Erratum: "Measurement Error and the Relationship between Investment and q"

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The estimates reported in Tables 1 through 9 in our article "Measurement Error and the Relationship between Investment and q" published in the *Journal of Political Economy* (vol. 8 [October 2000]: 1027-1057) are incorrect. This error is reported in Ağca and Mozumdar (2010). The error was due to merging Compustat data on net income into the data set in reverse order on a firm level basis. The figures in this erratum have been obtained by inserting the correctly sorted values for net income into our original data set. The new estimates are similar to the old estimates because the cross sectional variation in net income, which was unaffected by sorting, is much larger than the within firm variation. We are grateful to Professor Ağca for discovering this data error. The correct estimates are in Tables 1 through 9 below, and the basic conclusions of the paper are unchanged.

Tables 1 through 7 report estimates and diagnostic tests from cross-sectional firm-level regressions of the ratio of investment to capital on Tobin's q, the ratio of cash flow to capital, a dummy for whether the firm has a bond rating, and the interaction of this dummy with cash flow. Estimation is done with ordinary least squares (OLS) and with the measurement-error consistent high order moment estimators (GMM, hereafter). Table 8 reports condensed results from two analogous regressions, one in which we replace the bond rating dummy with a firm size dummy, and one in which we include both size and bond rating dummies. Table 9 reports diagnostic summary statistics on samples split by the existence of a bond rating.

Although all of the numbers in all of the tables change, we can group the tables according to whether the correct results differ from the previous results in terms of signs or significance. The estimates reported in Tables 2, 4, 5, and 9 are quantitatively and qualitatively similar to those in the previous versions. Table 2 reports the slope coefficient on Tobin's q. Both versions show that the GMM estimates are on average approximately three times the size of the OLS estimates, and the results are quantitatively similar. Tables 4 and 5 report estimates of the regression R^2 and an index of the measurement quality of Tobin's q. The estimates in these two tables are quantitatively similar. The OLS estimates of the regression R^2 are approximately 40% as large as the GMM estimates, and the measurement quality estimates indicate that just under half of the variation in Tobin's q is due to true marginal q. Finally, Table 9 again shows that cross-sectional cash flow variance is the main difference between the firms with and without bond ratings.

Tables 1, 6, and 7 change in minor ways that make the results stronger. Table 1 reports the p-values from the test of the identifying assumptions of the GMM estimators. The previous version reports one instance in which the null is not rejected. The correct version shows that the null of an unidentified model is always rejected, which is a stronger result in terms of estimator performance. Table 6 reports no rejections of the model overidentifying restrictions, whereas the previous version reported one rejection. Table 7 reports 3 rejections of the null of parameter constancy over time, and the old version reports 5 rejections.

Tables 3 and 8 change in minor ways that are hard to classify in terms of strength but that leave unchanged the message that it is hard to reject the null hypothesis that investment is insensitive to cash flow. In Table 3 all of the OLS estimates of the coefficients on cash flow are significantly positive, but on average 56% as large as the previous estimates. All but three of the GMM estimates are closer to zero in absolute value than the previous estimates. As before, only one of the GMM estimates of the cash flow coefficient is significantly greater than zero. In the second panel of Table 3 the OLS estimates are almost identical to the previous estimates, and all but two of the GMM estimates are closer to zero in absolute value than the previous estimates. One of the GMM minimum distance estimates is significantly greater than zero when using a 5% asymptotic critical value but not when using a 5% critical value from a block bootstrap. Before none of the GMM minimum distance estimates were significantly greater than zero. In Table 8 the estimates of the sum of the coefficients on cash flow and the interaction of cash flow with financial constraints indicators are significant using the asymptotic standard errors and a two-sided 5% nominal test. The estimates are not significant using the 5% critical values from a block bootstrap. Before none of these estimates were significantly greater than zero using asymptotic critical values. The rest of Table 8 is quantitatively similar to the previous version.

References

Mozumdar, Abon and Şenay Ağca. 2010. "Investment Cash Flow Sensitivity: Fact or Fiction?" Manuscript, George Washington University.

TABLE 1

p-VALUES FROM IDENTIFICATION TESTS: INTERACTION-TERM MODELS

Interaction-Term Model:	1992	1993	1994	1995
Bond Rating	.017	.023	.011	.008
Firm Size	.001	.000	.004	.031
Bond Rating and Firm Size	.004	.028	.001	.027

NOTE.—The null hypothesis is $\beta = 0$ and/or $E\left(\eta_i^3\right) = 0$. The model is identified if the null hypothesis is false.

TABLE 2

BOND-RATING INTERACTION MODEL: ESTIMATES OF β, THE COEFFICIENT ON MARGINAL q

	OLS	GMM3	GMM4	GMM5
1992	.010	.040	.037	.027
	(.003)	(.010)	(.007)	(.007)
1993	.010	.036	.036	.042
	(.003)	(.007)	(.007)	(.004)
1994	.010	.083	.048	.017
	(.003)	(.078)	(.013)	(.004)
1995	.016	.032	.044	.049
	(.003)	(.008)	(.009)	(.006)
Minimum Distance	.012	.038	.038	.032
	(.002)	(.004)	(.004)	(.003)

NOTE.—Standard errors are in parentheses under the parameter estimates.

TABLE 3

Bond-Rating Interaction Model: Estimates of α_1 and $\alpha_1 + \alpha_2$, the Cash-Flow Responses of Financially Unconstrained and Constrained Firms

	OLS	GMM3	GMM4	GMM5
α_1				
1992	.251	−.071	−.043	.073
	(.072)	(.160)	(.104)	(.098)
1993	.224	−.037	−.038	−.091
	(.057)	(.095)	(.095)	(.072)
1994	.229	−.468	−.134	.161
	(.045)	(.749)	(.133)	(.055)
1995	.183	.097	.038	.012
	(.060)	(.057)	(.063)	(.058)
Minimum Distance	.220	.049	−.005	.056
	(.037)	(.045)	(.053)	(.045)
$\alpha_1 + \alpha_2$				
1992	.125	.031	.039	.073
	(.059)	(.073)	(.062)	(.058)
1993	.084	.018	.018	.004
	(.030)	(.030)	(.030)	(.030)
1994	.083	−.087	−.006	.067
	(.026)	(.205)	(.042)	(.022)
1995	.073	.032	.004	−.008
	(.023)	(.030)	(.042)	(.039)
Minimum Distance	.078	.022	.010	.042
	(.017)	(.023)	(.024)	(.018)

Note.—Standard errors are in parentheses under the parameter estimates.

TABLE 4

Bond-Rating Interaction Model: Estimates of ρ^2, The Population R^2 of the Investment Equation

	OLS	GMM3	GMM4	GMM5
1992	.271	.414	.401	.436
	(.035)	(.115)	(.118)	(.105)
1993	.251	.386	.382	.467
	(.045)	(.097)	(.089)	(.069)
1994	.269	.576	.450	.349
	(.047)	(.279)	(.074)	(.060)
1995	.234	.312	.341	.386
	(.043)	(.061)	(.072)	(.057)
Minimum Distance	.258	.350	.385	.398
	(.028)	(.049)	(.049)	(.040)

Note.—We define the OLS estimate of ρ^2 to be the OLS R^2. Standard errors are in parentheses under the parameter estimates.

TABLE 5

Bond-Rating Interaction Model: Estimates of τ^2, The Population R^2 of the Measurement Equation

	GMM3	GMM4	GMM5
1992	.448	.438	.496
	(.058)	(.060)	(.060)
1993	.446	.445	.474
	(.058)	(.053)	(.052)
1994	.372	.469	.720
	(.065)	(.043)	(.084)
1995	.580	.523	.513
	(.055)	(.067)	(.066)
Minimum Distance	.501	.470	.505
	(.043)	(.040)	(.043)

Note.—Standard errors are in parentheses under the parameter estimates.

TABLE 6

Bond-Rating Interaction Model: p-Values of J-Tests of Overidentifying Restrictions

Year	GMM4	GMM5
1992	.690	.688
1993	.993	.780
1994	.758	.318
1995	.346	.666

TABLE 7

Bond-Rating Interaction Model: P-Values of Parameter Constancy Tests

Parameter	OLS	GMM3	GMM4	GMM5
β	.403	.890	.775	.000
α_1	.866	.347	.538	.004
$\alpha_1 + \alpha_2$	.841	.908	.924	.124
ρ^2	.833	.668	.675	.468
τ^2	—	.054	.765	.027

TABLE 8

MINIMUM DISTANCE ESTIMATES OF OTHER INTERACTION-TERM MODELS

	OLS	GMM3	GMM4	GMM5
β				
Firm Size	.012	.037	.028	.027
	(.002)	(.004)	(.002)	(.002)
Bond Rating and Firm Size	.011	.040	.039	.029
	(.002)	(.004)	(.004)	(.002)
α_1				
Firm Size	.138	−.018	.027	.034
	(.027)	(.038)	(.032)	(.030)
Bond Rating and Firm Size	.224	.011	−.030	.086
	(.038)	(.048)	(.057)	(.042)
α_1+ coefficients on interaction term(s)				
Firm Size	.072	.050	.053	.055
	(.020)	(.021)	(.019)	(.020)
Bond Rating and Firm Size	.072	.045	.048	.052
	(.021)	(.022)	(.021)	(.021)
ρ^2				
Firm Size	.247	.357	.358	.374
	(.029)	(.049)	(.045)	(.039)
Bond Rating and Firm Size	.260	.366	.395	.389
	(.028)	(.050)	(.048)	(.041)
τ^2				
Firm Size		.506	.555	.581
		(.049)	(.044)	(.043)
Bond Rating and Firm Size		.516	.505	.587
		(.047)	(.043)	(.041)

NOTE.—We define the OLS estimate of ρ^2 to be the OLS R^2. Standard errors are in parentheses under the parameter estimates.

TABLE 9

ESTIMATES OF μ_{x1}, μ_{y1}, AND VAR(z_{i1})

	1992	1993	1994	1995
$\hat{\mu}_{y1}$				
Constrained	.159	.109	.107	.111
Unconstrained	.366	.322	.327	.263
$\hat{\mu}_{x1}$				
Constrained	3.217	2.521	2.349	2.457
Unconstrained	10.990	9.938	9.604	5.155
$\hat{\mu}_{y1}/\hat{\mu}_{x1}$				
Constrained	.043	.043	.046	.045
Unconstrained	.033	.032	.034	.051
$\widehat{\text{var}}(z_{i1})$				
Constrained	.067	.082	.110	.135
Unconstrained	.035	.031	.035	.030