

Vulnerable Asset Management? The Case of Mutual Funds

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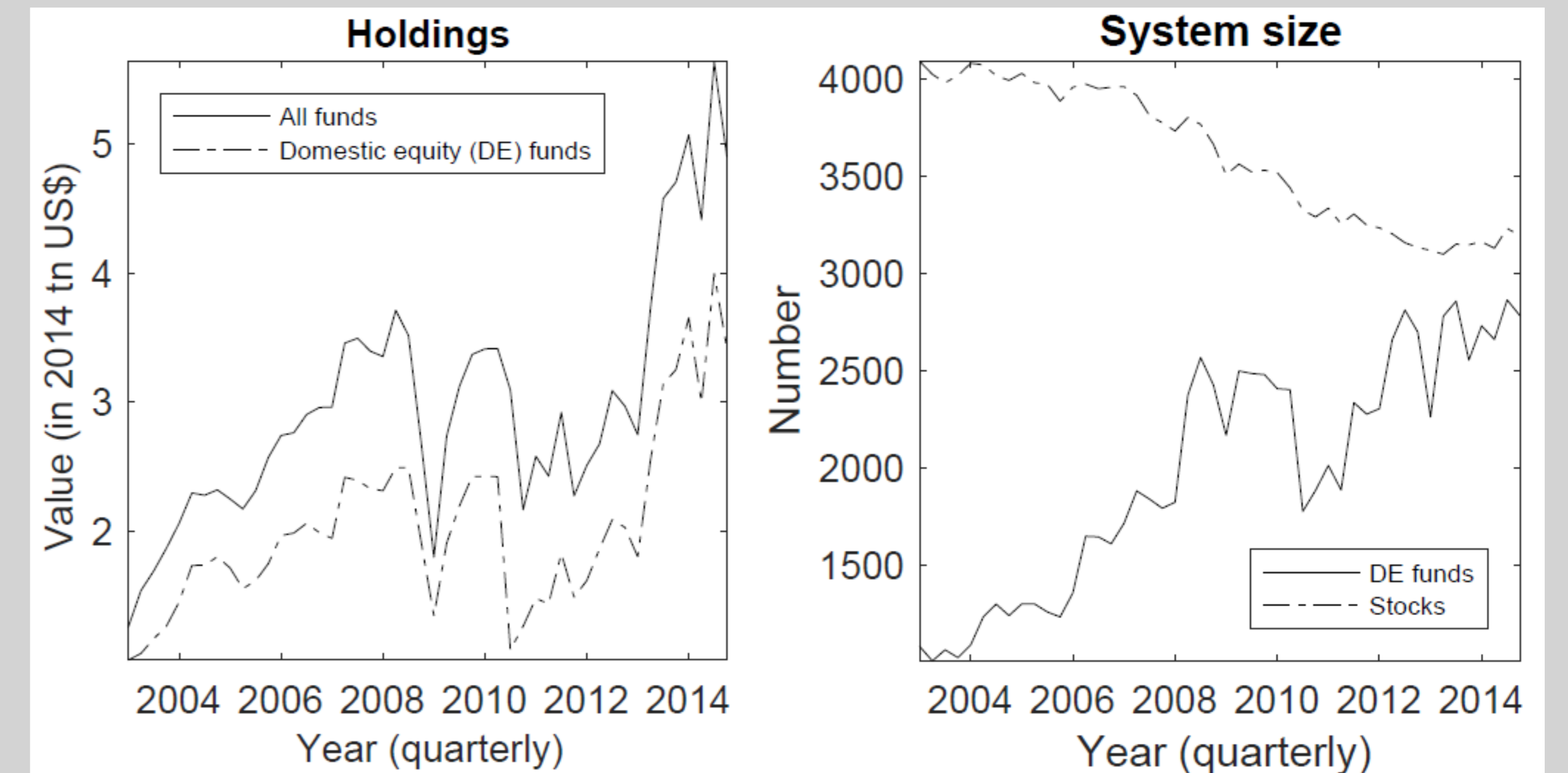
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Motivation: The asset management sector grows and becomes more concentrated



Source: Bank for International Settlements, 2014, p. 115.

Motivation: U.S. equity sector reveals comparable pattern to global developments



Question 1: Investment funds' contribution to systemic risk

1 What we do:

- Macroprudential stress-test with (i) funding fragility and (ii) fire sales
- Application to the U.S. domestic equity mutual fund sector during 2003-14

2 What we find:

- Aggregated vulnerabilities are small compared to banks

Question 2: Fund characteristics associated to systemic risk

1 What we do:

- Fund characteristics determining systemic risks
- Discuss the role of different portfolio liquidity measures

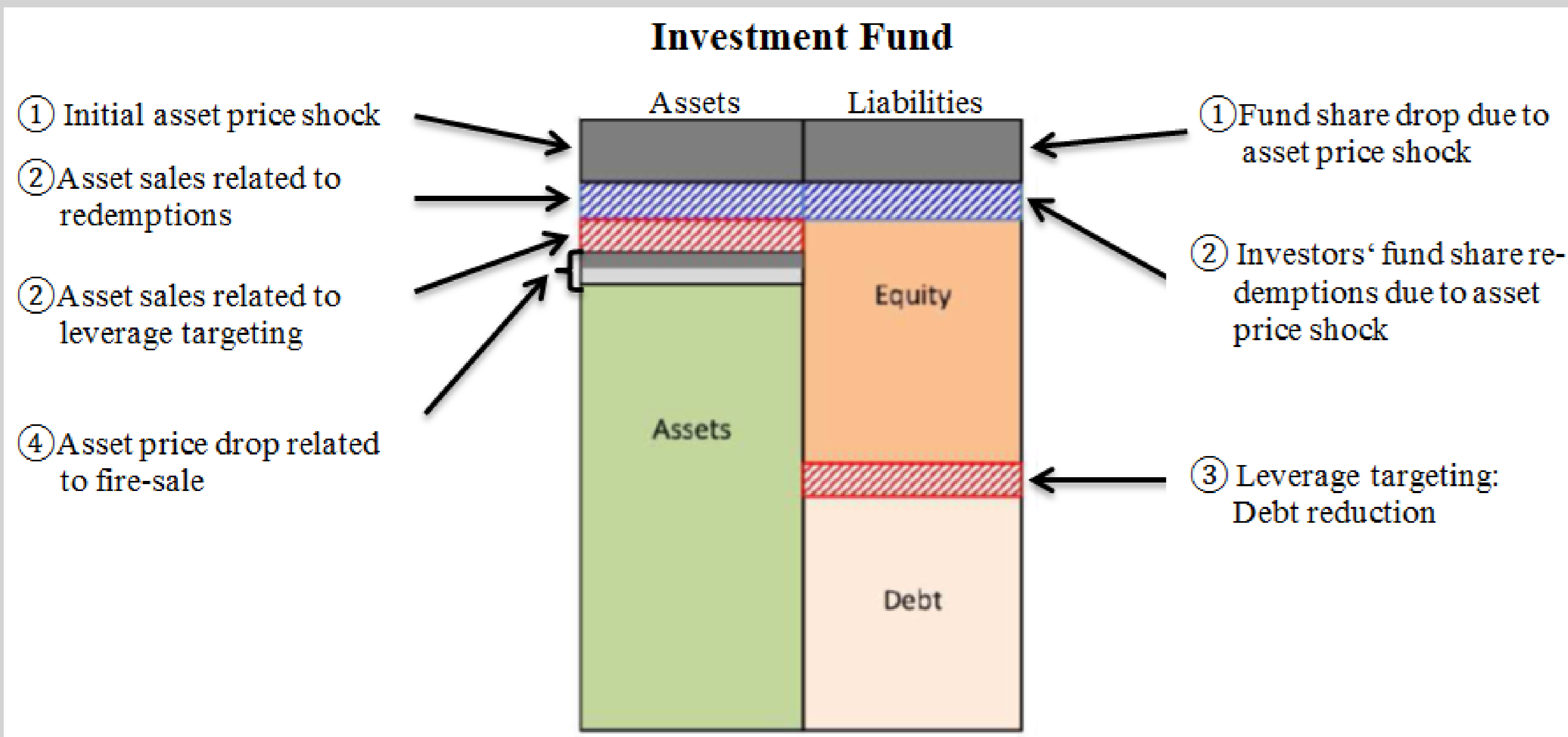
2 What we find:

- Fund-specific vulnerabilities depend on their business models
- Liquidity transformation crucial for systemic risk contribution
- Dissent between micro- and macroprudential regulators how to evaluate fund specific risk

Towards a macroprudential stress test for mutual funds

4-step stress test:

1. Initial shock on the value of funds' asset holdings, F_1
2. Investors withdraw money w.r.t. past fund returns with sensitivity γ^E (flow-performance relationship)
3. Asset liquidation decision of funds for liquidity generation and leverage targeting
4. Asset liquidations have price impact according to asset liquidity, L



Vulnerabilities to fire-sale dynamics in the fund sector

Aggregated vulnerabilities: Aggregated effect of initial asset price shock on sector-wide fire-sales relative to initial equity.

$$\bar{AV} = \frac{1'_N R_3}{E_0} = \frac{1'_N A_0 MLM' ([\Gamma^E E_1 + \Gamma^D D_1] R_1 + A_0 B \bar{R}_2)}{E_0} \quad (1)$$

Systemicness: Fund's individual contribution to system wide fire-sales.

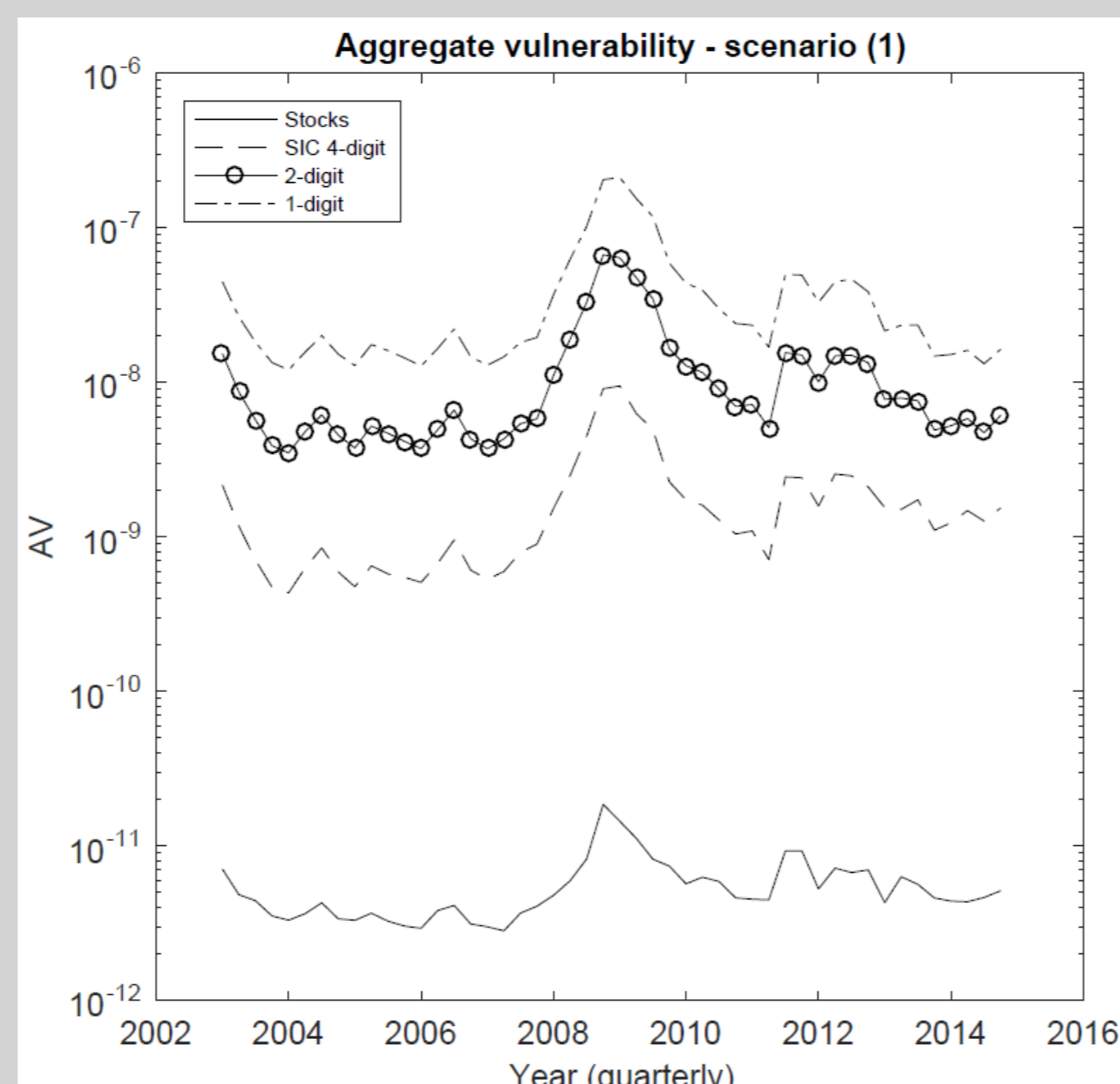
$$S_i = \frac{1'_N A_0 MLM' \delta_i \delta_i' ([\Gamma^E E_1 + \Gamma^D D_1] R_1 + A_0 B \bar{R}_2)}{E_0} \quad (2)$$

Indirect vulnerabilities: Fund i's vulnerability to other funds' asset liquidations.

$$IV_i = \frac{\delta_i' A_0 MLM' ([\Gamma^E E_1 + \Gamma^D D_1] R_1 + A_0 B \bar{R}_2)}{E_{i,i}} \quad (3)$$

Finding: Small aggregated vulnerabilities in the fund sector

1. Small vulnerabilities in the U.S. domestic equity fund sector
5% initial shock (*Step 1*) corresponds to a fire-sale of less than 1bp of funds' AuM (0.001bp)
2. Vulnerabilities covary with price impact measures
3. Results robust to several price impact measures:
 - a) Price impact time-varying and asset-specific (*Scenario 1*)
 - b) Homogeneous price impact of 4.77×10^{-6} for all assets in all quarters (*Scenario 3*)



Findings: Determinants of Fund Sector Vulnerabilities (Price Impact Time-Varying and Asset-Specific)

Model-inherent measures	Panel A		Alternative measures	Panel B	
	$\log(IV_1)$	$\log(S_1)$		$\log(IV_1)$	$\log(S_1)$
<i>Size measures</i>			<i>Size measures</i>		
$\log(TNA(t-1))$	-0.5832** (0.0541)	0.5898** (0.0548)	$\log(1+Age(t-1))$	-0.9402** (0.0197)	0.9657** (0.0160)
			Flows ^{6M} (t-1)	-0.6697** (0.2204)	0.4111* (0.2000)
<i>Diversification measures</i>			<i>Diversification measures</i>		
$\log(\text{MeanOverlap}(t-1))$	-0.3409** (0.0606)	0.1676** (0.0564)	$\log(\text{HHI}(t-1))$	0.4674** (0.0210)	-0.4995** (0.0132)
<i>Illiquidity measures</i>			<i>Illiquidity measures</i>		
$\log(\text{Illiq}^{\text{Amihud}}(t-1))$	0.0772** (0.0133)	0.3245** (0.0143)	$\log(\text{Illiq}^{\text{Spread}}(t-1))$	1.0425** (0.0370)	0.6690** (0.0444)
Fama-MacBeth	Yes	Yes	Fama-MacBeth	Yes	Yes
Mean R ²	0.561	0.536	Mean R ²	0.281	0.254
Obs.	72,872	72,872	Obs.	59,430	59,430

* p<0.05; ** p<0.01

Interpretation of findings

1. **Implications for Policy Makers:** Heterogeneous interpretation of stress test results according to policy objective (Micro- vs. Macroprudential)

	Regulator's objective	
	Microprudential	Macroprudential
Stabilization of ...	individual funds	financial system
Vulnerability indicator	IV	S

Variable	Interpretation of findings	
Fund Size	↓	↑
Diversification level	↓	↑
Portfolio illiquidity	↑	↑

Fund's liquidity transformation contributes to systemic risk

2. **Implications for stress-test set-up:**

- Include further fund types to achieve a system-wide stress-test
- Liquidity assumption essential for accurate vulnerability estimation

Distortion effect of homogeneous price impact assumption

Homogeneous price impact (IV_3 / S_3) results in economic meaningful lower vulnerabilities of the least liquid funds (*Decile 10*), compared to vulnerabilities derived from time-varying price impact parameters

- Least liquid funds (*Decile 10*) above solid line
- Most liquid funds (*Decile 1*) below solid line

