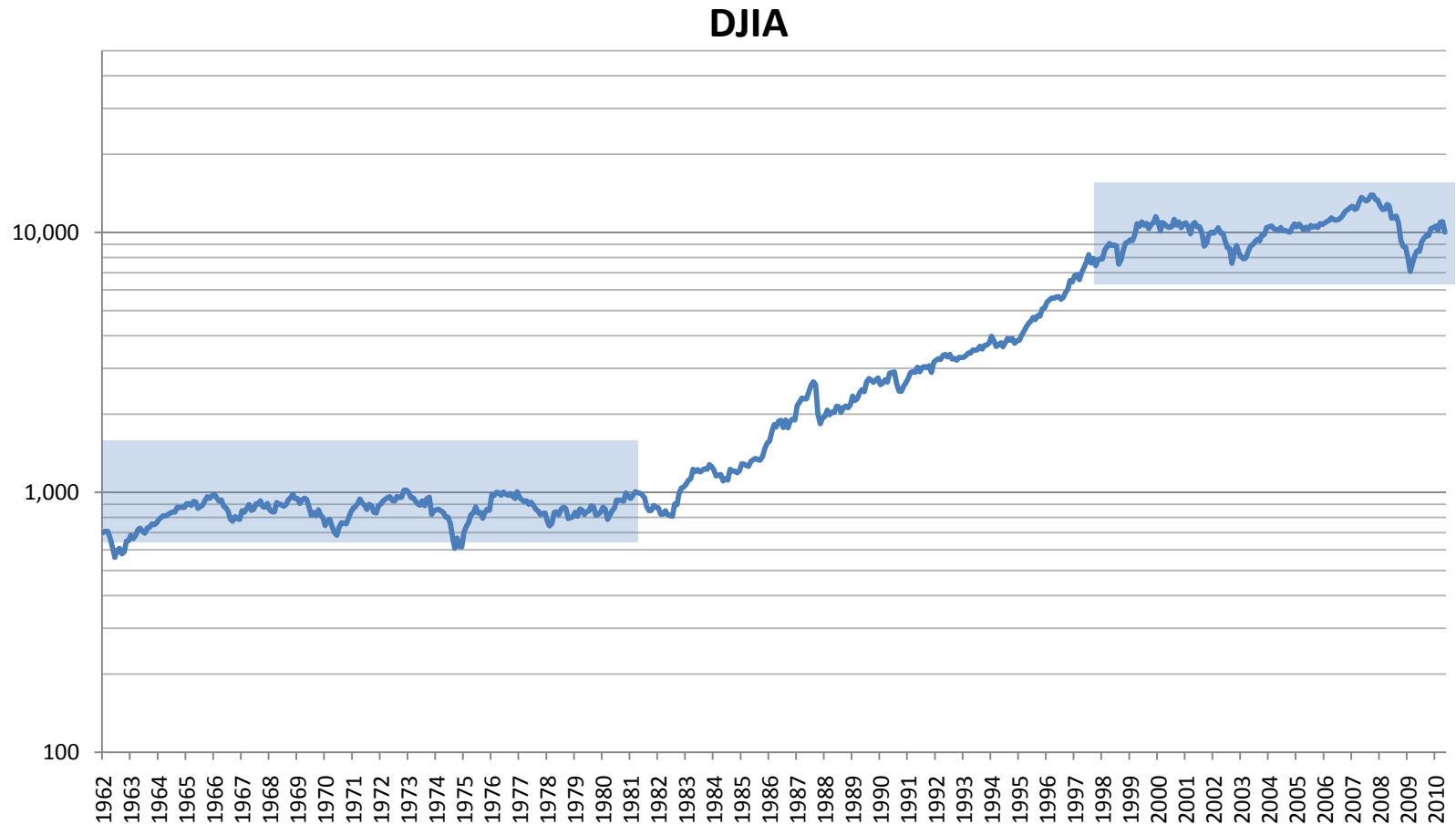


Performance of Dow Jones Industrial Average: micro and macro-level analysis

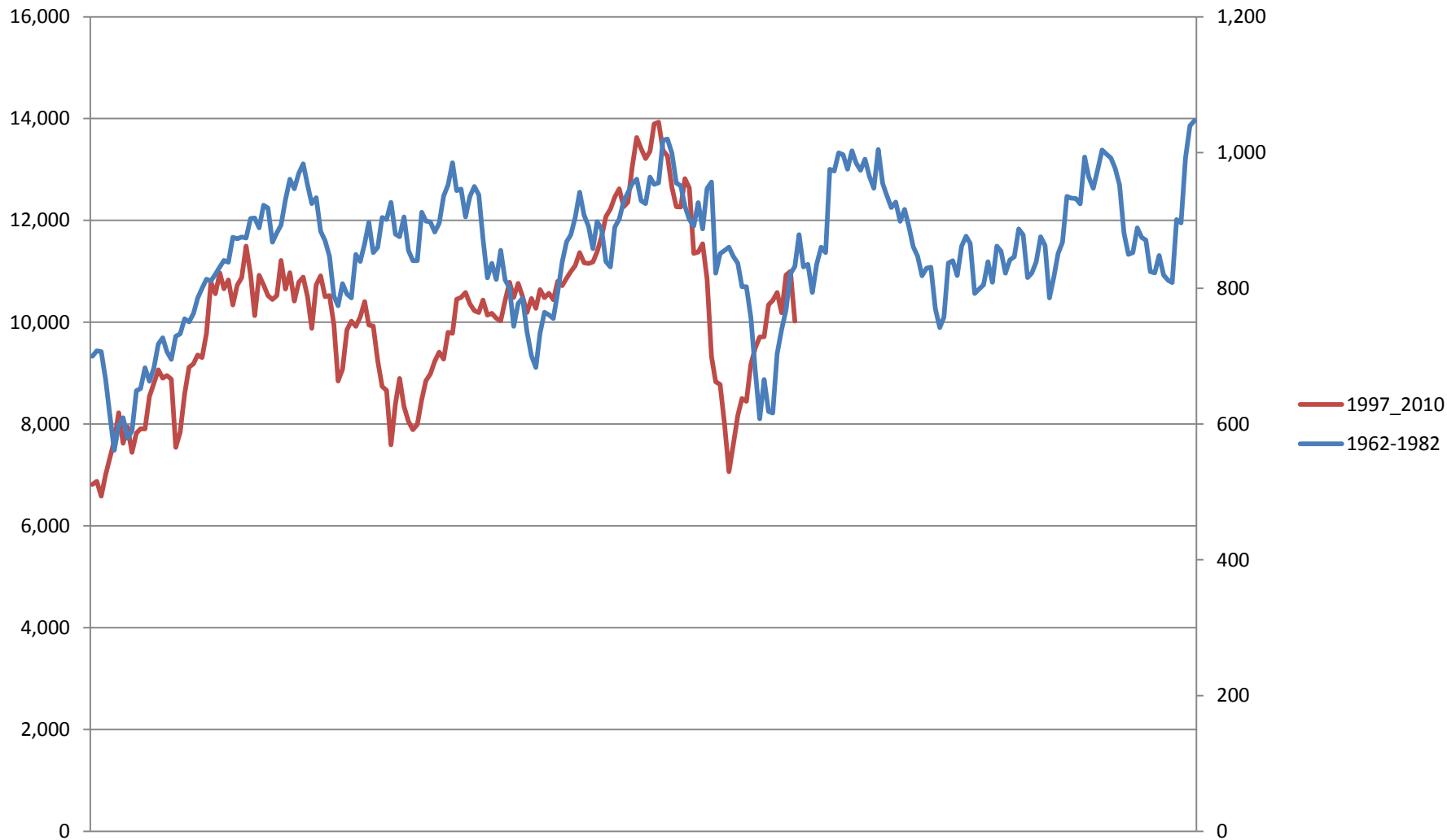
Luis Palacios
Rabih Moussawi
Denys Glushkov
Bob Zarazowski

Motivation

Dow tends to hover around 1,000 and 10,000 thresholds for some time. Is it psychological anchoring of investors or there are fundamental explanations behind it?



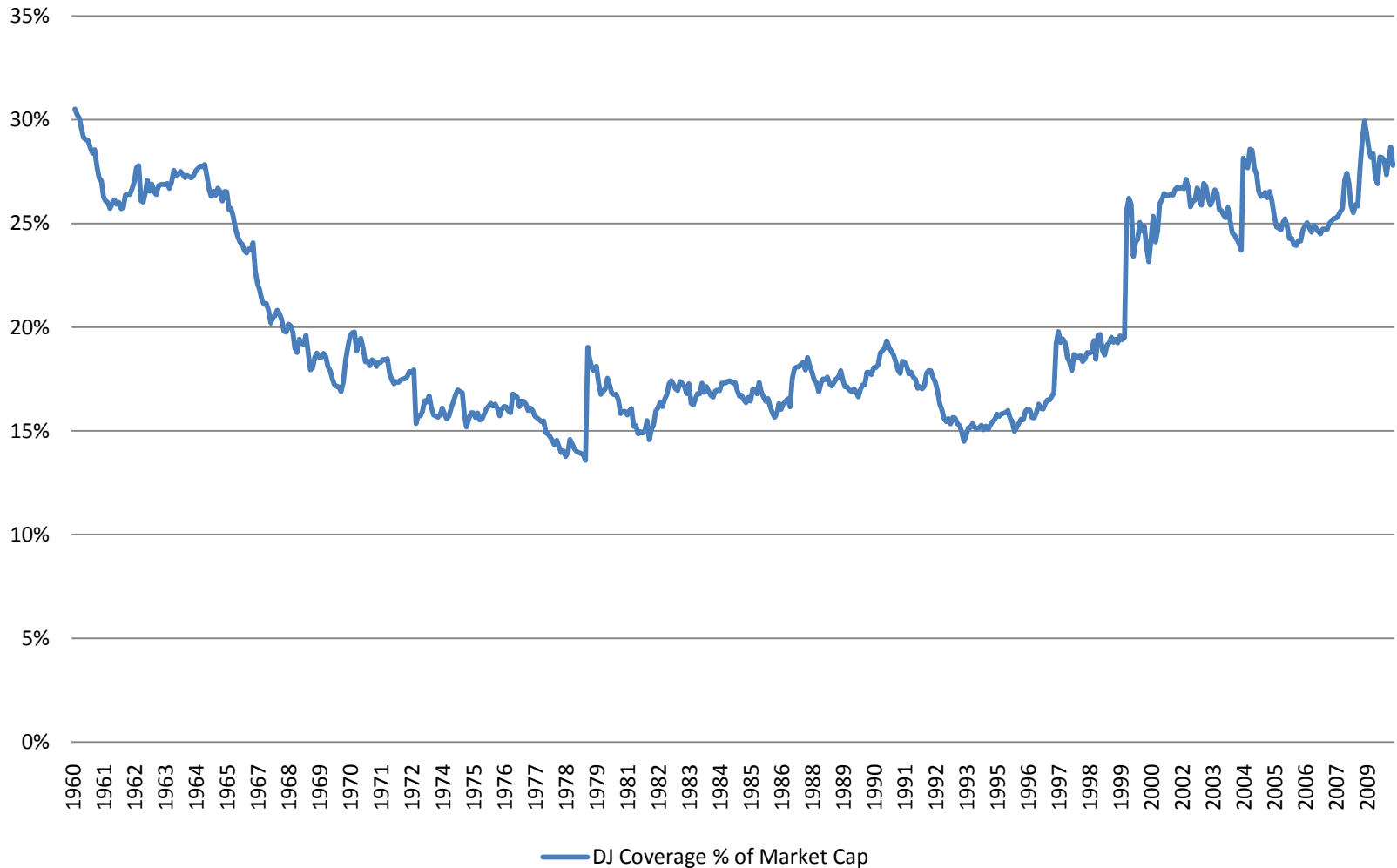
Overlaying 1966-1982 DJIA performance with 1997-2010



Micro approach: DJ constituents

- Pretty impressive coverage in terms of fraction of the entire market cap, ~20%

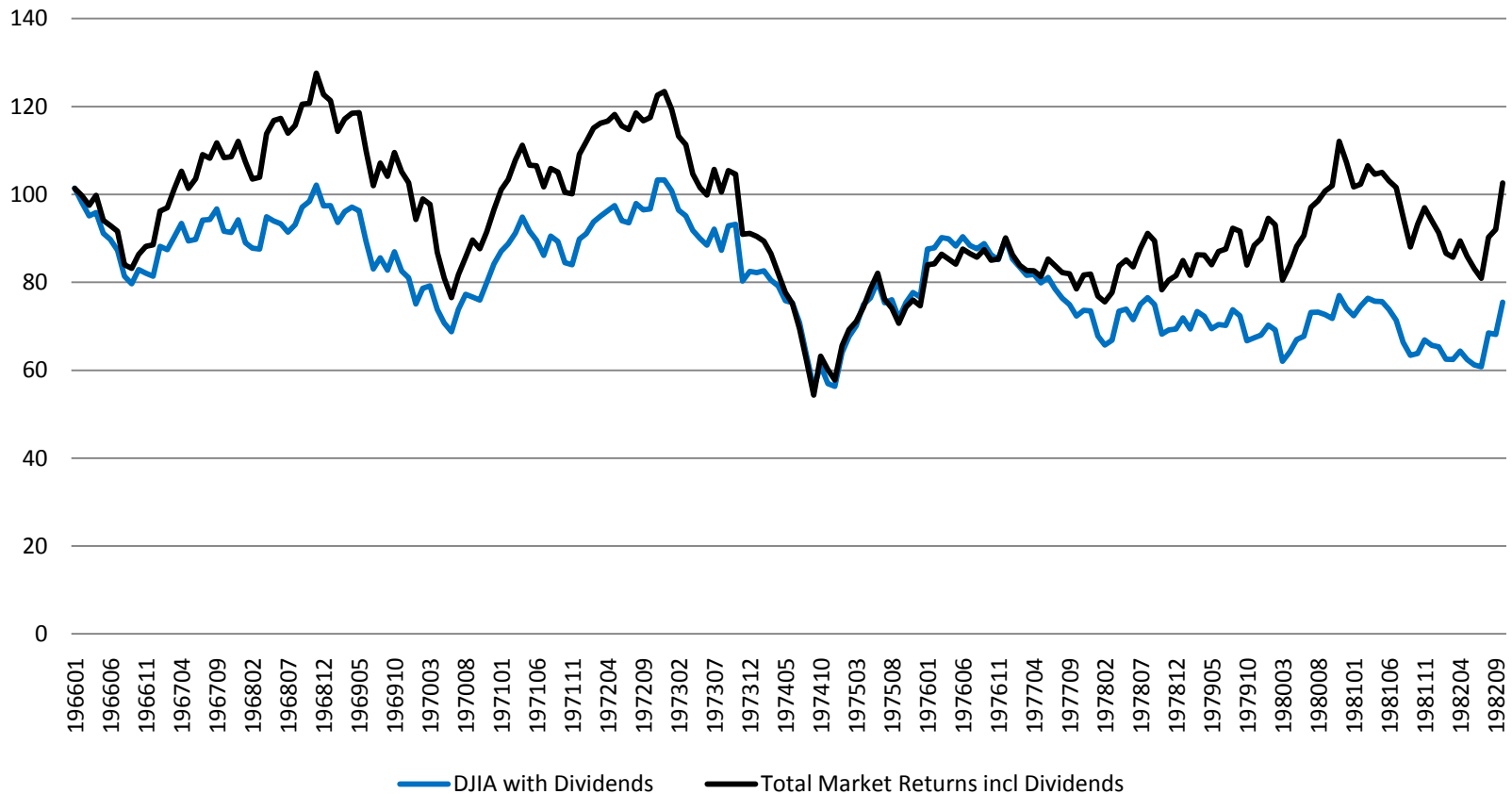
Dow Jones Coverage as % of Total Equity Market Capitalization



Performance of DOW vs total stock market

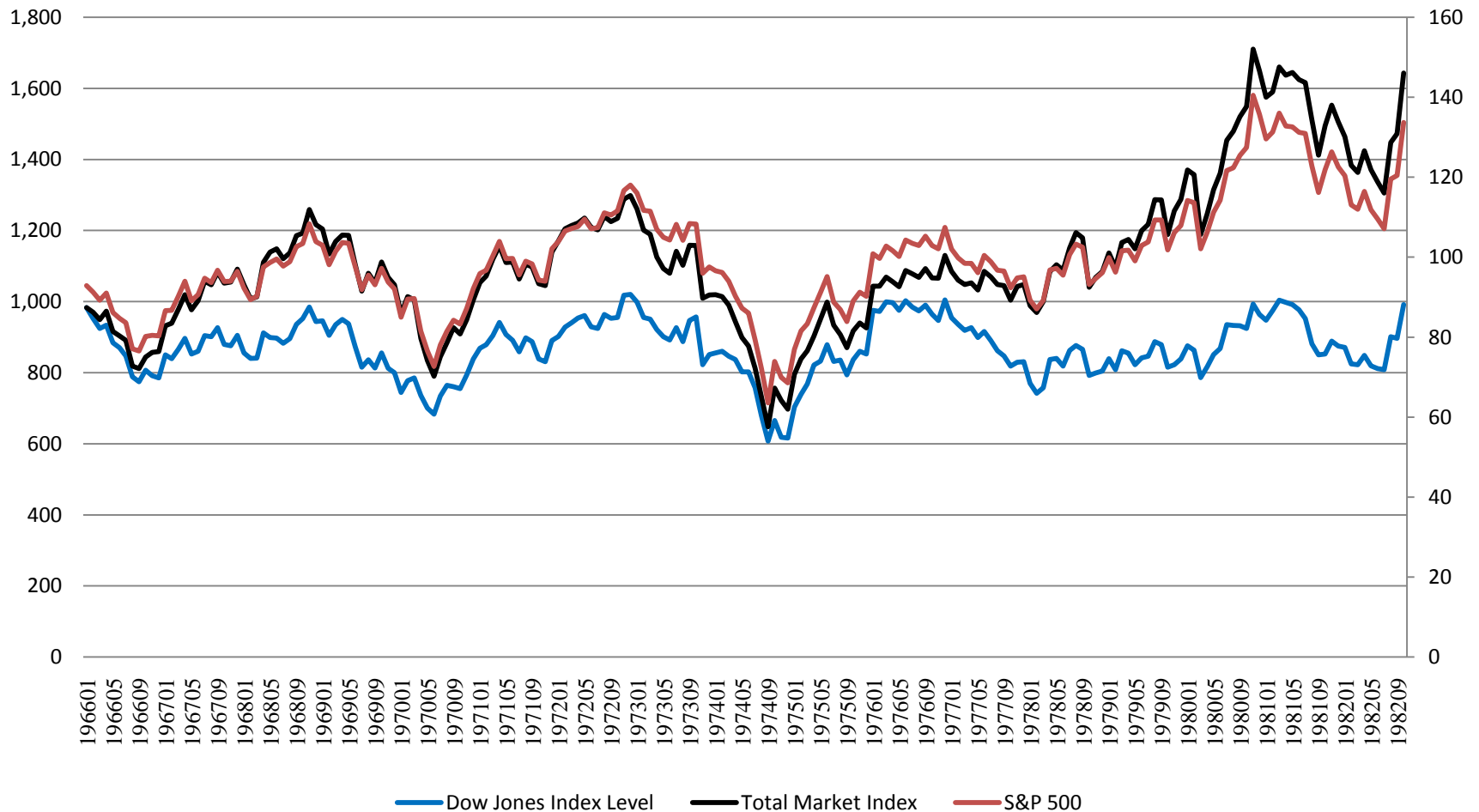
- How good was DJ composition reflective of the overall US economy over time? DJIA returned less than the overall market, especially during 1977-1982 period.

\$100 Buy and Hold DJIA vs Total Equity Market
based on real returns incl. dividends (adjusted for inflation)



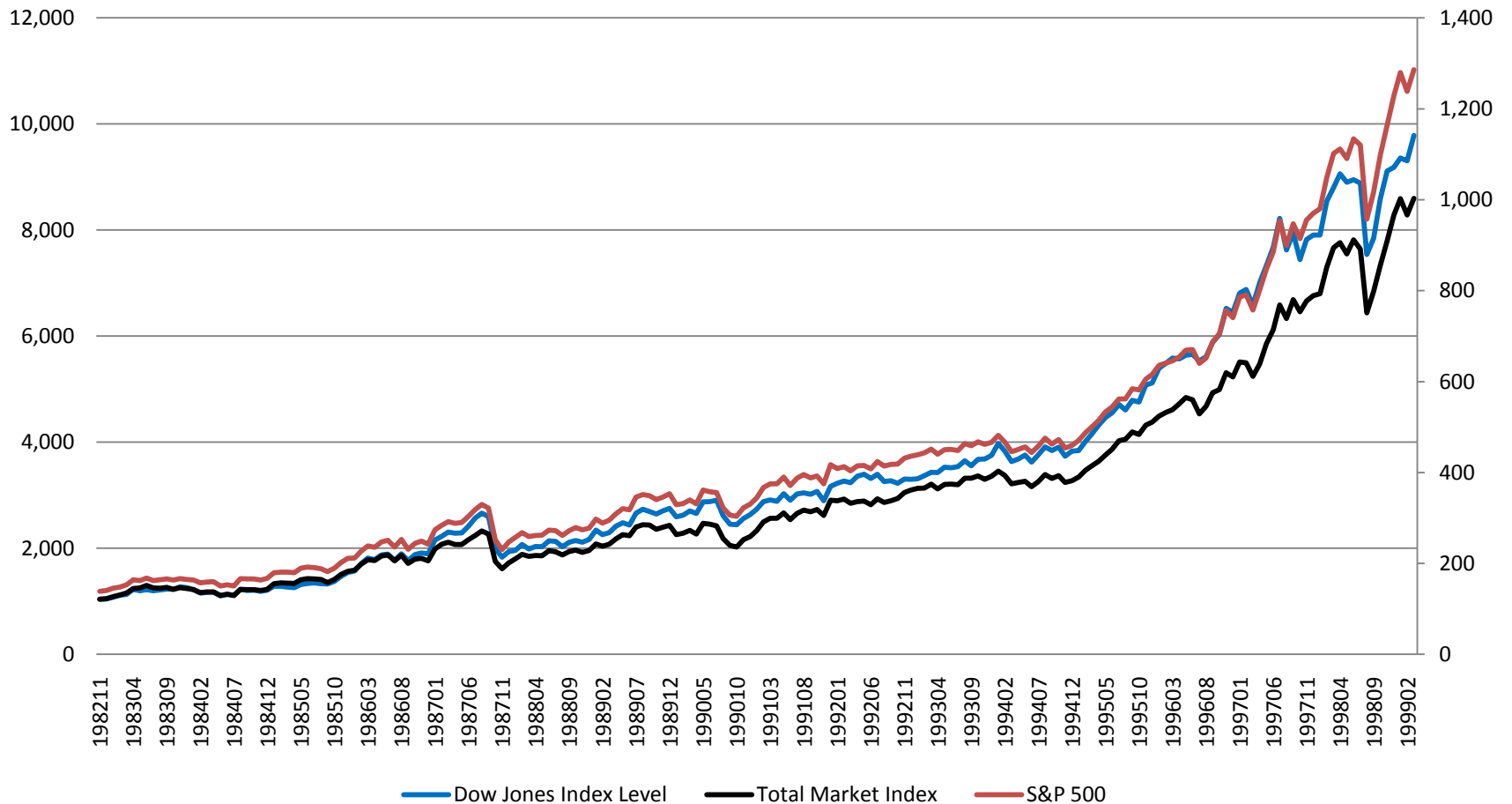
S&P appears to be more reflective of the overall market performance

Performance of Dow Jones versus Total Market Index vs SP500, levels (Excluding Dividends reinvestment and inflation adjustment) 1966-1982



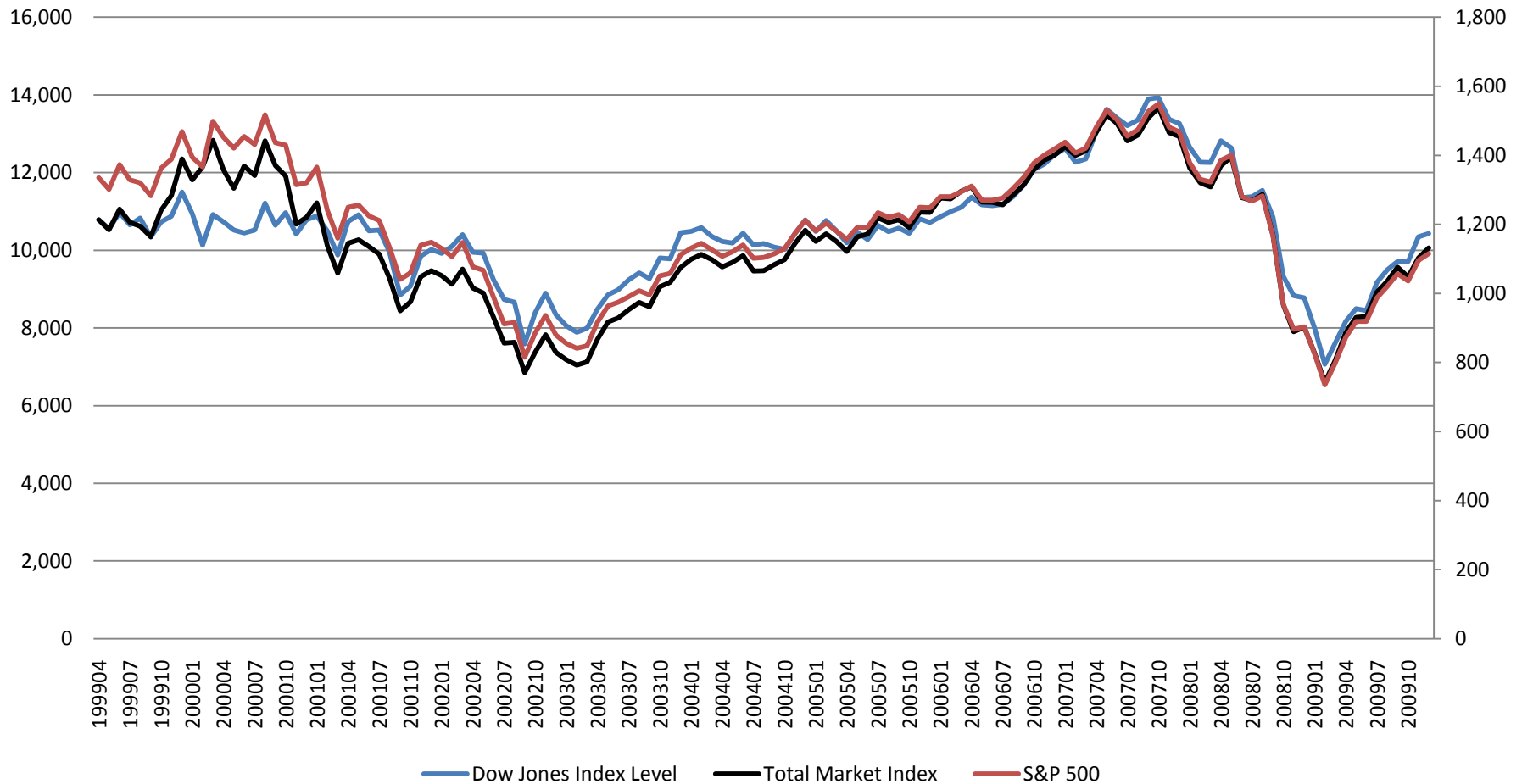
Much more aligned later due to better representation of key industries of the economy

Performance of Dow Jones versus Total Market Index (Excluding Dividends reinvestment) 1982-1999



Dow as better gauge of overall market performance in the most recent period

Performance of Dow Jones versus Total Market Index (Excluding Dividends reinvestment) 1999-2009

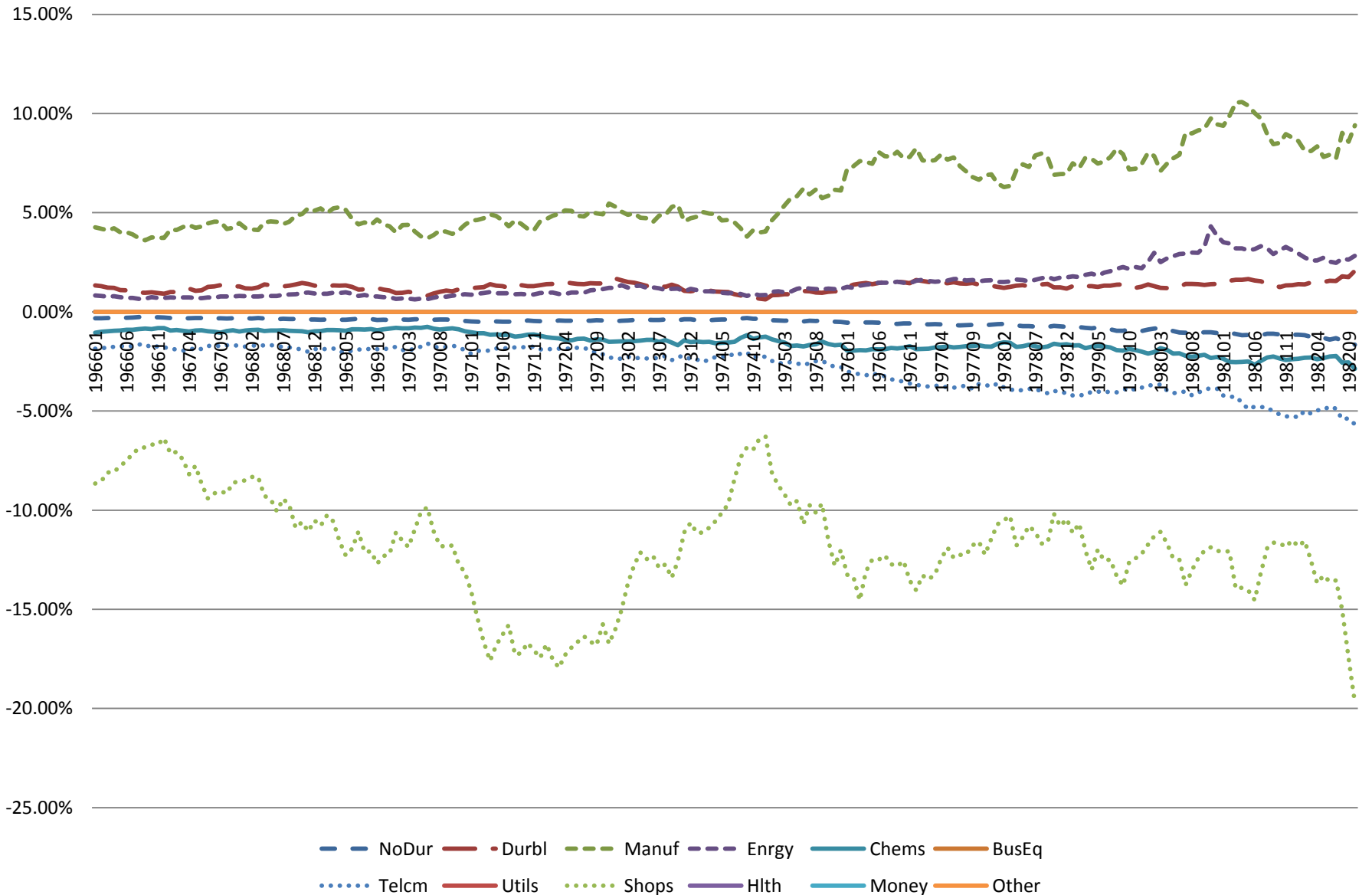


Fama and French 12 Industry Classification

Industry	Name	Description
1	<i>NoDur</i>	Consumer NonDurables -- Food, Tobacco, Textiles, Apparel, Leather, Toys
2	<i>Durbl</i>	Consumer Durables -- Cars, TV's, Furniture, Household Appliances
3	<i>Manuf</i>	Manufacturing -- Machinery, Trucks, Planes, Off Furn, Paper, Com Printing
4	<i>Enrgy</i>	Oil, Gas, and Coal Extraction and Products
5	<i>Chems</i>	Chemicals and Allied Products
6	<i>BusEq</i>	Business Equipment -- Computers, Software, and Electronic Equipment
7	<i>Telcm</i>	Telephone and Television Transmission
8	<i>Utils</i>	Utilities
9	<i>Shops</i>	Wholesale, Retail, and Some Services (Laundries, Repair Shops)
10	<i>Hlth</i>	Healthcare, Medical Equipment, and Drugs
11	<i>Money</i>	Finance
12	<i>Other</i>	Other -- Mines, Constr, BldMt, Trans, Hotels, Bus Serv, Entertainment

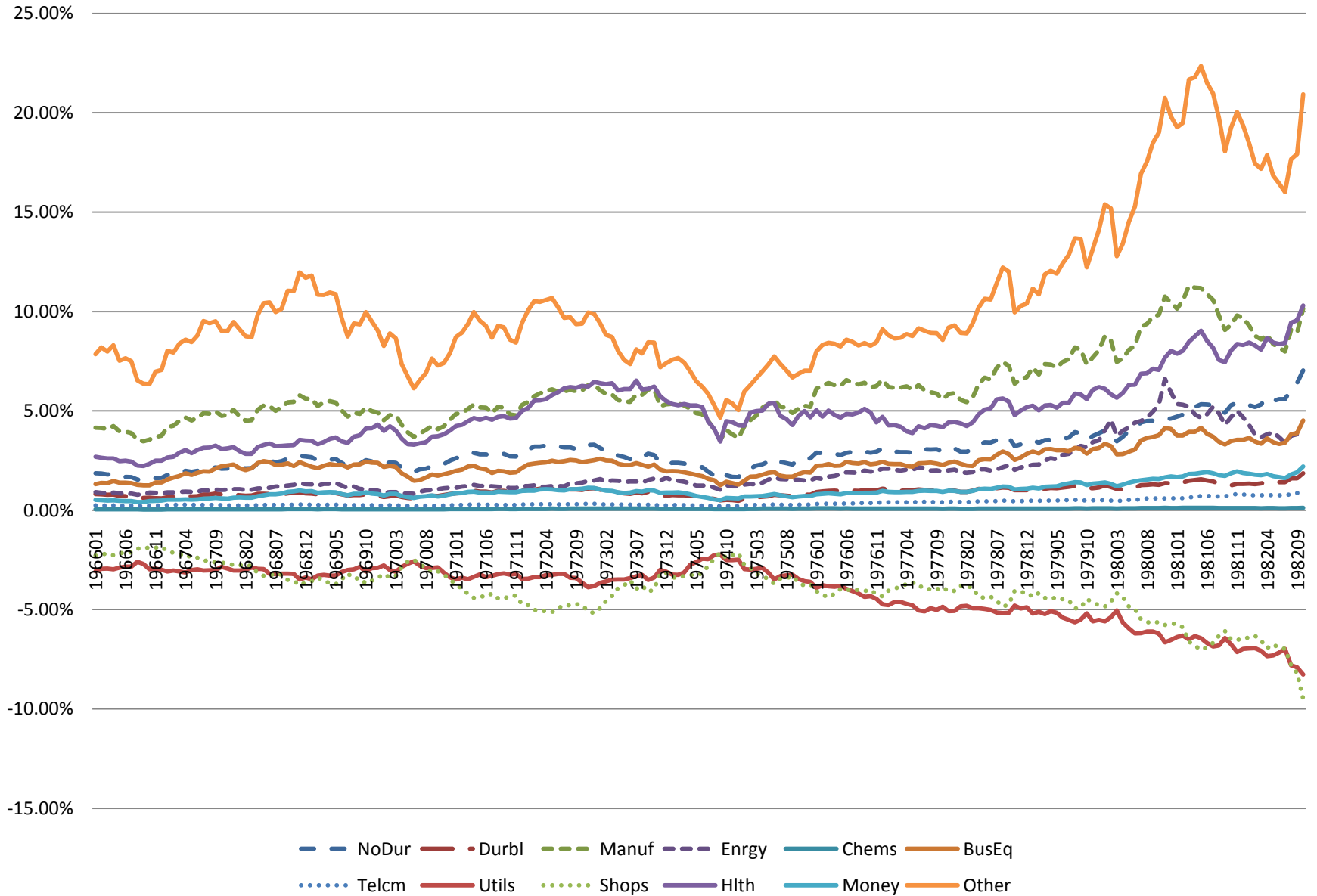
DJIA Constituents Performance - By Industry

1966-1982



Overall Market Performance - By Industry

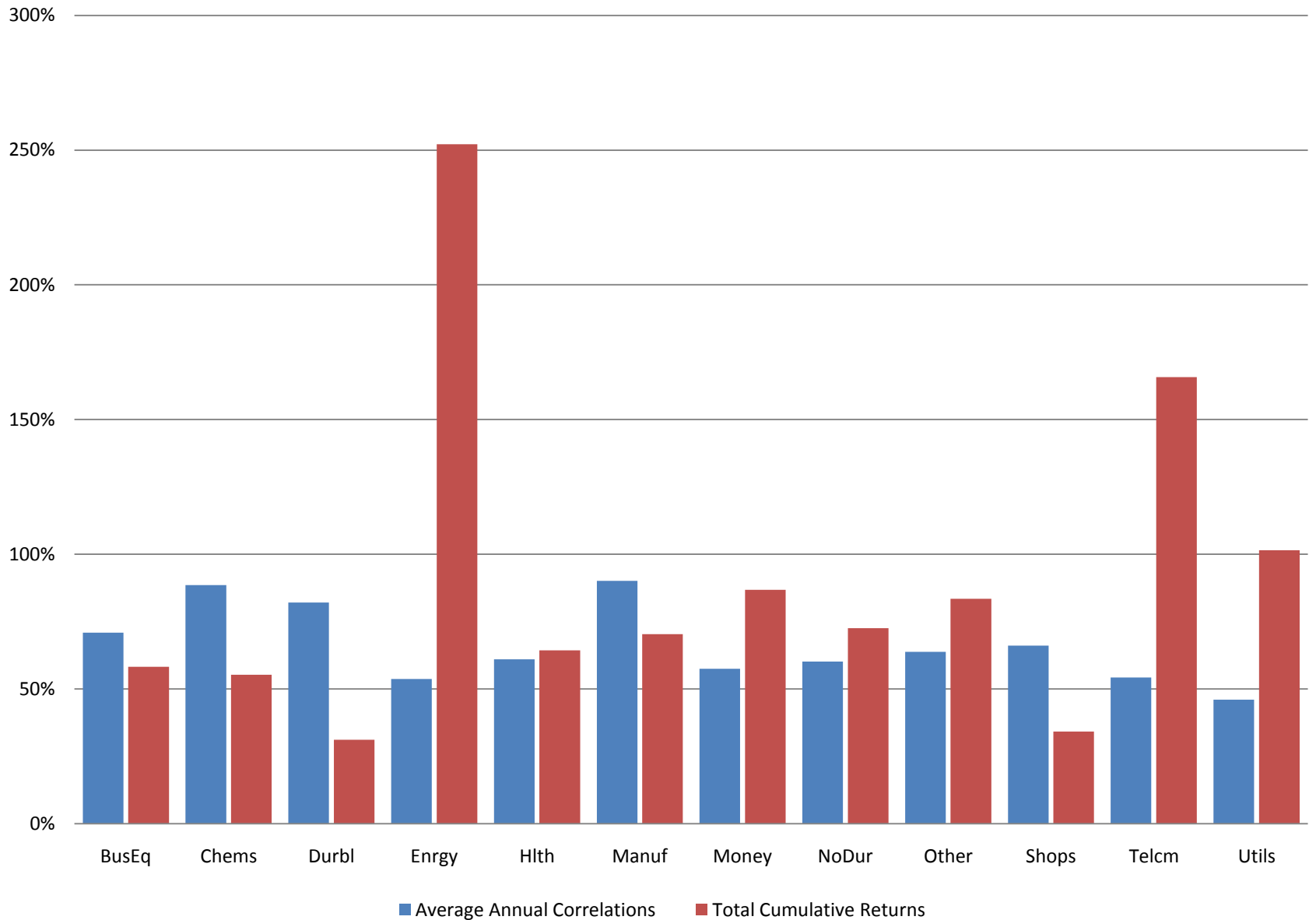
1966 - 1982



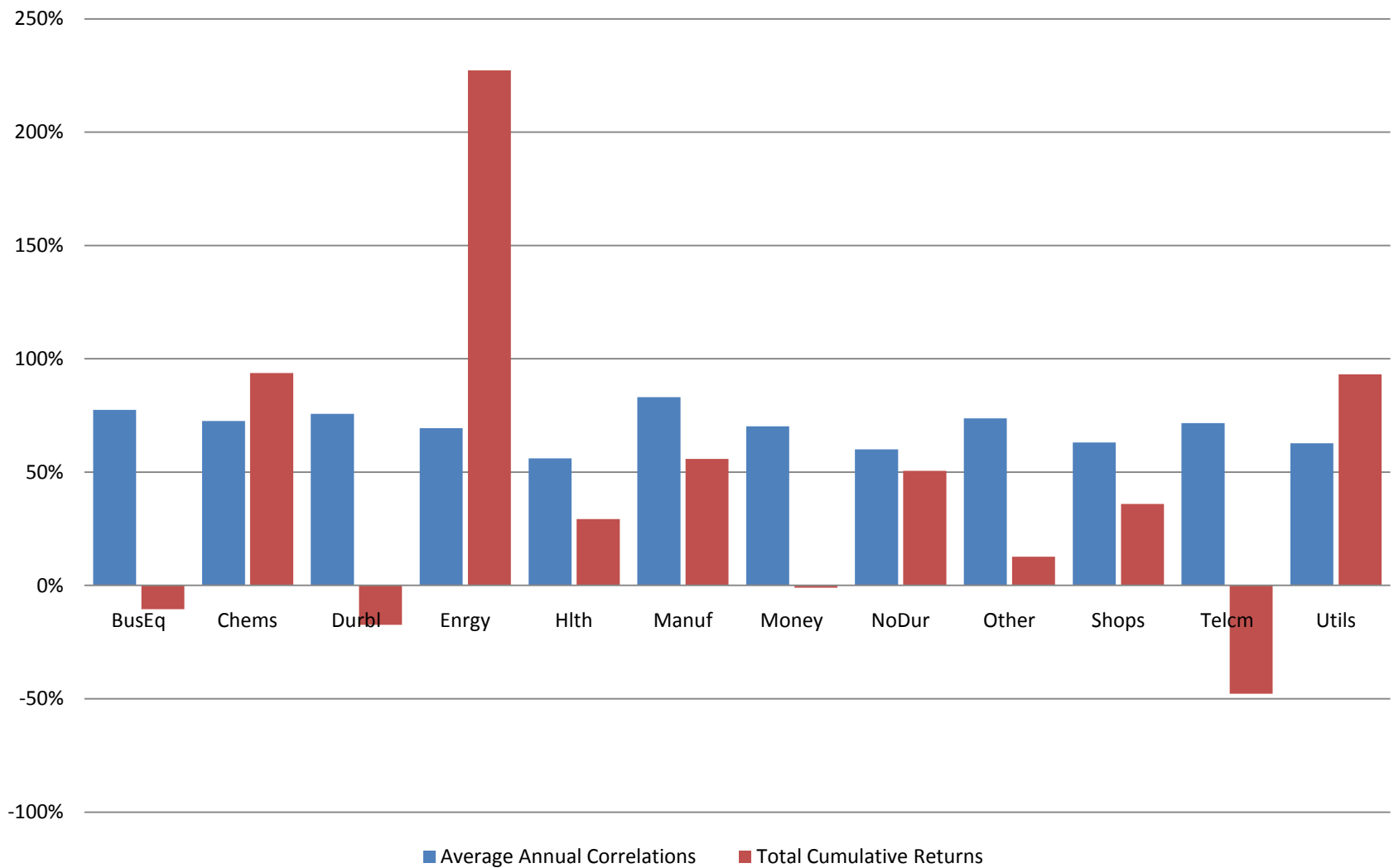
Correlation of DJIA Index with Cumulative Industry Returns, by Decade

	BusEq	Chems	Durbl	Enrgy	Hlth	Manuf	Money	NoDur	Other	Shops	Telcm	Utills
1960	70%	97%	95%	88%	77%	81%	66%	82%	84%	79%	90%	93%
1970	50%	62%	66%	19%	53%	55%	44%	55%	39%	74%	24%	27%
1980	87%	100%	99%	96%	99%	99%	98%	99%	99%	98%	96%	97%
1990	96%	99%	99%	98%	99%	96%	99%	97%	96%	98%	95%	96%
2000	41%	62%	68%	63%	85%	87%	81%	68%	89%	77%	44%	74%

Correlations and Performance of Dow Jones Returns with Monthly Industry Returns: 1966 - 1982



Correlations and Performance of Dow Jones Returns with Monthly Industry Returns: 1999 - 2009



Macro look: DOW and Fundamentals

- How much Dow performance is correlated with the overall economic indicators
- We looked at
 - CPI (consumer price index)
 - PPI (producer price index)
 - Default spread (difference between Moody's Baa and Aaa-rated portfolios)
 - Term spread (measuring slope of the yield curve)
 - Quarterly productivity of the business and manufacturing sectors of the economy
 - Industrial Production index (from the Federal Reserve)
 - Aggregate dividend yield of the market
 - Purchasing Managers Index (PMI) and New Factory Orders from the Institute for Supply Management
 - Seasonally-adjusted Initial and continuing claims
 - Total nonfarm and private payrolls

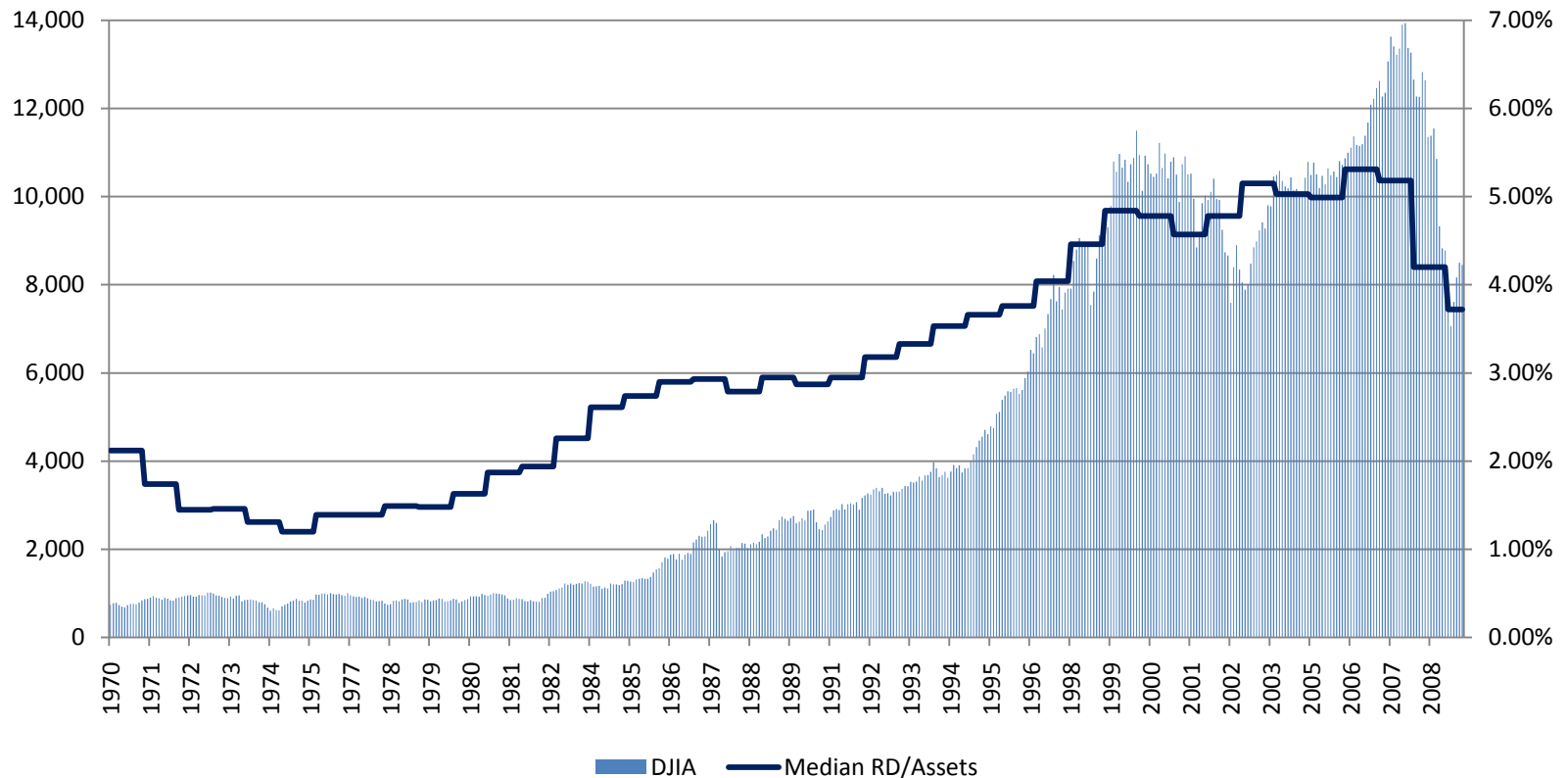
Correlations with fundamentals

1966-1982, 1982-1999, 1999-2009

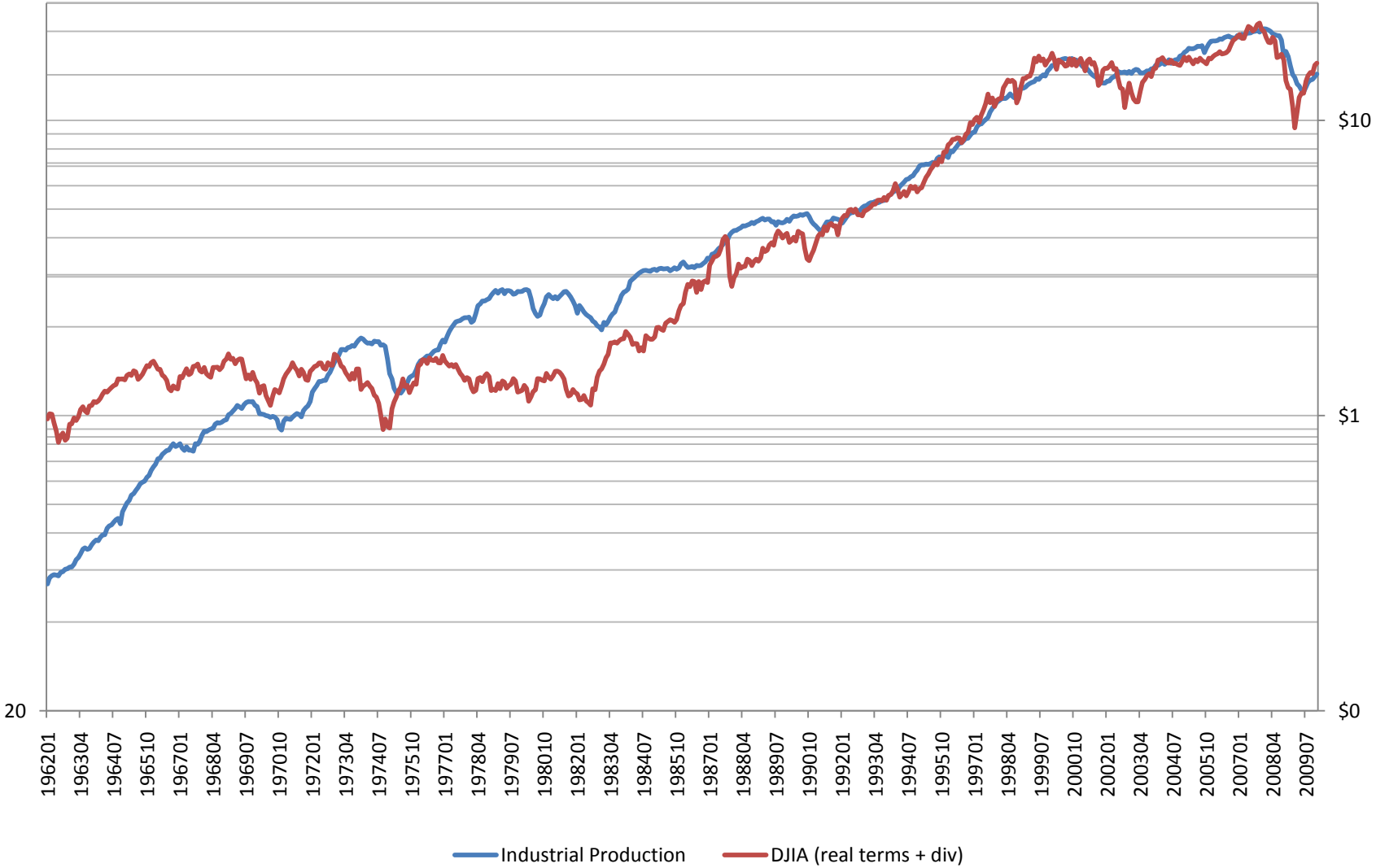
Period	DJIA	S&P500	DJIA	S&P 500	DJIA	S&P 500
	jan 1966-Nov 1982		Dec 1982-Mar 1999		Apr 1999-Dec 2009	
Mean	853.37	95.46	3520.05	440.14	10523.15	1205.02
STD	95.28	16.66	2247.53	273.35	1429.20	197.21
Nobs	251.00	251.00	196.00	196.00	123.00	123.00
DJIA (level)	1.00	0.79	1.00	1.00	1.00	0.90
S&P 500 (level)	0.79	1.00	1.00	1.00	0.90	1.00
CPI (all items)	0.24	0.71	0.89	0.87	0.30	0.00
CPI (less energy)	0.25	0.71	0.89	0.87	0.23	-0.07
Default Spread	0.16	0.55	-0.70	-0.68	-0.38	-0.50
Term Spread	0.07	-0.01	-0.45	-0.45	-0.50	-0.66
Industrial Production	0.39	0.74	0.97	0.96	0.78	0.61
Business Sector Productivity	0.40	0.73	0.91	0.91	0.19	-0.14
Manufacturing Sector Productivity	N/A	N/A	0.97	0.96	0.27	-0.05
Producer Price Index	0.22	0.68	0.83	0.80	0.43	0.18
Value-weighted Dividend Yield	0.18	0.54	-0.85	-0.84	0.34	0.11
Purchasing Managers Index (PMI) from ISM	0.18	-0.16	-0.11	-0.12	0.28	0.30
New Factory Orders	0.19	-0.15	-0.13	-0.14	0.14	0.14
Initial Claims (seasonally adjusted)	-0.07	0.31	-0.44	-0.43	-0.48	-0.61
Continuing Clams (seasonally adjusted)	-0.03	0.28	-0.28	-0.27	-0.48	-0.68
Total nonfarm payrolls	0.35	0.74	0.89	0.88	0.53	0.33
Total Private Payrolls	0.34	0.75	0.90	0.88	0.59	0.44
RD/Assets	0.08	0.28	0.92	0.91	0.66	0.47

Can proxies for the innovation intensity of the US economy explain DOW performance?

- RD/Assets ratio and DOW performance seem to comove reasonably well: 93% correlation over the entire period
 - RD/Assets ratio flat during 1970-1982, just as Dow is flat around 1,000 mark
 - Steady increase in R&D is accompanied by a steady increase in Dow
 - Relatively flat Dow performance around 10,000 is associated with flat (even decreasing R&D during 1999-2009)



Industrial Production: leading or lagging?



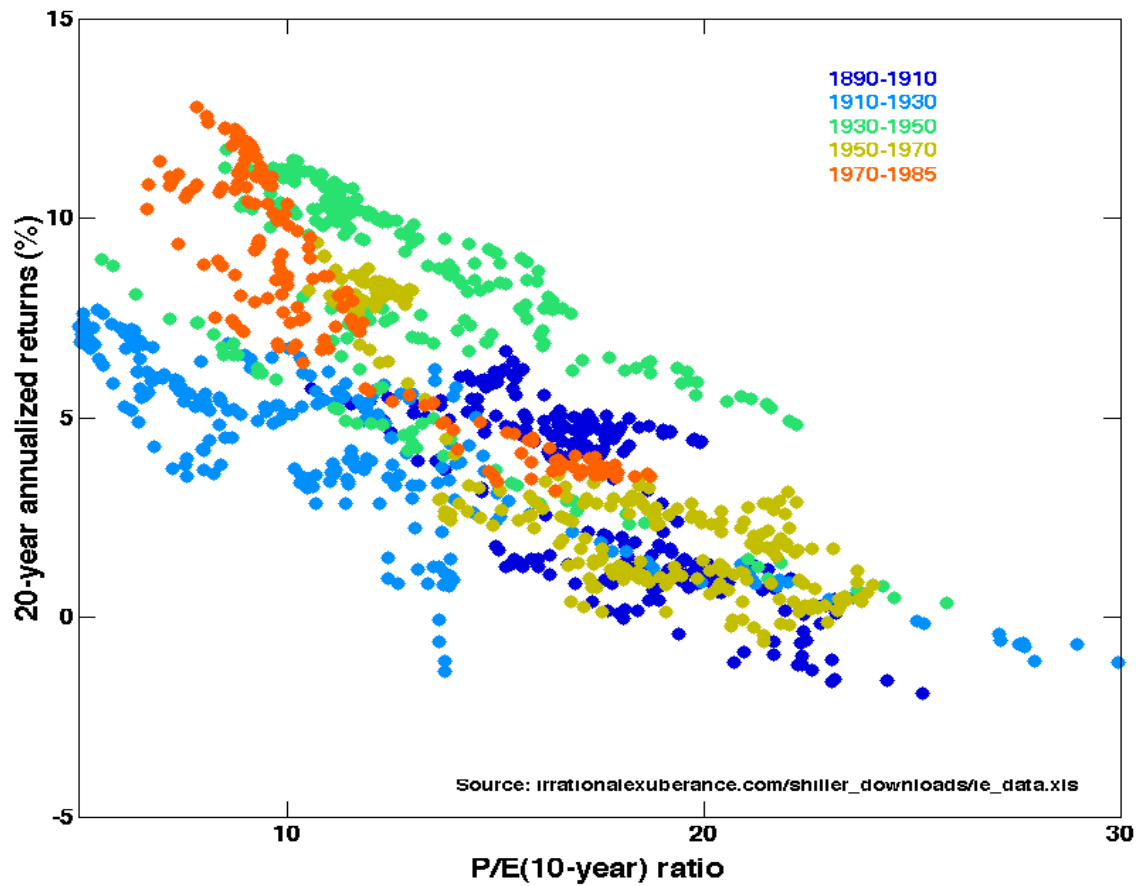
Composition of US economy has been changing during the period. However, the general pattern, from goods to services was not alter. No change on change.

<i>Number of Employees by Industry (Proportion of Total)</i>	1962	1982	1998	2008
All Industries	100.0	100.0	100.0	100.0
<i>Selected Groups</i>				
Agriculture	3.1%	1.7%	1.0%	0.9%
Construction	4.6%	4.2%	4.7%	5.2%
Manufacturing	24.7%	18.1%	13.3%	9.4%
whole sale trade	4.5%	4.8%	4.2%	4.2%
Retail Trade	9.6%	10.9%	11.2%	10.9%
Finance, Insurance, Real Estate	3.4%	4.3%	5.8%	5.7%
Professional and business services	4.3%	7.5%	11.5%	12.6%
Educational Services	1.1%	1.4%	1.7%	2.2%
Health Care and Social Assistance	3.2%	7.1%	9.5%	11.1%
Arts, entertainment, recreation, accommodation, and food services	4.9%	7.0%	8.5%	9.5%
Government	20.1%	19.5%	16.9%	17.4%

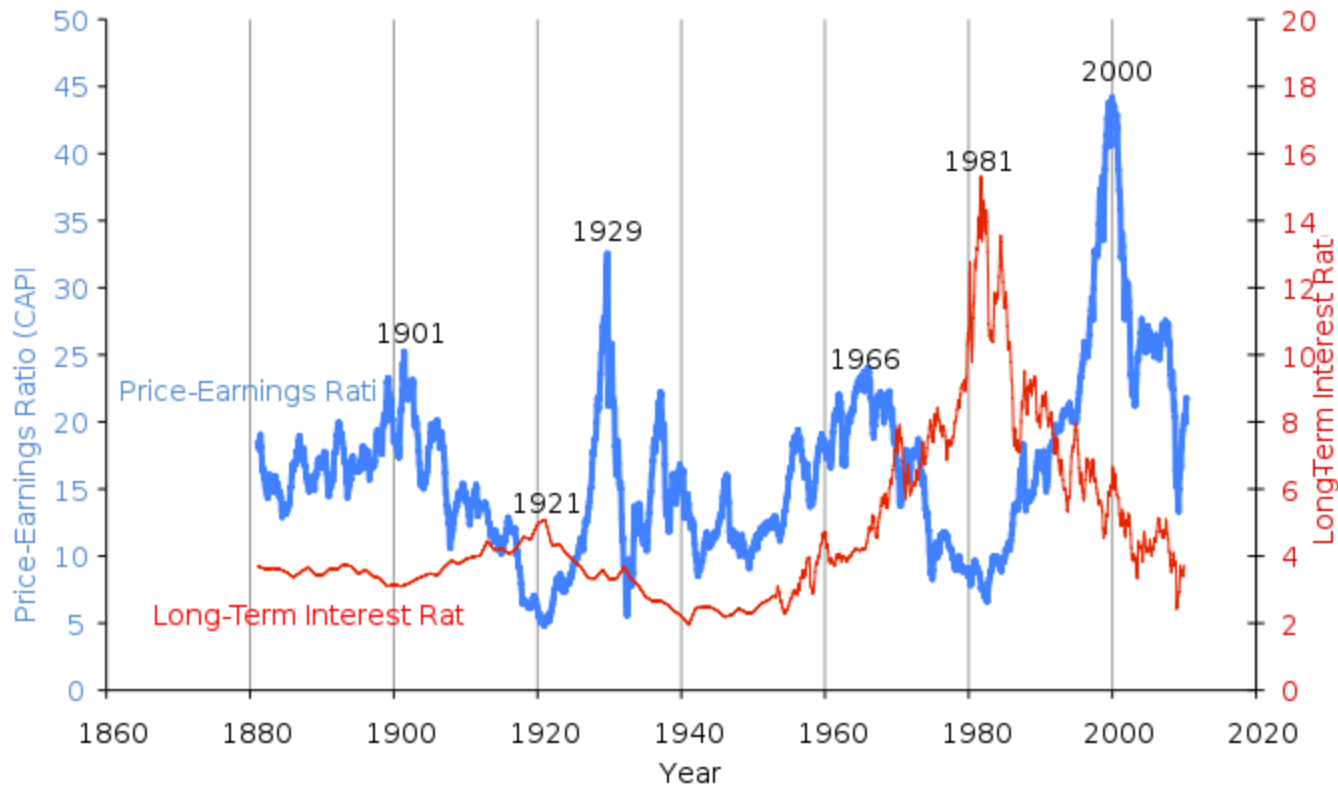
Source: BEA

Price/Earnings Ratios as Predictor of Future 20-year Returns? (Source: Shiller)

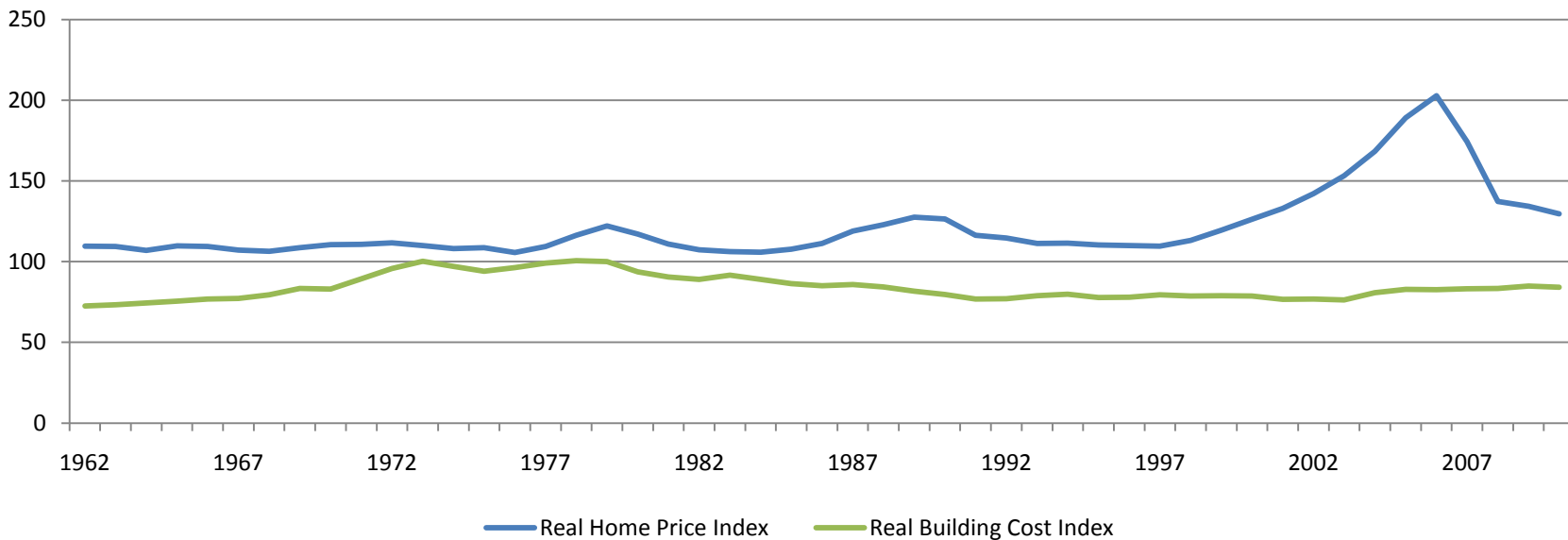
See 1970-1985



Historical P/E Ratios. Would Historical high ratios imply lower returns in the future?



Exploration on House Bubble 2000's



Proportion of GDP into Construction and Real Estate activities 1998-2009

