0.01) | | | |
| *Difference* | *0.08** | *0.02* | | | *0.07* | *0.01* | | | |

**Table 6A. Leverage and Investment Policies across Listed and Unlisted Firms**

The table presents results of OLS regressions for listed and matched unlisted firms by level of debt. Details of the matching procedure are provided in the text. The financial data are from the 2007 version of Amadeus. The sample includes non-financial firms from Western European countries over the 1996-2006 period. We present results for listed firms with leverage above the median on the left, and leverage below the median on the right. Leverage is the sum of short and long term debt divided by the sum of total debt and equity. The dependent variable is *Investment*, computed as the one-year change in the value of net tangible assets plus depreciation divided by beginning-of-period net tangible assets. We proxy for growth opportunities with *Sales Growth*, computed as the one-year change in sales divided by beginning-of-period sales, and *Estimated MB,* calculated using the projection of market-to-book on a number of firm- and industry-level variables capturing the firm's growth opportunities. *Cash Flow* is net income plus depreciation divided by lagged tangible assets. The row headed *Difference* contains the difference between the listed and unlisted coefficients, and the column headed difference contains the difference between the growth opportunity coefficients across high and low levels of leverage. We test for the null hypothesis that the coefficients are equal across each of the two models using the seemingly unrelated estimation. Each regression includes firm and year dummies (not reported). The estimation procedures correct standard errors for heteroskedasticity and serial correlation. Robust standard errors are in parentheses. ***, **,* denote statistical significance at the 1%, 5% and 10% levels, respectively.

Panel A. Sales growth as a measure of growth opportunities

| | Listed firm with leverage above median | | | | Listed firms with leverage below median | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Sales Growth | Cash Flow | N | Adj. $R^2$ | Sales Growth | Cash Flow | N | Adj. $R^2$ | *Difference in sales growth coeff.* |
| 1. Baseline specification | | | | | | | | | |
| Listed | 0.36*** | | 5,611 | 0.33 | 0.29*** | | 5,611 | 0.42 | *0.07** |
| | (0.03) | | | | (0.03) | | | | |
| Unlisted | 0.16*** | | 10,881 | 0.33 | 0.16*** | | 10,881 | 0.33 | *n/a* |
| | (0.02) | | | | (0.02) | | | | |
| *Difference* | *0.20**** | | | | *0.13**** | | | | |
| 2. Cash flow specification | | | | | | | | | |
| Listed | 0.34*** | 0.03** | 5,608 | 0.33 | 0.26*** | 0.04*** | 5,602 | 0.44 | *0.08*** |
| | (0.03) | (0.01) | | | (0.03) | (0.01) | | | |
| Unlisted | 0.16*** | 0.02*** | 10,845 | 0.34 | 0.16*** | 0.02*** | 10,845 | 0.34 | *n/a* |
| | (0.02) | (0.00) | | | (0.02) | (0.00) | | | |
| *Difference* | *0.18**** | *0.01* | | | *0.10**** | *0.02** | | | |

Panel B. Estimated MB as a measure of growth opportunities

| | Listed firm with leverage above median | | | | Listed firms with leverage below median | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Est. MB | Cash Flow | N | Adj. $R^2$ | Est. MB | Cash Flow | N | Adj. $R^2$ | *Diff. in est. MB coeff.* |
| 1. Baseline specification | | | | | | | | | |
| Listed | 0.43*** | | 4,835 | 0.34 | 0.27*** | | 4,686 | 0.45 | *0.16**** |
| | (0.03) | | | | (0.03) | | | | |
| Unlisted | 0.21*** | | 8,626 | 0.36 | 0.21*** | | 8,626 | 0.36 | *n/a* |
| | (0.02) | | | | (0.02) | | | | |
| *Difference* | *0.22**** | | | | *0.06*** | | | | |
| 2. Cash flow specification | | | | | | | | | |
| Listed | 0.42*** | 0.00 | 4,835 | 0.34 | 0.17*** | 0.05*** | 4,686 | 0.47 | *0.25**** |
| | (0.03) | (0.01) | | | (0.03) | (0.01) | | | |
| Unlisted | 0.19*** | 0.01*** | 8,626 | 0.36 | 0.19*** | 0.01*** | 8,626 | 0.36 | *n/a* |
| | (0.02) | (0.01) | | | (0.02) | (0.01) | | | |
| *Difference* | *0.23**** | *-0.01* | | | *-0.02* | *0.04**** | | | |

**Table 7A. Dividend Payout and Investment Policies across Listed and Unlisted Firms**

The table presents results of OLS regressions for listed and matched unlisted firms by dividend policy. Details of the matching procedure are provided in the text. The financial data are from the 2007 version of Amadeus. The sample includes non-financial firms from Western European countries over the 1996-2006 period. We present results for listed firms that pay dividends on the left, and firms that don't pay dividends on the right. We obtain dividend data from Datastream. The dependent variable is *Investment*, computed as the one-year change in the value of net tangible assets plus depreciation divided by beginning-of-period net tangible assets. We proxy for growth opportunities with *Sales Growth*, computed as the one-year change in sales divided by beginning-of-period sales, and *Estimated MB,* calculated using the projection of market-to-book on a number of firm- and industry-level variables capturing the firm's growth opportunities. *Cash Flow* is net income plus depreciation divided by lagged tangible assets. The row headed *Difference* contains the difference between the listed and unlisted coefficients, and the column headed difference contains the difference between the growth opportunity coefficients across firms that pay dividends and firms that don't. We test for the null hypothesis that the coefficients are equal across each of the two models using the seemingly unrelated estimation. Each regression includes firm and year dummies (not reported). The estimation procedures correct standard errors for heteroskedasticity and serial correlation. Robust standard errors are in parentheses. ***, **,* denote statistical significance at the 1%, 5% and 10% levels, respectively.

Panel A. Sales growth as a measure of growth opportunities

| | Listed firms that pay dividends | | | | Listed firms that do not pay dividends | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Sales Growth | Cash Flow | N | Adj. $R^2$ | Sales Growth | Cash Flow | N | Adj. $R^2$ | *Difference in sales growth coeff.* |
| 1. Baseline specification | | | | | | | | | |
| Listed | 0.38*** | | 7,155 | 0.39 | 0.25*** | | 2,298 | 0.37 | *0.13**** |
| | (0.03) | | | | (0.04) | | | | |
| Unlisted | 0.16*** | | 10,881 | 0.33 | 0.16*** | | 10,881 | 0.33 | *n/a* |
| | (0.02) | | | | (0.02) | | | | |
| *Difference* | *0.22**** | | | | *0.09*** | | | | |
| 2. Cash flow specification | | | | | | | | | |
| Listed | 0.35*** | 0.04*** | 7,151 | 0.40 | 0.24*** | 0.01 | 2,291 | 0.38 | *0.11*** |
| | (0.03) | (0.01) | | | (0.04) | (0.02) | | | |
| Unlisted | 0.16*** | 0.02*** | 10,845 | 0.34 | 0.16*** | 0.02*** | 10,845 | 0.34 | *n/a* |
| | (0.02) | (0.00) | | | (0.02) | (0.00) | | | |
| *Difference* | *0.19**** | *0.02* | | | *0.08*** | *-0.01* | | | |

Panel B. Estimated MB as a measure of growth opportunities

| | Listed firms that pay dividends | | | | Listed firms that do not pay dividends | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Est. MB | Cash Flow | N | Adj. $R^2$ | Est. MB | Cash Flow | N | Adj. $R^2$ | *Diff. in est. MB coeff.* |
| 1. Baseline specification | | | | | | | | | |
| Listed | 0.34*** | | 6,178 | 0.41 | 0.28*** | | 1,862 | 0.43 | *0.06* |
| | (0.03) | | | | (0.05) | | | | |
| Unlisted | 0.21*** | | 8,626 | 0.36 | 0.21*** | | 8,626 | 0.36 | *n/a* |
| | (0.02) | | | | (0.02) | | | | |
| *Difference* | *0.13**** | | | | *0.07** | | | | |
| 2. Cash flow specification | | | | | | | | | |
| Listed | 0.29*** | 0.03*** | 6,178 | 0.41 | 0.24*** | 0.03 | 1,862 | 0.43 | *0.05* |
| | (0.03) | (0.01) | | | (0.06) | (0.02) | | | |
| Unlisted | 0.19*** | 0.01*** | 8,626 | 0.36 | 0.19*** | 0.01*** | 8,626 | 0.36 | *n/a* |
| | (0.02) | (0.01) | | | (0.02) | (0.01) | | | |
| *Difference* | *0.10**** | *0.02*** | | | *0.05* | *0.02* | | | |

**Table 8A . Investment Policies across Listed and Unlisted Firms: Including Eastern European Countries**

The table presents results of OLS regressions for listed and matched unlisted firms. Details of the matching procedure are provided in the text. The data are from the 2007 version of Amadeus. The sample includes non-financial firms from Eastern and Western European countries over the 1996-2006 period. The dependent variable is *Investment*, computed as the one-year change in the value of net tangible assets plus depreciation divided by beginning-of-period net tangible assets. *Sales Growth* is computed as the one-year change in sales divided by beginning-of-period sales. *Cash Flow* is net income plus depreciation divided by lagged tangible assets. The row headed *Difference* contains the difference between the listed and unlisted coefficients. We test for the null hypothesis that the coefficients are equal across the two models using seemingly unrelated estimation. Each regression includes firm and year dummies (not reported). The estimation procedures correct standard errors for heteroskedasticity and serial correlation. Robust standard errors are in parentheses. ***, **,* denote statistical significance at the 1%, 5% and 10% levels, respectively.

| | Sales Growth | Cash Flow | N | Adj. $R^2$ |
|---|---|---|---|---|
| 1. Baseline specification | | | | |
| Listed | 0.27*** | | 13,275 | 0.36 |
| | (0.02) | | | |
| Unlisted | 0.16*** | | 12,427 | 0.33 |
| | (0.02) | | | |
| *Difference* | *0.11*** | | | |
| 2. Cash flow specification | | | | |
| Listed | 0.25*** | 0.04*** | 13,256 | 0.36 |
| | (0.02) | (0.01) | | |
| Unlisted | 0.16*** | 0.02*** | 12,395 | 0.34 |
| | (0.02) | (0.00) | | |
| *Difference* | *0.09*** | *0.02*** | | |

**Table 9A. Stock Market Development and Investment Policies across Listed and Unlisted Firms: Including Eastern European Countries**

The table presents results of OLS regressions for listed and matched unlisted firms by level of stock market development. Details of the matching procedure are provided in the text. The financial data are from the 2007 version of Amadeus. The sample includes non-financial firms from Eastern and Western European countries over the 1996-2006 period. We present results for countries with stock market development index above the median on the left, and stock market development index below the median on the right. The stock market development index is constructed from World Bank data following Dermiguc-Kunt and Levine (1996). The dependent variable is *Investment*, computed as the one-year change in the value of the net tangible assets plus depreciation divided by beginning-of-period net tangible assets. We proxy for growth opportunities with *Sales Growth*, computed as the one-year change in sales divided by beginning-of-period sales. *Cash Flow* is net income plus depreciation divided by lagged tangible assets. The row headed *Difference* contains the difference between the listed and unlisted coefficients, and the column headed difference contains the difference between the growth opportunity coefficients across high and low levels of stock market development. We test for the null hypothesis that the coefficients are equal across each of the two models using the seemingly unrelated estimation. Each regression includes firm and year dummies (not reported). The estimation procedures correct standard errors for heteroskedasticity and serial correlation. Robust standard errors are in parentheses. ***, **,* denote statistical significance at the 1%, 5% and 10% levels, respectively.

| | Stock mkt. dev. above median | | | | Stock mkt. dev. below median | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Sales Growth | Cash Flow | N | Adj. $R^2$ | Sales Growth | Cash Flow | N | Adj. $R^2$ | *Difference in sales growth coeff.* |
| 1. Baseline specification | | | | | | | | | |
| Listed | 0.32*** | | 11,390 | 0.36 | 0.08** | | 1,885 | 0.17 | *0.24**** |
| | (0.02) | | | | (0.04) | | | | |
| Unlisted | 0.16*** | | 10,795 | 0.33 | 0.17*** | | 1,632 | 0.32 | *-0.01* |
| | (0.02) | | | | (0.04) | | | | |
| *Difference* | *0.16**** | | | | *-0.09** | | | | |
| 2. Cash flow specification | | | | | | | | | |
| Listed | 0.29*** | 0.04*** | 11,377 | 0.37 | 0.06* | 0.10* | 1,879 | 0.19 | *0.23**** |
| | (0.02) | (0.01) | | | (0.04) | (0.06) | | | |
| Unlisted | 0.16*** | 0.02*** | 10,768 | 0.34 | 0.15*** | 0.16*** | 1,627 | 0.35 | *0.01* |
| | (0.02) | (0.00) | | | (0.04) | (0.04) | | | |
| *Difference* | *0.13**** | *0.02*** | | | *-0.09** | *-0.06* | | | |

**Table 10A. Anti-Self-Dealing Index and Investment Policies across Listed and Unlisted Firms: Including Eastern European Countries**

The table presents results of OLS regressions for listed and matched unlisted firms by level of shareholder rights. Details of the matching procedure are provided in the text. The financial data are from the 2007 version of Amadeus. The sample includes non-financial firms from Eastern and Western European countries over the 1996-2006 period. We present results for countries with the anti-self-dealing index above the median on the left, and anti-self-dealing index below the median on the right. The anti-self-dealing index is from Djankov et al. (2006). The dependent variable is *Investment*, computed as the one-year change in the value of the net tangible assets plus depreciation divided by beginning-of-period net tangible assets. We proxy for growth opportunities with *Sales Growth*, computed as the one-year change in sales divided by beginning-of-period sales. *Cash Flow* is net income plus depreciation divided by lagged tangible assets. The row headed *Difference* contains the difference between the listed and unlisted coefficients, and the column headed difference contains the difference between the growth opportunity coefficients across high and low levels of the anti-self-dealing index. We test for the null hypothesis that the coefficients are equal across each of the two models using the seemingly unrelated estimation. Each regression includes firm and year dummies (not reported). The estimation procedures correct standard errors for heteroskedasticity and serial correlation. Robust standard errors are in parentheses. ***, **,* denote statistical significance at the 1%, 5% and 10% levels, respectively.

| | Anti-self-dealing above median | | | | Anti-self-dealing below median | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Sales Growth | Cash Flow | N | Adj. $R^2$ | Sales Growth | Cash Flow | N | Adj. $R^2$ | *Difference in sales growth coeff.* |
| 1. Baseline specification | | | | | | | | | |
| Listed | 0.32*** | | 7,966 | 0.39 | 0.20*** | | 4,967 | 0.31 | *0.12**** |
| | (0.03) | | | | (0.03) | | | | |
| Unlisted | 0.17*** | | 8,024 | 0.34 | 0.15*** | | 4,101 | 0.31 | *0.02* |
| | (0.02) | | | | (0.02) | | | | |
| *Difference* | *0.15**** | | | | *0.05* | | | | |
| 2. Cash flow specification | | | | | | | | | |
| Listed | 0.29*** | 0.05*** | 7,953 | 0.40 | 0.19*** | 0.03*** | 4,961 | 0.31 | *0.10**** |
| | (0.02) | (0.01) | | | (0.03) | (0.01) | | | |
| Unlisted | 0.16*** | 0.02*** | 8,004 | 0.35 | 0.15*** | 0.03*** | 4,089 | 0.32 | *0.01* |
| | (0.02) | (0.01) | | | (0.02) | (0.01) | | | |
| *Difference* | *0.13**** | *0.03*** | | | *0.04* | *0.00* | | | |