Replication Results

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Table 1: SUE Persistence and Abnormal Returns-Base Case

	Panel A: SUE (Dependent Variable $DSUE_{t+k}$)			Panel B: 3-Day Abnormal Returns (Dependent
	$k=1$	$k=2$	$k=3$	$k=4$
$DSUE_t$	0.433***	0.103***	0.034***	-0.278***
	(27.77)	(17.50)	(5.61)	(-28.65)
	$k=1$	$k=2$	$k=3$	$k=4$
$DSUE_t$	6.131***	2.137***	-0.231***	-0.630***
	(15.51)	(7.58)	(-4.01)	(-10.49)
	$k=1$	$k=2$	$k=3$	$k=4$
$DSUE_t$	-0.0782***	0.0263***	-0.0027	-0.0023
	(-10.12)	(6.01)	(-0.64)	(-0.62)

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$

Coefficients and t-statistics (in parentheses) are from Fama-Macbeth regressions with Newey-West standard errors, which are robust to autocorrelation and heteroskedasticity.

Table 2: Quarterly Earnings Volatility and Earnings Persistence

	β (Persistence)	t-statistics	R^2 Adj R^2
Panel A: Foster Model			
Volatility Q1 (low)	0.262***	17.63	
Volatility Q2	0.355***	18.03	
Volatility Q3	0.441***	15.77	
Volatility Q4	0.592***	10.45	
Volatility Q5 (high)	0.688***	3.34	
Difference (Q1-Q5)	-0.426***		
P-value on difference	0.0001		
Panel B: AR(1) Model			
Volatility Q1 (low)	0.778***	235.77	
Volatility Q2	0.650***	10.16	
Volatility Q3	0.687***	86.71	
Volatility Q4	0.723***	233.39	
Volatility Q5 (high)	0.556***	236.79	
Difference (Q1-Q5)	0.222***		
P-value on difference	0.0001		

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$

Table 3: Effect of Earnings Volatility on SUE Persistence (Dependent Variable DSUE_{t+1})

	Model 1	Model 2	Model 3	Model 4	Model 5
DSUEA_t	0.1794***	0.2845***	0.0526***	0.1763***	0.0004***
	(22.02)	(18.00)	(20.12)	(22.38)	(3.17)
$\text{EVOL} \times \text{DSUEA}_t$	1.6202***		1.4363***	1.5718***	0.0077***
	(54.83)		(70.91)	(46.45)	(4.91)
EVOL_t	-0.8893***		-0.7870***	-0.8607***	-0.0043***
	(-37.24)		(-63.71)	(-33.52)	(-4.79)
$\text{Size} \times \text{DSUE}_t$		1.8150***	1.5147***		
		(35.49)	(88.84)		
Size_t		-1.0009***	-0.8299***		
		(-33.57)	(-45.95)		
$\text{Loss} \times \text{DSUE}_t$				1.5718***	
				(46.45)	
Loss_t				-0.8607***	
				(-33.52)	
$\text{I} \times \text{DSUE}_t$					0.9968***
					(1498.42)
I_t					-0.1021***
					(-6.71)
cons	0.4470***	0.3899***	0.5153***	0.4498***	0.1036***
	(34.27)	(38.67)	(50.60)	(34.36)	(6.70)

Notes: This table presents the regression results for the effect of earnings volatility on SUE persistence. The dependent variable is DSUE_{t+1}. Newey-West standard errors are used to correct for heteroskedasticity and autocorrelation.

Source: Author's calculations.

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$

Table 4: Effect of Earnings Volatility on PEAD returns

	Panel A: 3-Day Returns			Panel B: Quarterly Returns		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
$DSUE_t$	0.0510***	0.0559***	0.0397***	-0.0219**	-0.0197**	-0.0132
	(10.80)	(12.59)	(6.12)	(-2.22)	(-2.05)	(-0.67)
$EVOL_t \times DSUE_t$	0.0180**	0.0171	0.0181**	-0.0646***	-0.0577***	-0.0649***
	(2.08)	(1.93)	(2.09)	(-3.18)	(-3.11)	(-3.17)
$EVOL_t$	-0.0166***	-0.0132**	-0.0167***	-0.0668***	-0.0741***	-0.0666***
	(-3.28)	(-2.37)	(-3.29)	(-5.90)	(-6.32)	(-5.87)
$Size_t$	0.0175***	0.0155***	0.0175***	-0.1356***	-0.1290***	-0.1355***
	(4.42)	(3.54)	(4.43)	(-9.62)	(-10.13)	(-9.66)
$Size_t \times DSUE_t$	-0.0548***	-0.0650***	-0.0549***	-0.0413	-0.0445*	-0.0414
	(-8.57)	(-9.94)	(-8.60)	(-1.77)	(-1.90)	(-1.76)
$Loss_t$		-0.0074***		0.0179**	0.0012	
		(-4.55)		(2.42)	(0.10)	
$Loss_t \times DSUE_t$		-0.0114		-0.0013	0.0086	
		(-1.12)		(-0.13)	(0.49)	
I_t			-0.0058***			0.0012
			(-3.31)			(0.10)
$I_t \times DSUE_t$			0.0114**			-0.0086
			(2.75)			(-0.51)
cons	-0.0198***	-0.0181***	-0.0140***	0.0816***	0.0777***	0.0803***
	(-6.86)	(-6.39)	(-4.47)	(11.25)	(11.81)	(5.42)

Notes: This table presents the regression results of the effect of earnings volatility on PEAD returns. Panel A shows the 3-Day Returns, and Panel B presents the Quarterly Returns.

Source: Author's calculations.

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$

Table 5: Test of Stock Market Efficiency for the Volatility Effect

Parameter	3-Day		Quarter-Long	
	Coefficient	t-statistics	Coefficient	t-statistics
a	0.2920***	(206.22)	0.2920***	(206.22)
b	0.4643***	(166.59)	0.4643***	(166.59)
c	0.2534**	(1.97)	0.2534**	(1.97)
d	0.0100***	(2.55)	0.0100***	(2.55)
$a*$	-0.0199***	(-18.13)	0.0533***	(17.50)
β	0.0481***	(41.00)	0.0555***	(17.09)
$b*$	-1.3202***	(-33.78)	-0.2720***	(-2.89)
$c*$	-0.0519	(-1.15)	0.1207	(1.14)
$d*$	-0.6029***	(-9.29)	1.2631***	(8.11)
g	0.0261***	(19.68)	-0.0730***	(-19.87)
h	-0.0608***	(-17.90)	-0.0959***	(-10.19)

Notes: This table presents the coefficient estimates from the simultaneous estimation of the two equations using the simultaneous nonlinear procedure proposed by Mishkin (1983).

Source: Author's calculations.

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$

Table 6: Robustness Test: Analyst Forecast-Based Earnings Surprise

	Dependent Var DSUE_{t+1}		Dependent Var $\text{AR}_{q,t+1}$		Dependent Var $\text{AR}_{q,t+1}$	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
DSUEA_t	0.5157***	0.3533***	13.0425***	4.2010***	-12.8088***	-1.4473
	(13.88)	(4.36)	(7.32)	(2.76)	(-3.08)	(-0.31)
$\text{EVOL}_t \times \text{DSUEA}_t$		0.2451**	0.3362	1.6701	3.3158	3.0394
		(2.10)	(0.12)	(0.64)	(0.56)	(0.49)
EVOL_t		0.0001	-0.0027*	-0.0054**	-0.0982***	-0.0926***
		(1.28)	(-1.76)	(-3.13)	(-11.84)	(-12.18)
Size_t			-0.0082***	-0.0118***	-0.1473***	-0.1407***
			(-3.25)	(-4.48)	(-11.27)	(-11.12)
$\text{Size}_t \times \text{DSUE}_t$			31.7452***	16.0331***	-27.6065***	1.7152
			(7.98)	(2.63)	(-3.71)	(0.22)
DSUE_t				0.0398***		-0.0571***
				(13.79)		(-9.40)
cons	-0.0000	-0.0000	0.0056***	-0.0143***	0.0664***	0.0933***
	(-0.47)	(-0.83)	(4.62)	(-6.72)	(13.08)	(13.46)

Notes: This table presents the robustness test results using analyst forecast-based earnings surprise.

Source: Author's calculations.

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$

TABLE 2

SUE Persistence and Abnormal Returns-Base Case

	$k=1$		$k=2$		$k=3$		$k=4$	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Panel A: SUE (Dependent Variable $DSUE_{t+k}$)								
$DSUE_t$	0.365^{***}	0.40^{***}	0.203^{***}	0.23^{***}	0.066^{***}	0.09^{***}	-0.172^{***}	-0.17^{***}
	(79)		(57.51)		(11.56)		(−27.58)	
Adj R^2	0.133^{***}		0.041^{***}		0.005^{***}		0.030^{***}	
	(39.43)		(28.3)		(6.06)		(12.64)	
	$k=1$		$k=2$		$k=3$		$k=4$	
Panel B: 3-Day Abnormal Returns (Dependent Variable $AR_{t,t+k}$)								
$DSUE_t$	0.793^{***}		0.261^{***}		-0.231^{***}		-0.630^{***}	
	(4.41)		(3.17)		(−4.01)		(−10.49)	
Adj R^2	0.001^{***}		0.000^{**}		0.000^{***}		0.001^{***}	
	(3.66)		(2.08)		(2.89)		(4.25)	
Panel C: Quarter-Long Abnormal Returns (Dependent Variable $AR_{q,t+k}$)								
$DSUE_t$	6.131^{***}		2.137^{***}		0.697^{**}		−0.450	
	(15.51)		(7.58)		(2.2)		(−1.1)	
Adj R^2	0.008^{***}		0.001^{***}		0.000^{***}		0.000^{**}	
	(6.47)		(4.72)		(4.27)		(2.76)	

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.

TABLE 3

Quarterly Earnings Volatility and Earnings Persistence

Panel A: Foster Model

$$(Q_{t+1} - Q_{t-3}) = \alpha + \beta\left(Q_{t+1} - Q_{t-3}\right) + \varepsilon_{t+1}$$
$$DSUE_{t+1} = \alpha + \beta DSUE_t + \varepsilon_{t+1}$$

Quintiles by *VOL* (Quarterly Earnings)	β (Persistence)	*t*-statistics	R^2	Adj R^2
Volatility Q1 (low)	**0.425*****	107.110	0.158	**0.158**
Volatility Q2	**0.406*****	104.690	0.152	**0.152**
Volatility Q3	**0.392*****	104.630	0.152	**0.152**
Volatility Q4	**0.365*****	98.320	0.136	**0.136**
Volatility Q5 (high)	**0.319*****	85.730	0.107	**0.107**
Difference(Q1 − Q5)	**0.106*****			
P-value on difference	**<0.0001**			

Panel B: AR(1) Model

$$Q_{t+1} = \alpha + \theta Q_t + \varepsilon_{t+1}$$

Quintiles by *VOL* (quarterly earnings)	θ (Persistence)	*t*-statistics	R^2	Adj R^2
Volatility Q1 (low)	**0.948*****	170.120	0.329	**0.329**
Volatility Q2	**0.921*****	31.570	0.016	**0.016**
Volatility Q3	**0.901*****	135.640	0.236	**0.236**
Volatility Q4	**0.805*****	145.760	0.265	**0.265**
Volatility Q5 (high)	**0.276*****	91.360	0.126	**0.126**
Difference(Q1−Q5)	**0.672*****			
P-value on difference	**<0.0001**			

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.

Q is quarterly earnings before extraordinary items deflated by average total assets. *SUE* is the difference between the current quarter's earnings and the earnings from the previous year's corresponding quarter, scaled by the market value at the end of the previous quarter. *DSUE* is the *SUE* decile rank for each quarter transformed by dividing the rank by 9 and subtracting 0.5, resulting in values that range from −0.5 to +0.5. *VOL* is the variance of the most recent eight quarterly earnings (including quarter *t*), scaled by average total assets. The key variables of interest have been presented in boldface.

TABLE 4

Effect of Earnings Volatility on SUE Persistence (Dependent Variable $DSUE_{t+1}$)

	Model 1	Model 2	Model 3	Model 4	Model 5
$DSUE_t$	0.379***	0.369***	0.379***	0.395***	0.295***
	(76.87)	(76.6)	(74.62)	(61.95)	(53.36)
$\mathbf{EVOL_t \times DSUE_t}$	**−0.136*** **		**−0.129*** **	**−0.100*** **	**−0.134*** **
	(−10.11)		**(−10.25)**	**(−8.57)**	**(−10.06)**
$EVOL_t$	0.027***		0.027***	0.035***	0.027***
	(4.37)		(4.23)	(6.64)	(4.35)
$Size_t \times DSUE_t$		0.058***	0.022*		
		(4.75)	(1.96)		
$Size_t$		−0.005	0.003		
		(−0.8)	(0.4)		
$Loss_t \times DSUE_t$				−0.092***	
				(−7.51)	
$Loss_t$				−0.032***	
				(−7.2)	
$I_t \times DSUE_t$					0.115***
					(14.66)
I					0.008***
					(4.33)
Adj R^2	0.136***	0.134***	0.137***	0.139***	0.139***
	(40.83)	(39.39)	(40.71)	(39.4)	(39.86)

***$p < 0.01$, **$p < 0.05$, *$p < 0.10$.

TABLE 5

Effect of Earnings Volatility on PEAD returns

	Panel A: 3-Day Returns (Dependent Var $AR_{s,t+1}$)			Panel B: Quarterly Returns (Dependent Var $AR_{q,t+1}$)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
$DSUE_t$	0.711***	0.689***	−0.036	6.059***	6.393***	3.368***
	(5.39)	(4.24)	(−0.2)	(15.57)	(16.08)	(6.2)
$\mathbf{EVOL_t \times DSUE_t}$	**−0.625** **	**−0.583** **	**−0.583** **	**−5.016*** **	**−4.027*** **	**−4.819*** **
	(−2.74)	**(−2.19)**	**(−2.53)**	**(−7.28)**	**(−4.95)**	**(−7.08)**
$EVOL_t$	−0.497***	−0.355***	−0.499***	0.302	0.695	0.304
	(−3.79)	(−3.2)	(−3.82)	(0.2)	(0.56)	(0.2)
$Size_t$	−0.568***	−0.628***	−0.566***	−2.154*	−2.409**	−2.16*
	(−3.12)	(−3.67)	(−3.14)	(−2.04)	(−2.41)	(−2.06)
$Size_t \times DSUEt$	−2.012***	−2.115***	−1.976***	−7.761***	−8.391***	−7.656***
	(−8.52)	(−8.5)	(−8.43)	(−10.39)	(−10.25)	(−9.98)
$Loss_t$		−0.357***			−1.311**	
		(−4.87)			(−2.11)	
$Loss_t \times DSUE_t$		−0.421*			−2.694***	
		(−1.89)			(−2.95)	
I_t			−0.234***			−0.809
			(−3.39)			(−1.4)
$I_t \times DSUE_t$			1.017***			3.651***
			(6.24)			(5.61)
Adj R^2	0.003***	0.004***	0.004***	0.016***	0.018***	0.019***
	(8.97)	(9.87)	(9.54)	(6.45)	(6.67)	(7.21)

TABLE 6

Test of Stock Market Efficiency for the Volatility Effect

Coefficient estimates from the simultaneous estimation of the following two equations using the simultaneous nonlinear procedure proposed by Mishkin [1983]:

$$DSUE_{t+1} = a + bDSUE_t + cEVOL_t + d(DSUE_t \times EVOL_t) + \varepsilon_{t+1}, \quad (14)$$

$$AR_{t+1} = a^* - \beta\, DSUE_{t+1} - \beta\, b^* DSUE_t - \beta\, c^* EVOL_t - \beta d^* (DSUE_t \times EVOL_t) + gSize_{t+1} + h(Size_{t+1} \times DSUE_{t+1}) + \mu_{t+1}. \quad (15)$$

Parameter	3-Day	Quarter-Long
b	0.382^{***}	0.382^{***}
	(211.1)	(211.06)
b^*	0.265^{***}	-0.047^{***}
	(26.78)	(−3.57)
d	-0.129^{***}	-0.129^{***}
	(−22.64)	(−22.63)
$\boldsymbol{d^*}$	**0.008**	$\mathbf{0.211}^{***}$
	(0.25)	**(5.39)**
β	5.619^{***}	14.277^{***}
	(103)	(83.99)
Likelihood Ratio Statistics to Test Market Efficiency Constrains		
$b = b^*$	136.46^{***}	$1{,}235.7^{***}$
$\boldsymbol{d = d^*}$	$\mathbf{18.02}^{***}$	$\mathbf{74.80}^{***}$

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.

T-statistics are in parentheses.

$AR_{q,t+1}$ is the market-adjusted buy-and-hold return (computed as the raw return adjusted for the CRSP value-weighted index), calculated from two days after the quarter t earnings announcement date through one day before the next announcement date. $AR_{s,t+1}$ is the market-adjusted buy-and-hold return (computed as the raw return adjusted for the CRSP value-weighted index), calculated during the three-day window (−1, +1) around quarter $t + 1$'s announcement. *SUE* is the difference between the current quarter's earnings and the earnings from the previous year's corresponding quarter, scaled by the market value at the end of the previous quarter. *DSUE* is the *SUE* decile rank for each quarter transformed by dividing the rank by 9 and subtracting 0.5, resulting in values that range from −0.5 to +0.5. *VOL* is the variance of the most recent eight quarterly earnings (including quarter t), scaled by average total assets. *EVOL* is the earnings volatility (*VOL*) decile rank for each quarter transformed by dividing the rank by 9 and subtracting 0.5, resulting in values that range from −0.5 to +0.5. *Size* is the decile rank of market value at the end of the previous quarter, transformed by dividing the rank by 9 and subtracting 0.5, resulting in values that range from −0.5 to +0.5. The key variables of interest have been presented in boldface.

TABLE 9

Robustness Test: Analyst Forecast-Based Earnings Surprise

	(Dependent Var $DSUEA_{t+1}$)		(Dependent Var ARq_{t+1})		(Dependent Var $AR_{q,t+1}$)	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
$DSUEA_t$	0.207^{***}	0.210^{***}	0.348^{***}	0.331^{***}	4.127^{***}	3.495^{***}
	(27.85)	(27.07)	(3.19)	(3.73)	(11.08)	(10.27)
$\boldsymbol{EVOL_t \times DSUEA_t}$		$\boldsymbol{-0.071^{***}}$	$\boldsymbol{-0.622^{**}}$	$\boldsymbol{-0.628^{***}}$	$\boldsymbol{-2.267^{**}}$	$\boldsymbol{-2.330^{***}}$
		(−4.69)	**(−2.87)**	**(−2.9)**	**(−3.02)**	**(−3.14)**
$EVOL_t$		0.013	-0.266^{*}	-0.261^{*}	0.460	0.491
		(1.5)	(−2.05)	(−2.04)	(0.32)	(0.34)
$Size_t$			0.021	0.027	-2.410^{*}	-2.424^{*}
			(0.15)	(0.19)	(−1.96)	(−1.98)
$Size_t \times DSUEA_t$			-1.034^{***}	-1.029^{***}	-3.609^{***}	-3.564^{***}
			(−3.62)	(−3.57)	(−3.74)	(−3.68)
$DSUEA$				0.037		1.685^{***}
				(0.39)		(5.08)
Adj R^2	0.043^{***}	0.045^{***}	0.002^{***}	0.002^{***}	0.018^{***}	0.019^{***}
	(14.2)	(14.59)	(5.34)	(5.65)	(5.45)	(5.98)

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.

Coefficients and t-statistics (in parentheses) are from Fama-Macbeth regressions with Newey-West standard errors, which are robust to autocorrelation and heteroskedasticity.

$AR_{q,t+1}$ is the market-adjusted buy-and-hold return (computed as the raw return adjusted for the CRSP value-weighted index), calculated from two days after the quarter t earnings announcement date through one day before the next announcement date. $AR_{e,t+1}$ is the market-adjusted buy-and-hold return (computed as the raw return adjusted for the CRSP value-weighted index), calculated during the three-day window $(-1, +1)$ around quarter $t + 1$'s announcement. *SUE* is the difference between the current quarter's earnings and the earnings from the previous year's corresponding quarter, scaled by the market value at the end of the previous quarter. *DSUEA* is the analyst-based earnings surprise calculated as the I/B/E/S actual minus I/B/E/S median forecast during the 90-day period before the earnings announcement date, scaled by price per share at quarter end. *VOL* is the variance of the most recent eight quarterly earnings (including quarter t), scaled by average total assets. *EVOL* is the earnings volatility (*VOL*) decile rank for each quarter transformed by dividing the rank by 9 and subtracting 0.5, resulting in values that range from −0.5 to +0.5. *Size* is the decile rank of market value at the end of the previous quarter, transformed by dividing the rank by 9 and subtracting 0.5, resulting in values that range from −0.5 to +0.5. The key variables of interest have been presented in boldface.