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What is a Company Really Worth? The Role of Internally-Produced Intangibles

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Economic Research on Intangible Assets Has Found That They Are Important Drivers of Economic Growth and Corporate Wealth

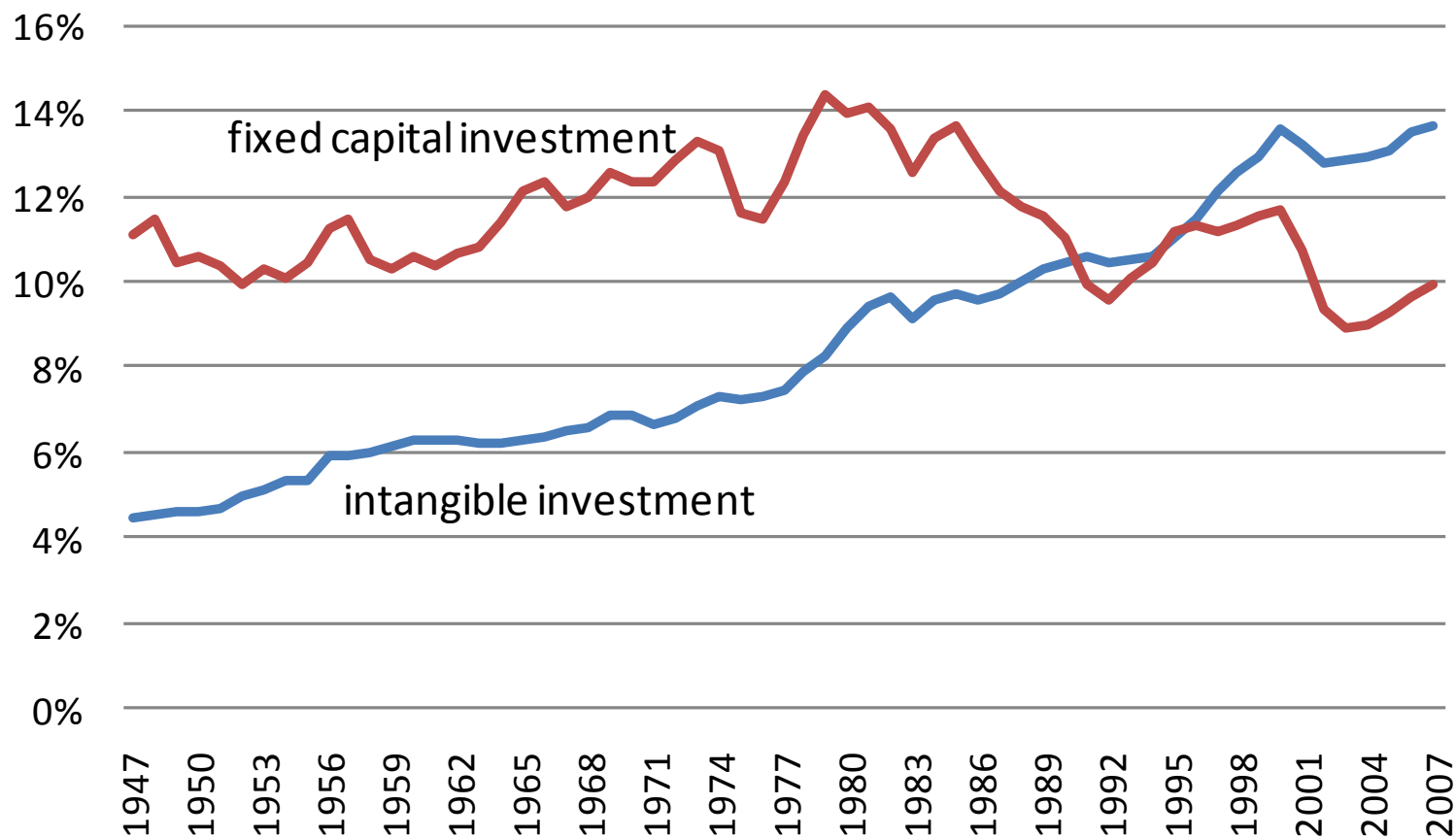
■ Macro intangibles

- ◆ Nakamura (1999, 2000)—intangible investment was \$1 trillion a year.
- ◆ Corrado, Hulten, Sichel (2009)—intangible assets contributed to one quarter of growth from 1995 to 2003.
- ◆ International comparison of sources of growth (Marrano, Haskel and Wallis, 2009, Fukao et. al. 2009, van Ark et al. 2009).

■ Firm-level analysis

- ◆ Lev (2001)-called attention to intangible assets as a solution of price-book gap.
- ◆ Hulten and Hao (2008)-reported results of intangibles on price-book gap.
- ◆ Hulten (2010)- study of Microsoft show company is virtually all intangibles, both as inputs and outputs.

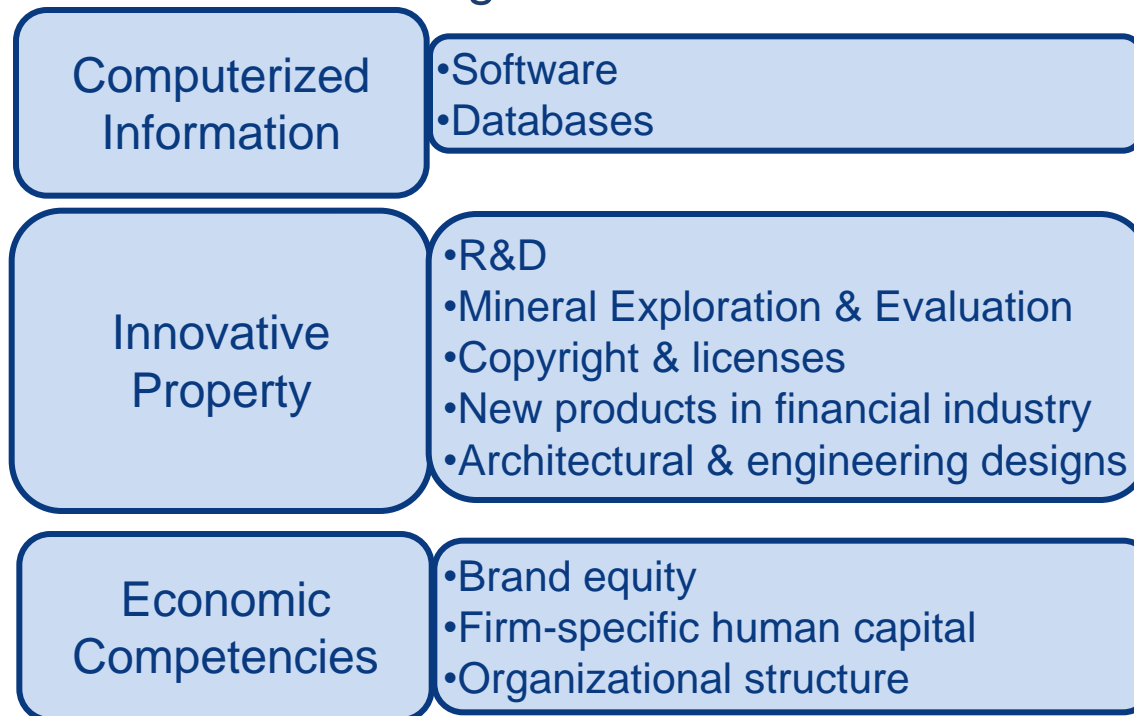
One indication of how important intangibles are for US non-farm business sector: More has been invested in intangible assets than tangible assets in recent years (as % of output)



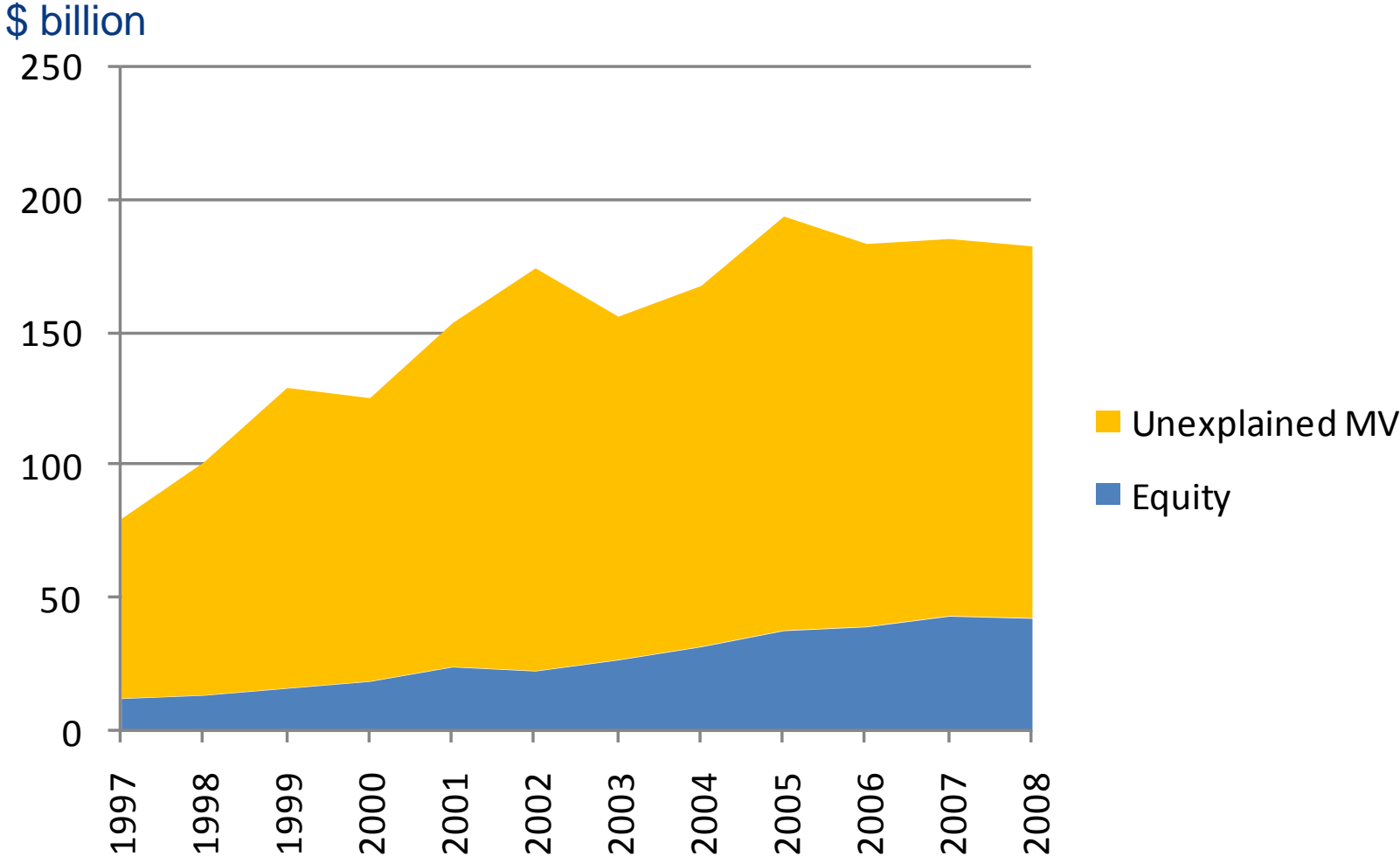
Source: Corrado and Hulten (2010).

Intangibles

- When we use the term “intangibles”, we mean the within-company expenditures on product research and development, marketing and brand equity, and organization development.
- Unlike intangibles reported on the company’s books, these internal outlays are treated as costs on financial statements and not as investments.
- CHS classification of intangibles:



Another Dimension of Intangible Assets: They can fill the price-to-book gap. Here is the case of Johnson & Johnson



Source: Johnson & Johnson annual reports, various years.

Our Method

- Hulten and Hao (2008), What is a Company Really Worth? Intangible Capital and the “Market to Book Value” Puzzle. NBER wp14518.
- Use Johnson & Johnson as an example.
- Data source: Compustat (10-Ks from 1989 to 2008).
- Estimate R&D Capital.
 - use R&D costs.
 - $\text{R\&D capital in } t = \text{R\&D capital in } (t-1) + \text{R\&D investment in } t - \text{R\&D amortization in } t.$
 - Depreciate over 10 years.
- Estimate organizational capital.
 - use about 30% of SG&A costs and varies across years. Estimate the fraction using data from CHS (2005).
 - $\text{Org Capital in } t = \text{Org Capital in } (t-1) + \text{Org investment in } t - \text{Org Capital amortization in } t$
 - Depreciate over 5 years.

When Internally-developed Intangibles are Capitalized:

- Intangible assets account for 61% of total assets of Johnson & Johnson in 2008.
 - Internally developed intangible assets amount to 7 times purchased intangible assets.
- After we capitalize intangible spending,
 - earnings per share increase from \$4.62 to \$7.37.
 - debt-to-equity ratio decreases from 1.00 to 0.31.
 - return on equity ratio decreases from 0.30 to 0.15.
- Intangible assets contribute to the value of a firm substantially.
 - the percentage of market value explained by equity increased from 23% to 76%.

Modified Income Statement

Johnson & Johnson 2008

\$billions	10-K	+R&D K	+ORG K
Conventional Revenues	63.7	63.7	63.7
Own production of R&D	0	11.1*	11.1*
Own prod. of Org. Capital	0	0	8.9*
Adjusted Value of Product	63.7	74.8	83.7
Conventional cost of sales	15.7	15.7	15.7
Current R&D costs	7.8	7.8	7.8
Current SG&A costs	21.3	21.3	21.3
Total current costs	44.7	44.7	44.7
Operating Surplus	19.0	30.1	39.0
Conventional depreciation	2.8	2.8	2.8
Amort. of own-account R&D	0	5.4*	5.4*
Amort. of own-account org K	0	0	6.9*
Adjusted operating surplus	16.2	21.8	23.9
Net interest and other adjust.	0.8	0.8	0.8
Before-tax income	16.9	22.6	24.6
Income tax paid	4.0	4.0	4.0
After-tax income	12.9	18.6	20.6
Earning per share	4.62	6.63	7.37

*Our estimates of
intangibles are in red.



Modified Balance Sheet

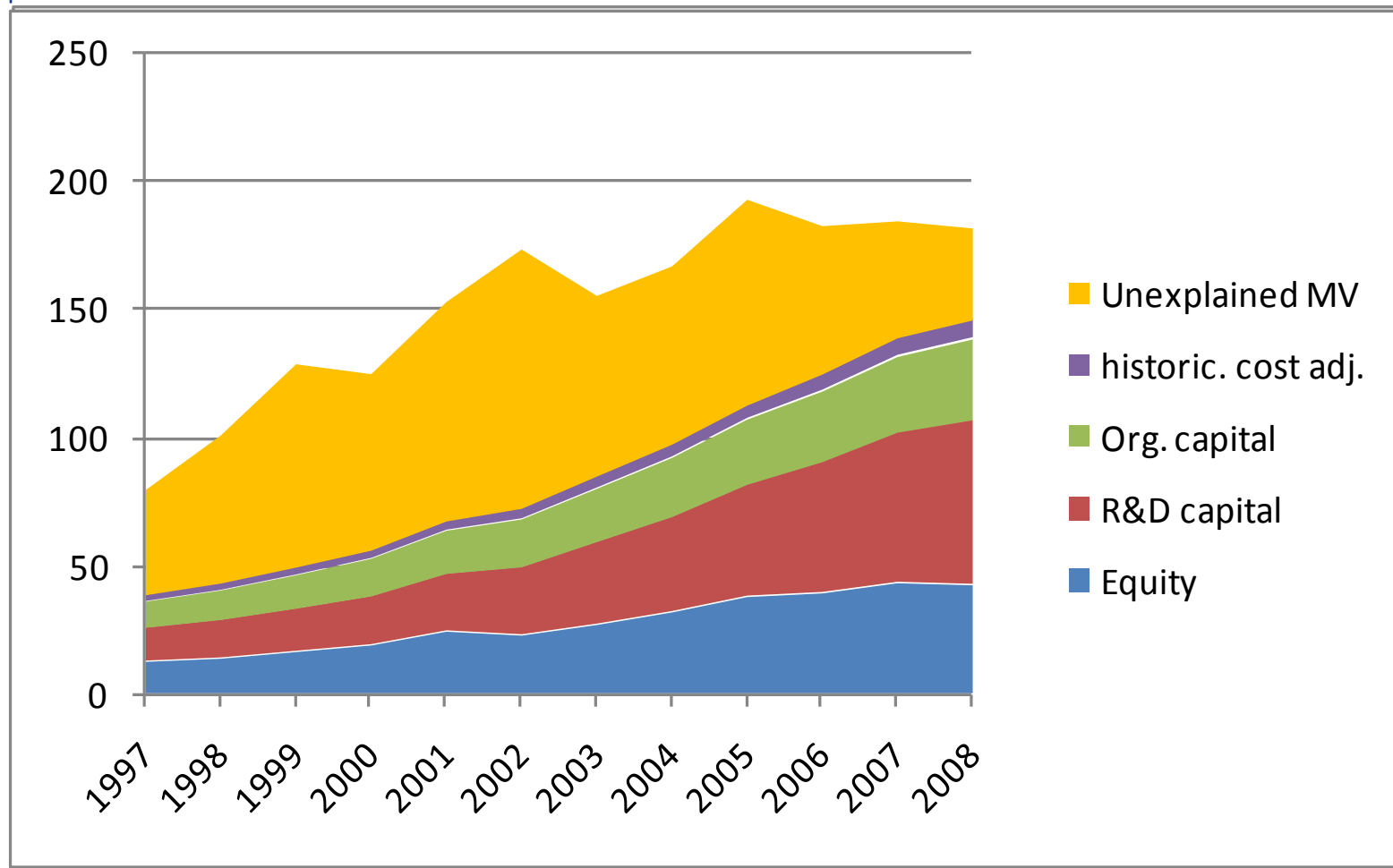
Johnson & Johnson 2008

\$billions	10-K	+R&D K	+ORG K
Current assets	34.4	34.4	34.4
Plant and equipment	14.4	14.4	14.4
Purchased intangibles	14.0	14.0	14.0
Goodwill	13.7	13.7	13.7
Other long-term assets	8.5	8.5	8.5
Total assets	84.9	84.9	84.9
Total liabilities	42.4	42.4	42.4
Equity	42.5	42.5	42.5
R&D capital	0	64.4*	64.4*
Organizational capital	0	0	31.8*
Assets adj. for own intang.	84.9	149.3	181.2
Equity adj. for own intang.	42.5	106.9	138.8
Market value of equities	181.9	181.9	181.9
% Market value explained	23%	59%	76%
Debt-to-equity ratio	1.00	0.40	0.31

*Our estimates of intangibles are in red.

Adding Intangibles to J&J Books Fills Price-to-Book Gap

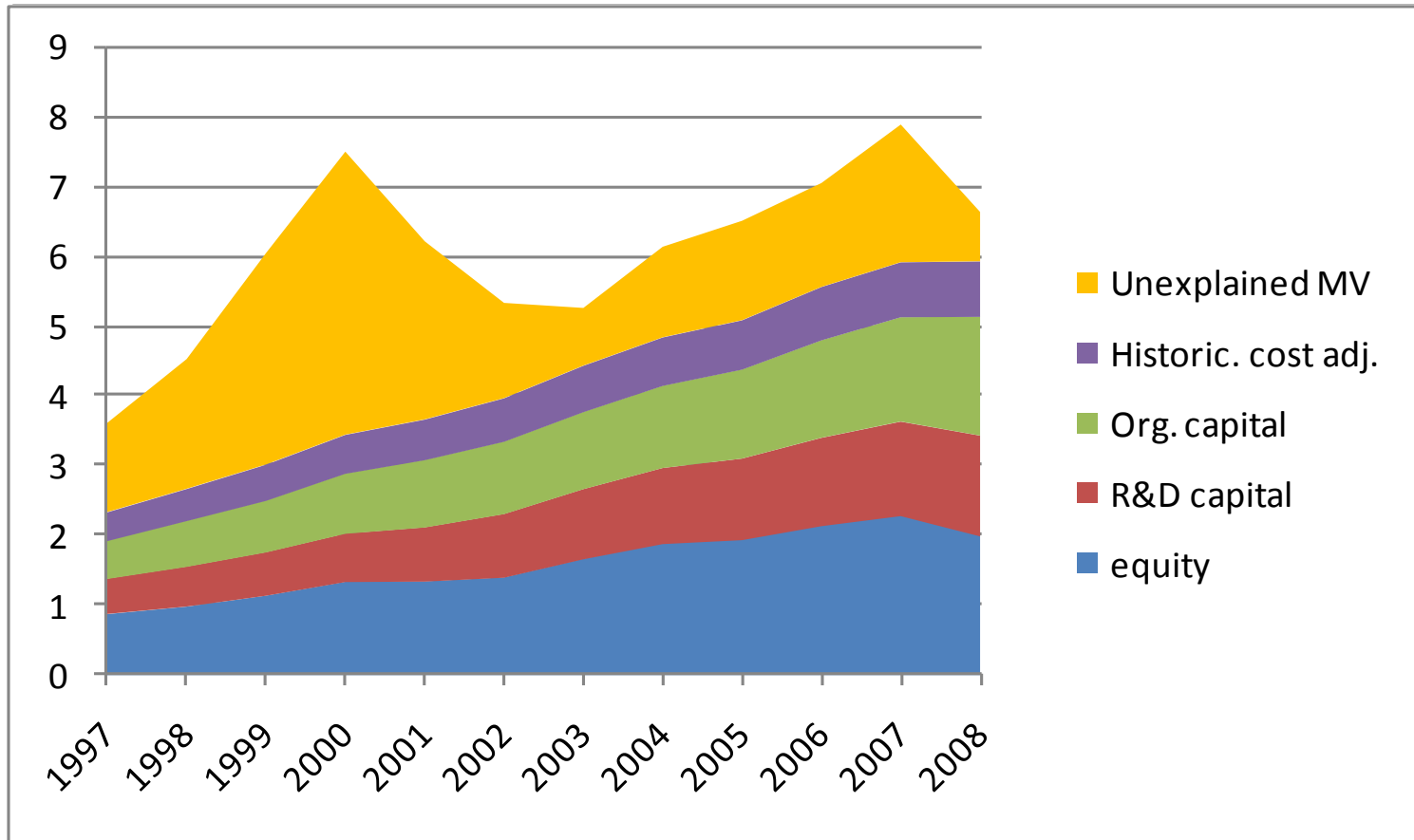
\$ billion



Source: Johnson & Johnson annual reports, various years.

Decomposition of Market Value of 633 R&D Intensive Firms

\$ trillion



Source: unpublished updates to Hulten & Hao (2008).

Conclusion

- Internally-produced intangible assets are an important source of company value.
- They are hard to measure precisely, and are not capitalized on financial statements.
- Keynes: “It is better to be imprecisely right than precisely wrong.”

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