

# How University Endowments Respond to Financial Market Shocks: Evidence and Implications

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## Online Appendix

**Online Appendix Table 1—Payout Rates of University Endowments (in percentage points),  
Robustness Checks**

	<i>Payout Rate, 1993-2009</i>			
	(1)	(2)	(3)	(4)
Shock_POS <sub><i>i,t</i></sub> = Max(Shock <sub><i>i,t</i></sub> , 0)	0.16 (0.15)	0.11 (0.19)	0.18 (0.12)	0.53** (0.23)
Shock_NEG <sub><i>i,t</i></sub> = Min(Shock <sub><i>i,t</i></sub> , 0)	1.61*** (0.62)	1.93** (0.83)	1.58*** (0.56)	2.28** (0.96)
Shock_POS <sub><i>i,t-1</i></sub>	-0.46*** (0.15)	-0.48** (0.19)	-0.43*** (0.13)	-0.98** (0.24)
Shock_NEG <sub><i>i,t-1</i></sub>	-0.48 (0.74)	-0.31 (1.00)	-0.20 (0.65)	0.20 (1.18)
Rev Shock_POS <sub><i>i,t</i></sub>	0.77 (0.61)	0.51 (0.80)	0.43 (0.40)	0.81 (0.61)
Rev Shock_NEG <sub><i>i,t</i></sub>	-0.47 (0.83)	-0.71 (1.05)	-0.41 (0.75)	-0.61 (0.82)
Rev Shock_POS <sub><i>i,t-1</i></sub>	1.23** (0.57)	0.14 (0.71)	0.69* (0.39)	1.20** (0.57)
Rev Shock_NEG <sub><i>i,t-1</i></sub>	-1.46 (0.91)	-1.93* (1.15)	-1.03 (0.82)	-1.48 (0.91)
Joint <i>p</i> -value of Endowment Shocks	0.00***	0.01***	0.00***	0.00***
<i>p</i> -value of test Shock_POS <sub><i>i,t</i></sub> = Shock_NEG <sub><i>i,t</i></sub>	0.03**	0.04**	0.02**	0.10*
<i>p</i> -value of test Shock_POS <sub><i>i,t-1</i></sub> = Shock_NEG <sub><i>i,t-1</i></sub>	0.98	0.87	0.74	0.36
Joint <i>p</i> -value of Revenue Shocks	0.11	0.49	0.25	0.10*
University Fixed Effects	Yes	Yes	Yes	Yes
Year-by-Private Fixed Effects	Yes	Yes	Yes	Yes
State-by-Year-by-Private Fixed Effects	No	Yes	No	No
Sample includes prestigious Liberal Arts Schools	No	No	Yes	No
Use Endowment-Costs ratio at start of sample when creating SHOCK variables	No	No	No	Yes
R-squared (within a university)	0.24	0.55	0.25	0.24
Number of Observations	2,869	2,869	3,087	2,869

*Notes:* See Table 2 for variable definitions. The results from column (3) in Table 4 are reported in the first column of this table. The other specifications in this table are robustness checks of the regression in column (3) in Table 4. The baseline sample only includes doctoral universities. Standard errors, shown in parentheses, allow for correlations among observations of a given university over time (i.e., are clustered by university). \*\*\*, \*\*, \* denote significance at the 1%, 5%, and 10% levels, respectively.

**Online Appendix Table 2—Interaction of Endowment Shocks with Endowment Size  
Being Near President’s Benchmark, Robustness Checks**

	<i>Payout Rate (in percent)</i>			
	(1)	(2)	(3)	(4)
Shock_POS <sub><i>i,t</i></sub>	0.07 (0.22)	-0.11 (0.32)	0.14 (0.18)	0.52 (0.33)
Shock_POS <sub><i>i,t</i></sub> × Near Benchmark	-0.48 (0.52)	-0.39 (0.63)	-0.18 (0.39)	0.26 (1.13)
Shock_NEG <sub><i>i,t</i></sub>	0.90 (0.84)	0.82 (1.23)	0.87 (0.76)	0.62 (1.30)
Shock_NEG <sub><i>i,t</i></sub> × Near Benchmark	2.96** (1.21)	3.73** (1.60)	2.63** (1.11)	3.42* (1.78)
Shock_POS <sub><i>i,t-1</i></sub>	-0.53** (0.22)	-0.42 (0.32)	-0.45** (0.18)	-0.89*** (0.34)
Shock_POS <sub><i>i,t-1</i></sub> × Near Benchmark	0.39 (0.45)	0.51 (0.55)	0.14 (0.33)	-0.18 (0.83)
Shock_NEG <sub><i>i,t-1</i></sub>	-0.42 (1.07)	-1.23 (1.56)	-0.27 (0.93)	0.30 (1.67)
Shock_NEG <sub><i>i,t-1</i></sub> × Near Benchmark	-2.18 (2.12)	-1.83 (2.72)	-1.90 (1.70)	-3.59 (3.41)
Revenue Shock Controls	Yes	Yes	Yes	Yes
University Fixed Effects	Yes	Yes	Yes	Yes
Year-by-Private Fixed Effects	Yes	Yes	Yes	Yes
State-by-Year-by-Private Fixed Effects	No	Yes	No	No
Sample includes prestigious Liberal Arts Schools	No	No	Yes	No
Use Endowment-Costs ratio at start of sample when creating SHOCK variables	No	No	No	Yes
R-squared (within)	0.21	0.58	0.22	0.21
Number of Observations	1,991	1,991	2,157	1,991

*Notes:* See Table 2 for variable definitions. The results from column (2) in Table 6 are reported in the first column of this table. The other specifications in this table are robustness checks of the regression in column (2) in Table 6. The baseline sample only includes doctoral universities. Each shock variables is interacted with an indicator for whether the value of the university endowment at the start of the year is 90-110% of the value of the endowment when the current university president took office (“Near Benchmark”). Standard errors, shown in parentheses, allow for correlations among observations of a given university over time (i.e., are clustered by university). \*\*\*, \*\*, \* denote significance at the 1%, 5%, and 10% levels, respectively.

**Online Appendix Table 3—Relation between Number of Tenure-System Faculty  
(in Logarithms) and Endowment Shocks, Robustness Checks**

	(1)	(2)	(3)	(4)
Shock_POS <sub><i>i,t</i></sub> = Max(Shock <sub><i>i,t</i></sub> , 0)	-0.03 (0.03)	-0.02 (0.03)	-0.02 (0.02)	0.01 (0.04)
Shock_NEG <sub><i>i,t</i></sub> = Min(Shock <sub><i>i,t</i></sub> , 0)	0.14 (0.11)	0.29** (0.13)	0.13 (0.10)	-0.02 (0.17)
Shock_POS <sub><i>i,t-1</i></sub>	-0.04 (0.02)	0.05 (0.03)	-0.03 (0.02)	-0.08** (0.04)
Shock_NEG <sub><i>i,t-1</i></sub>	0.49*** (0.15)	0.61*** (0.19)	0.41*** (0.13)	0.44* (0.23)
Rev Shock_POS <sub><i>i,t</i></sub>	0.18* (0.10)	0.08 (0.13)	0.06 (0.07)	0.17 (0.11)
Rev Shock_NEG <sub><i>i,t</i></sub>	0.22 (0.14)	0.51*** (0.18)	0.25* (0.14)	0.19 (0.14)
Rev Shock_POS <sub><i>i,t-1</i></sub>	0.20* (0.12)	0.24 (0.15)	0.19* (0.11)	0.19 (0.12)
Rev Shock_NEG <sub><i>i,t-1</i></sub>	-0.10 (0.15)	-0.24 (0.18)	-0.08 (0.13)	-0.08 (0.15)
<i>p</i> -value of test Shock_POS <sub><i>i,t</i></sub> = Shock_NEG <sub><i>i,t</i></sub>	0.17	0.03**	0.16	0.89
<i>p</i> -value of test Shock_POS <sub><i>i,t-1</i></sub> = Shock_NEG <sub><i>i,t-1</i></sub>	0.00***	0.00***	0.00***	0.03**
University Fixed Effects	Yes	Yes	Yes	Yes
Year-by-Private Fixed Effects	Yes	Yes	Yes	Yes
State-by-Year-by-Private Fixed Effects	No	Yes	No	No
Sample includes prestigious Liberal Arts Schools	No	No	Yes	No
Use Endowment-Costs ratio at start of sample when creating SHOCK variables	No	No	No	Yes
R-squared (within)	0.67	0.83	0.69	0.67
Number of Observations	2,980	2,980	3,201	2,980

*Notes:* See Table 2 for variable definitions. The results from column (1) in Table 7 are reported in the first column of this table. The other specifications in this table are robustness checks of the regression in column (1) in Table 7. The baseline sample only includes doctoral universities. Standard errors, shown in parentheses, allow for correlations among observations of a given university over time (i.e., are clustered by university). \*\*\*, \*\*, \* denote significance at the 1%, 5%, and 10% levels, respectively.

**Online Appendix Table 4—Relation between Number of Tenure-System Faculty (in Logarithms) and the Interaction of Endowment Shocks with Endowment Size Being Near President’s Benchmark, Robustness Checks**

	(1)	(2)	(3)	(4)
<b>Shock_POS<sub>i,t</sub></b>	<b>-0.01</b>	<b>0.01</b>	<b>-0.01</b>	<b>0.01</b>
	(0.03)	(0.04)	(0.03)	(0.05)
<b>Shock_POS<sub>i,t</sub> × Near Benchmark</b>	<b>-0.10</b>	<b>0.02</b>	<b>-0.08</b>	<b>-0.23*</b>
	(0.07)	(0.08)	(0.06)	(0.13)
<i>Total effect of Shock_POS<sub>i,t</sub> when endowment Near Benchmark</i>	<i>-0.10</i>	<i>0.03</i>	<i>-0.09</i>	<i>-0.22</i>
<b>Shock_NEG<sub>i,t</sub></b>	<b>0.19</b>	<b>0.34**</b>	<b>0.18*</b>	<b>0.04</b>
	(0.12)	(0.15)	(0.11)	(0.18)
<b>Shock_NEG<sub>i,t</sub> × Near Benchmark</b>	<b>0.10</b>	<b>0.43**</b>	<b>0.14</b>	<b>0.31</b>
	(0.16)	(0.19)	(0.15)	(0.25)
<i>Total effect of Shock_NEG<sub>i,t</sub> when endowment Near Benchmark</i>	<i>0.29</i>	<i>0.76***</i>	<i>0.32*</i>	<i>0.35</i>
<b>Shock_POS<sub>i,t-1</sub></b>	<b>-0.05</b>	<b>-0.01</b>	<b>-0.04</b>	<b>-0.07</b>
	(0.03)	(0.04)	(0.02)	(0.05)
<b>Shock_POS<sub>i,t-1</sub> × Near Benchmark</b>	<b>0.11*</b>	<b>0.11</b>	<b>0.09**</b>	<b>0.28***</b>
	(0.06)	(0.07)	(0.05)	(0.11)
<i>Total effect of Shock_POS<sub>i,t-1</sub> when endowment Near Benchmark</i>	<i>0.06</i>	<i>0.11</i>	<i>0.06</i>	<i>0.21*</i>
<b>Shock_NEG<sub>i,t-1</sub></b>	<b>0.30</b>	<b>0.41*</b>	<b>0.25</b>	<b>0.14</b>
	(0.19)	(0.25)	(0.16)	(0.29)
<b>Shock_NEG<sub>i,t-1</sub> × Near Benchmark</b>	<b>0.84**</b>	<b>1.25**</b>	<b>0.49*</b>	<b>1.18**</b>
	(0.39)	(0.49)	(0.28)	(0.56)
<i>Total effect of Shock_NEG<sub>i,t-1</sub> when endowment Near Benchmark</i>	<i>1.14***</i>	<i>1.66***</i>	<i>0.73**</i>	<i>1.32**</i>
Revenue Shock Controls	Yes	Yes	Yes	Yes
University Fixed Effects	Yes	Yes	Yes	Yes
Year-by-Private Fixed Effects	Yes	Yes	Yes	Yes
State-by-Year-by-Private Fixed Effects	No	Yes	No	No
Sample includes prestigious Liberal Arts Schools	No	No	Yes	No
Use Endowment-Costs ratio at start of sample when creating SHOCK variables	No	No	No	Yes
R-squared (within)	0.69	0.87	0.71	0.69
Number of Observations	2,224	2,224	2,390	2,224

*Notes:* See Table 2 for variable definitions. The results from column (1) in Table 8 are reported in the first column of this table. The other specifications in this table are robustness checks of the regression in column (1) in Table 8. The baseline sample only includes doctoral universities. The “*Total effect of Shock\_POS<sub>i,t</sub> when endowment Near Benchmark*” is the sum of the coefficient estimates on Shock\_POS<sub>i,t</sub> and its interaction with Near Benchmark. Other Shock variables are defined in a similar way. We omit the standard errors for the “*Total effect of Shock when endowment Near Benchmark*” effects and only indicate their statistical significance. Near Benchmark indicates that the value of the university endowment at the start of the year is 90-110% of the value of the endowment when the current university president took office. Standard errors, shown in parentheses, allow for correlations among observations of a given university over time (i.e., are clustered by university). \*\*\*, \*\*, \* denote significance at the 1%, 5%, and 10% levels, respectively.