



MISALLOCATION OR RISK-ADJUSTED CAPITAL ALLOCATION

BY J. DAVID, LUKAS SCHMID, AND D. ZEKE

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Question

- How much of variation in MPK due to risk?
- DSZ's answer: $\approx 30\%$



Why Important?

- MPK dispersion usually attributed to misallocation
- But, “distortions” are just nonstructural wedges



Contributions of DSZ

- Provides factor to account for dispersion of MPK
- Moves toward connecting macro and finance



Source of 30% Result

- Use standard Euler equation:

$$\begin{aligned}1 &= E_t M_{t+1} (MPK_{i,t+1} + 1 - \delta) \\ &= E_t M_{t+1} (\theta X_{t+1}^{\beta_i} Z_{i,t+1} K_{i,t+1}^{\theta-1} + 1 - \delta)\end{aligned}$$

- With some algebra, can show:

$$\begin{aligned}E_t mpk_{i,t+1} &= \alpha_t + \beta_i \gamma(x_t) \sigma_\epsilon^2 \\ &\Rightarrow \sigma_{E_t[mpk]}^2 = (\sigma_\beta \gamma(x_t) \sigma_\epsilon^2)^2\end{aligned}$$

where X is aggregate TFP and ϵ is its innovation



Source of 30% Result

$$\sigma_{E_t[mpk]}^2 = (\sigma_\beta \gamma(x_t) \sigma_\epsilon^2)^2$$

- Little variation in aggregate TFP, e.g., $\sigma_\epsilon = .007$
 - \Rightarrow Tiny $\sigma_\epsilon^4 = 2.4 \times 10^{-9}$
 - \Rightarrow DSZ need risk-sensitive investors and large σ_β



My Discussion

- Why are high MPK companies more risky?
- How accurate is DSZ's measure of capital?
- What are implications for the macroeconomy?



Why are high MPK companies risky?

- Premise of paper is MPK dispersion due to risk
 - But, DSZ missing Fama-French like narrative
 - Is DSZ's new risk factor just picking up size?

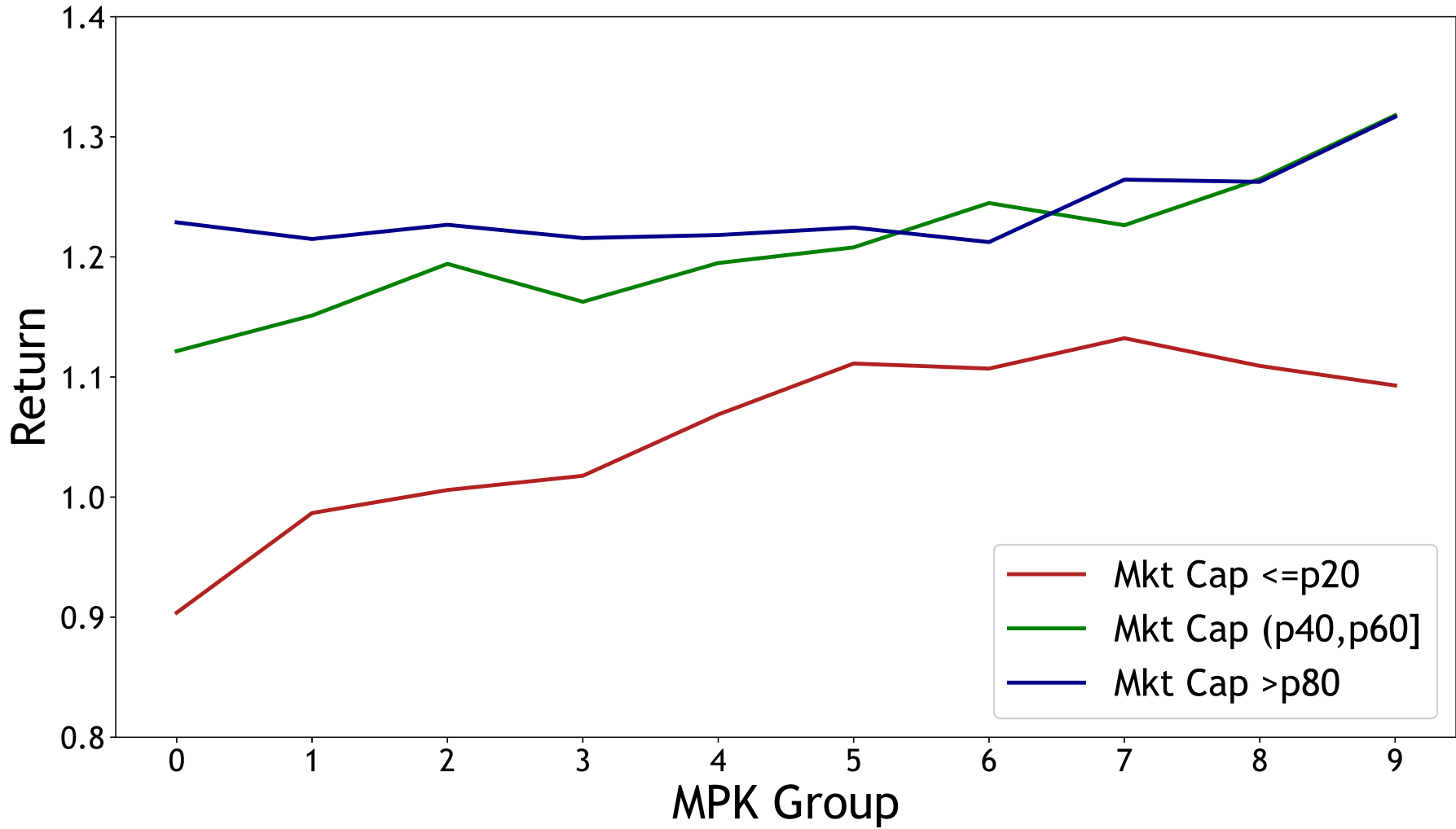


Sort Companies by MPK and Size

- Consider sorting firms
 - First by market capitalization (size)
 - Then by DSZ's proxy for MPK
- What are the annual returns?



Returns: MPK vs Size



Punchline: Most of dispersion in small cap firms



DSZ's Measure of Capital

- Compustat's PPENT:
 - Measures book not reproducible capital
 - Misses intangibles



BEA Comprehensive Revision 2013

- *Intellectual property products* investment included:
 - R&D
 - Artistic originals
 - Software (first introduced in 1999)
- While much investment still missing, category is large...



BEA Comprehensive Revision 2013

- Private fixed nonresidential investment, 2012

22% Structures

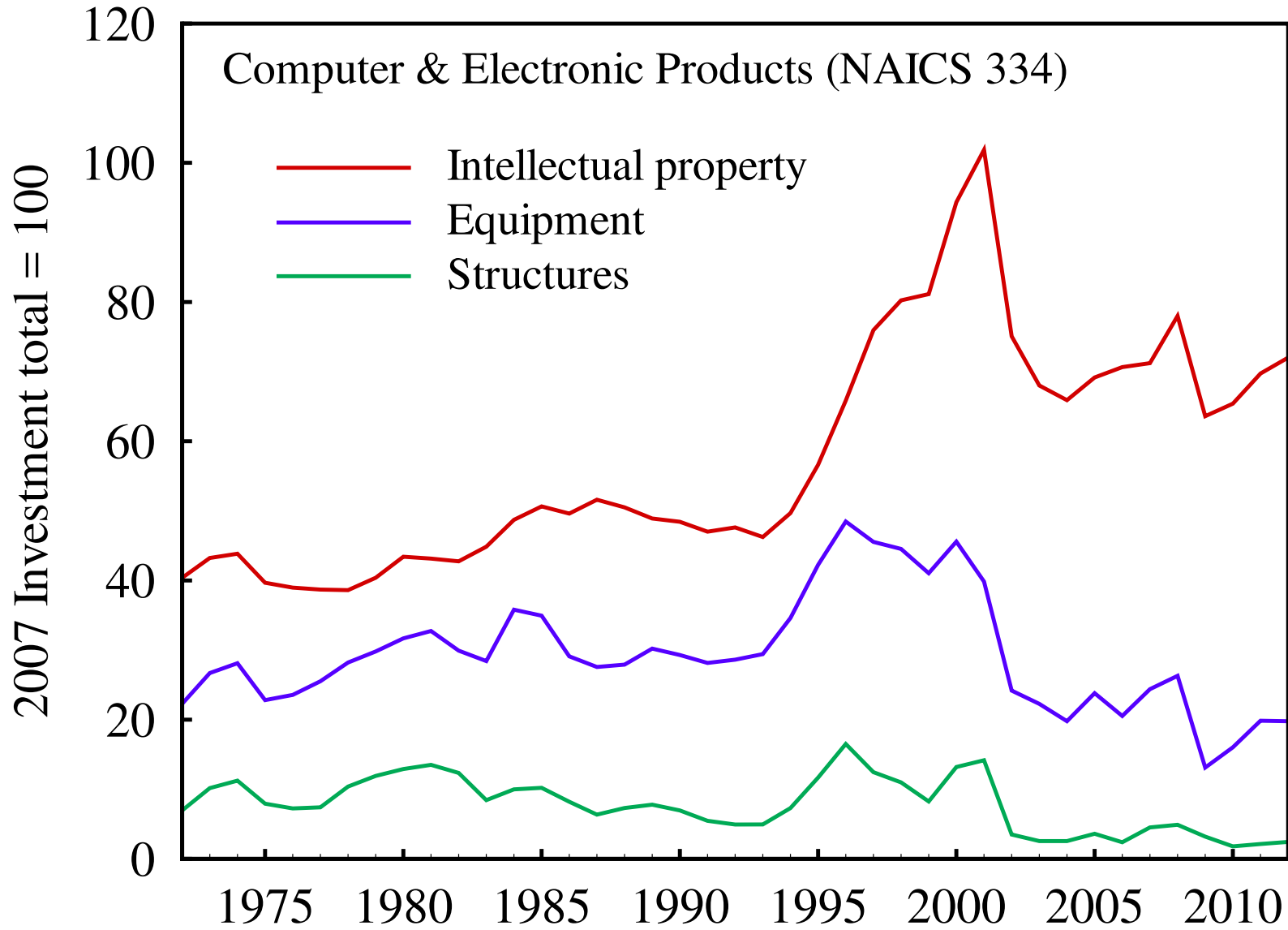
45% Equipment

33% Intellectual property

- Also have data for detailed industrial sectors

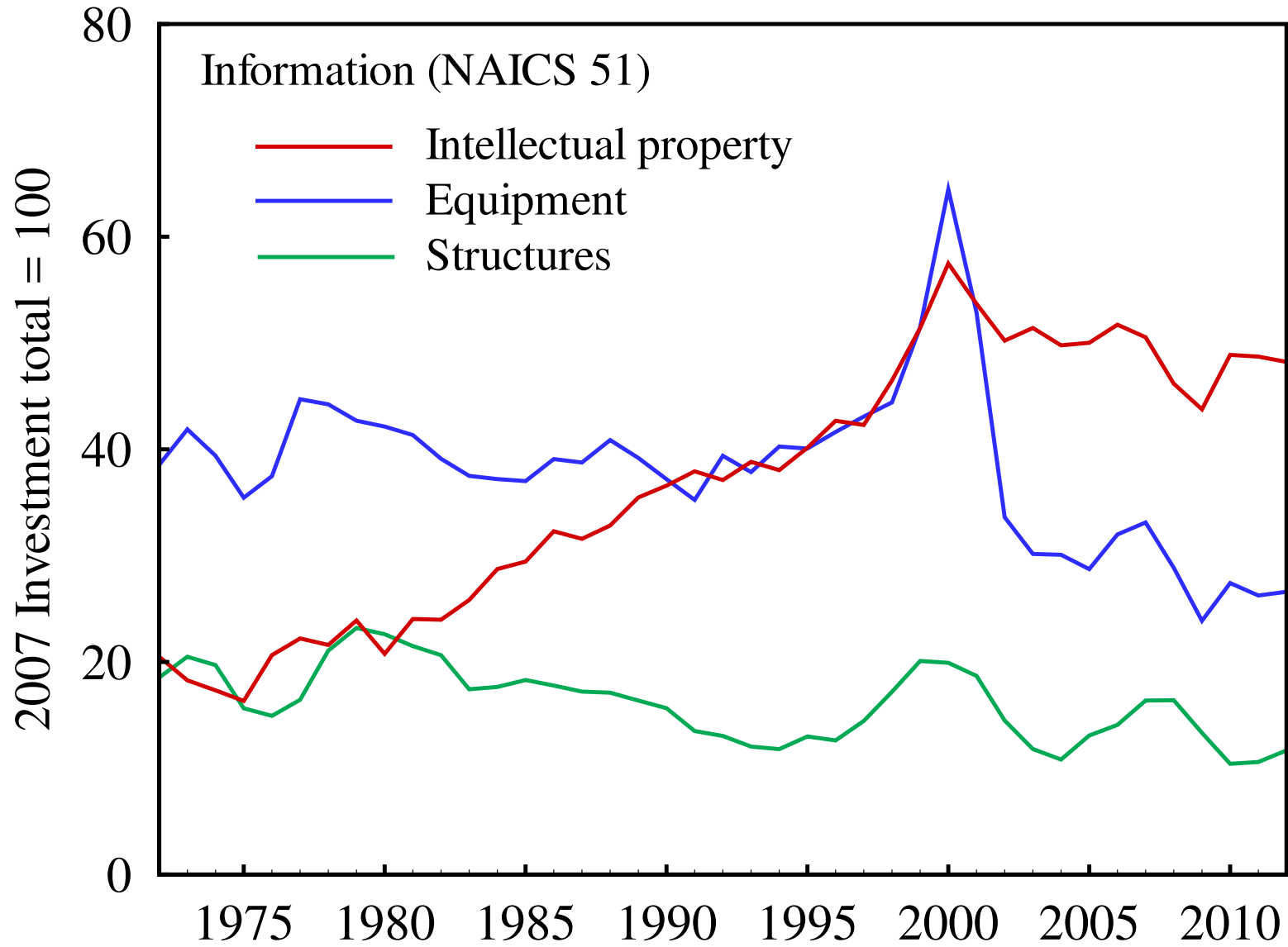


Computer & Electronic Products





Information



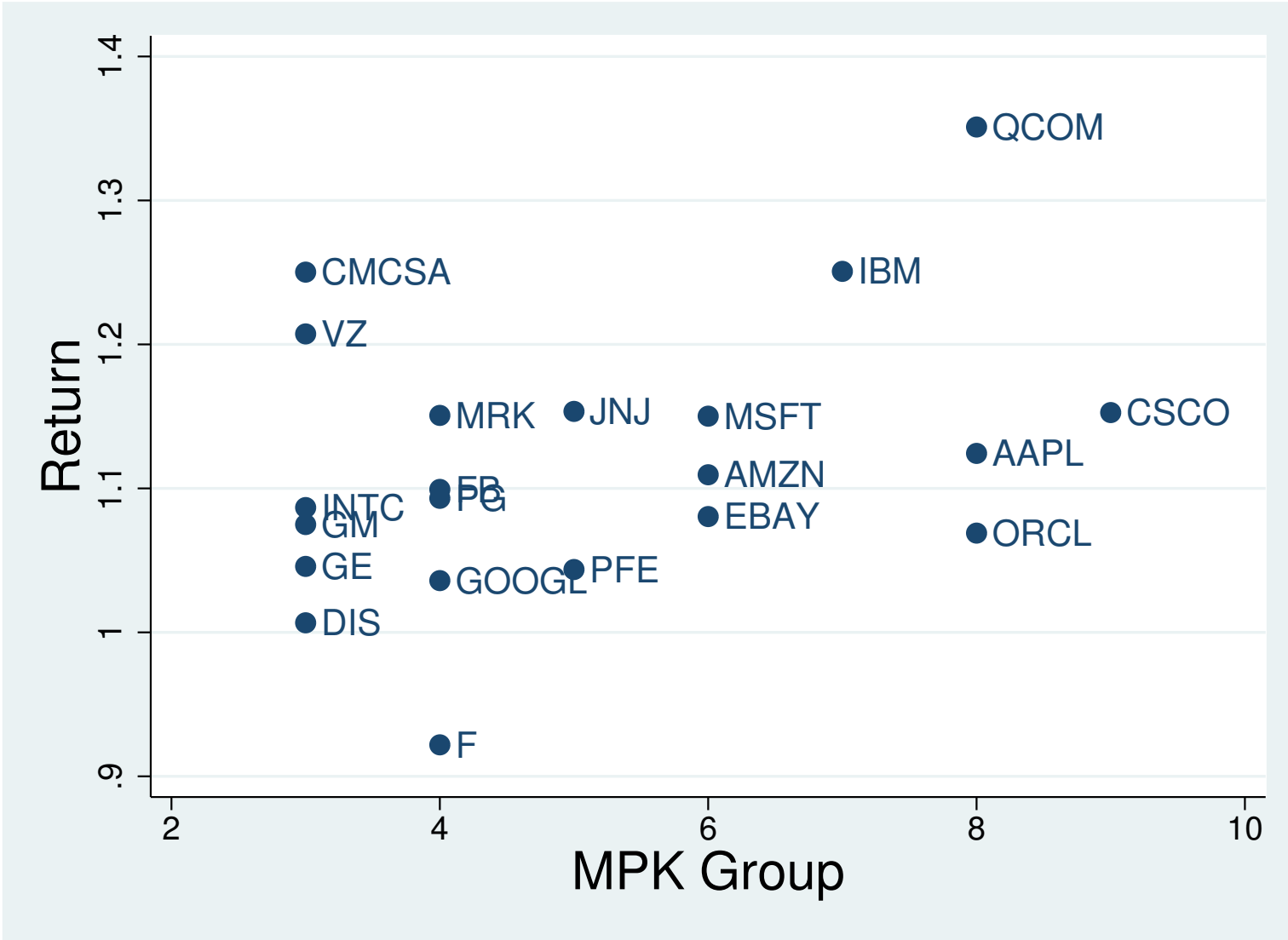


Intangible-Intensive Companies

- Consider large companies by
 - R&D spending
 - Brand building
- Any systematic variation in MPKs and returns?



MPK vs returns: Some Examples



Punchline: No pattern



Implications for Macroeconomy

- 500 largest firms account for most of NIPA value added
- What if DSZ restrict attention to these?



Recap

- Questions for DSZ:
 - Why are high MPK companies more risky?
 - How accurate is DSZ's measure of capital?
 - What are implications for the macroeconomy?