

General Electric Performance over a Half Century: Evaluation of Effects of Leadership and Other Strategic Factors by Quantitative Case Analysis

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ABSTRACT

We conducted quantitative case analysis of inflation-adjusted profitability and relative market value at General Electric over a half-century, to examine the influence of Jack Welch and others as CEO and of various strategic and environmental factors. Over the first decade of Welch's leadership, there was no improvement in GE's real ROE. However, there was market value increase, and later there were improvements in both measures due to declining competition. Over 90% of variances in real profitability and comparative market value were explained using measures often considered in strategy--changes in competitive environment, leadership and corporate culture, labor relations and plant closings, and economic and financial environments. It appears that systematic appraisal of corporations can aid understanding of factors that determine profitability and market value.

JEL Classification: C32, C53, C81, D21, D23, D24, D43, E31, E51, J24, J52, K42, L13, L21, L22, L25, L26, M12, M14, O30.

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I. INTRODUCTION

Jack Welch, who was the CEO of General Electric from 1981 through 2000, is one of the most widely acclaimed and admired contemporary business leaders in the United States. During his tenure at GE, Welch produced more money for shareholders than anyone else except Bill Gates at Microsoft (Byrne, 1998). The market capitalization of GE shares went from 12 thousand million dollars in 1981 to 500 thousand million dollars by 2000 (*Multinational Monitor*, 2001).

A. Welch's Style as a Model for Effective Management

In describing elements of Welch's operating style that may have contributed to success, Edwin Locke (2002) identified *leader's guides to action* including: (1) Face reality as it is, not as you want it to be. (2) Control your destiny or someone else will. (3) Change before you have to. (4) Compete to win. Under Welch's leadership, Locke noted a clearly articulated set of institutional guidelines which included: (1) Show integrity. (2) Hate bureaucracy. (3) Be open to new ideas, regardless of the course. (4) Pursue high quality, low cost, and speed. (5) Have self confidence. (6) Have a clear, reality-based vision. (7) Have a global focus. (8) Use stretch goals and differential rewards. (9) View change as an opportunity, not as a threat. (10) Finally, possess energy and energize others. Locke (2002) appraised six books about and one written by Welch, stressing the importance of *simplicity*. As stated by Welch (Lowe, 1988: 155): "Simplicity is a quality sneered at today in cultures that like their business concepts the way they like their wine, full of nuance, subtlety, complexity, hints of this and that ... cultures like that will produce sophisticated decisions loaded with nuance and complexity that arrive at the station long after the train has gone ... you can't believe how hard it is for people to be simple, how much they fear being simple. They worry that if they're simple, people will think they are simpleminded. In reality, of course, it's just the reverse. Clear, tough-minded people are the most simple."

According to Tichy and Sherman (1993), Jack Welch saw reality objectively and consistently applied this orientation. He was willing to face reality, even if it was different from that in the past: "Facing reality as it is, not as it was or as you wish ... facing reality is crucial in life, not just in business. You have to see the world in the purest, cleanest way possible or you can't make decisions on a rational basis."

As noted by Locke (2000), Welch was a problem finder, not just a problem solver. When he became CEO in 1981, General Electric already was quite profitable, without obvious problems. He grasped the reality that if the status quo continued GE eventually would decline, so he proceeded to transform the company. Even during his final years at GE, Welch was not content to rest on his triumphs. Thrusts in the 1990s included a massive quality program ("6 sigma"), a push further into financial services, and a string of acquisitions meant to give GE technological leadership in key industries.

A related aspect of Jack Welch's leadership was to set goals that seemed difficult or even impossible (Locke, 2000). He required that every business in GE's portfolio be number one or two in its industry--in the United States, and later in the world as a whole. Steve Kerr of General Electric described the GE "stretch target" as "basically an extremely ambitious goal, [which] gets your people to perform in ways they never imagined possible. It's a goal that, by definition, you don't know how to reach"

(Sherman, 1995). Although GE attained a record 14.5% operating margin and a 25% return on equity in 1997, Welch still was not satisfied. He planned a major restructuring because he did not believe General Electric to be sufficiently competitive in several of its business units. Moreover, he was not a proponent of incremental change; to him this was not significant or revolutionary enough to be able to maintain competitiveness (Locke, 2000).

B. Other Views of Jack Welch

However, Jack Welch was not without critics. While CEO, he made unpopular decisions, such as divesting historical but low profit margin GE product lines, eliminating almost 200,000 employee positions between 1982 and 1994--nearly half the labor force in 1981 when he assumed control. Welch also was at the helm during the failed acquisition of Kidder Peabody (Byrne, 1998).

O'Boyle (1998) noted downsides of Welch's transformation of GE in real but hidden costs from downsizings, from numerous acquisitions, and from a diminished role for manufacturing and related R&D at GE. O'Boyle examined government documents and private correspondence, and conducted 320 personal interviews. He concluded that the basis of Welch's success was a kind of financial gamesmanship rather than superior management or technical innovation. Elliott (2003) describes the beginning of a reemphasis on high technology following Welch's exit. In particular, O'Boyle (1998) and Byron (2004) found that Welch's "win at any cost" style of leadership might tempt some employees to behave unprofessionally in trying to deliver winning results.

Damage from a competitor orientation has been demonstrated in recent scandals and in quantitative analyses comparing twenty corporations by Armstrong and Collopy (1996), Franke, Armstrong, and Vaclavik (1998), and by Armstrong and Green (2007) in the preceding article. O'Boyle (1998) claimed that Welch took humanity and compassion out of business, short-changing employees and communities in pursuit of profits. In the long run, as in the case of the recent adverse court decision requiring that GE clean up its decades old PCB pollution of the Hudson River, this could lead to serious costs to the corporation.

Downsizing has become standard practice for many American corporations in recent decades. But Cascio (1993; 2002), Baumohl (1993), and O'Toole (1995) find that toughness and layoffs often do not lead to increases in profitability and stock price. A general finding empirically is that downsizing does not increase an organization's ability to compete nor does it produce the expected rebound in earnings. As shown in the earlier article by Franke and Miller (2007), since downsizing usually increases capital intensity and decreases capital utilization it can be expected to impact negatively both profitability and growth; for example, there was little *real* sales growth under Welch except through acquisitions. Also, costs of downsizing include survivors' tending to experience higher levels of stress, exhibit higher absenteeism and turnover, and to become more risk-averse and self-absorbed. Baumohl's (1993) report on an AMA survey of 500 downsized companies showed a drop of morale in 75% of the firms, no increase in efficiency for 66%, and a minority with profitability increase.

Under Welch according to O'Boyle (1998), General Electric--which had extraordinary capabilities in engineering, research, and development--appears to have

fallen behind in these areas. In every year from 1900 to 1986, GE was number one among American corporations in obtaining patents. Following the transformation by Welch, GE was not even among the top twenty U.S. corporations in terms of its inventions. These included light bulbs, the first diesel locomotive, synthetic diamonds, the first X-ray machine, the first commercial jet engine, and the first home refrigerator.

We examine whether General Electric benefited from the leadership of Jack Welch. We follow suggestions of Summer et al. (1990) that appraisals of companies should be longitudinal over relatively long periods of time and should be empirical (statistical), focusing on after-tax return on stockholders' equity. Recognizing the problem noted by the Council of Economic Advisers (1989: 47) that inflation causes "accounting--historical cost--rates of return reported to stockholders and upper management to diverge sharply from real rates of return," we employ the inflation adjustment procedure described by Franke and Edlund (1992) to calculate GE's *real* return on equity after taxes under CEOs Ralph Cordiner (1951-63), Fred Borch (1964-72), Reginald Jones (1973-80), John Welch (1981-2000), and Jeffrey Immelt (since 2001). We also develop *real* volume-weighted average annual indices of GE and Dow Jones stock values. GE's profitability and comparative market value then are evaluated to determine factors contributing to performance over time.

II. HYPOTHESES

Our *first hypothesis* is that GE's real profitability in the first decade under Welch did not improve. The *second hypothesis* is that real profitability increases in the remaining period under Welch were largely due to causes other than his leadership, in particular to the quasi-monopolistic position in major markets resulting from the collapse of the Westinghouse Corporation, which had been GE's primary competitor (*Business Week*, 1977; Franke et al., 1994). Our *third hypothesis* is that Welch was successful at increasing stock valuation, even when measured in real terms, but that decreased competition rather than Welch was the primary contributor to this index of corporate performance.

III. METHOD

Procedures for data gathering and transformation are described by Franke and Edlund (1992). In brief, we implemented the suggestions of Wheelen and Hunger (1989) and Summer et al. (1990) for long-term evaluation of firm performance, using time-series "econometric" analyses of real data. This had not been carried out by others, but is related to the real analyses of business units by Buzzell and Gale (1987). Data from *Fortune* since 1955 were augmented by *Moody's Industrial Manual* for selected years, with year by year inflation adjustment of net income and of additions to equity capital using GDP and GNP deflators from the *Economic Report of the President* for 1991 and 2003. All measures are adjusted to year 2000 dollar values. We also used data from *Yahoo* and the *ERP* to calculate real (2000-dollar) yearly stock prices for GE from trading-volume-weighted averages of highs and lows for each day over 1962 to 2002, and related these to similarly calculated yearly averages from the Dow-Jones Index (for 1951 to 2002).

The development of higher quality and real data and then correlation and stepwise multiple regression analysis of performance indicators are used to seek underlying sources of differences over time in corporate performance. Approaches to problems of significance, multicollinearity, serial correlation, and heteroscedasticity in time-series analysis are in Franke and Kaul's (1978) and Franke's (1980) appraisals of the Hawthorne Experiments at Western Electric. Examples of industry and corporate evaluation are in Franke (1987) and Franke and Edlund (1992). Quantitative case analysis requires focus not merely upon statistical significance and variance explanation, but also attention to sign reversals from multicollinearity and to incomplete or incorrect attribution due to serial correlation. The development of psychological motivation data and their use in explaining performance differences are provided for national cultures and for corporate executives by Franke (1974; 1975), Franke, Mento, and Brooks (1985), Franke, Hofstede, and Bond (1991; 2002), Franke and Edlund (1992), Franke et al. (1994), Franke, Edlund, and Vaclavik (1998), and Franke and Barrett (2004).

IV. RESULTS

A. Real Return on Equity over Time

While the reported *apparent return on equity* after taxes (ApROE) for General Electric generally rose over 1951 to 2002, correlating .62 with the passage of time, the *real return on equity* (RealROE) was little changed (until the later 1990s), correlating only non-significantly with time in *Table 1* (see data for individual years in the *Appendix* table). In particular, during the first decade with Jack Welch as Chief Executive Officer, RealROE averaged slightly *lower* than it did over the seven years of Reginald Jones, his predecessor as CEO.

B. Factors Underlying GE Profitability

The strongest Pearson correlation for RealROE is with the dummy variable of demise of Westinghouse after 1996. Other zero-order correlations that are significant, in *Table 1*, are the GE stock price relative to the Dow-Jones index (a separate dependent variable), GE's capital intensity (unusual in that it is not negatively related to RealROE, perhaps due to multicollinearity—see later tables), and money supply growth (negative probably due to adverse inflationary effects on GE Financial).

Multiple regression explains 93% of the variance in RealROE over 52 years, as shown in *Table 2*, using as explanatory variables:

(A) *Competitive factors*, including Westinghouse's demise as a great benefit, but also the ethical and financial costs of a price-fixing scandal four decades ago.

(B) *Corporate culture* high in the power motivation index of managerial proclivity and in the achievement motivation index of entrepreneurship (cf. Franke, 1974; McClelland, 1961; 1985). Also, the leadership of CEO Jones, directed to efficient management of existing enterprises using real-value accounting according to *Business Week* (1977) and Loomis (1981).

Table 1
GE QCA: Descriptive statistics and Pearson correlation coefficients.

	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	RealROE	ApparROE	RelStPr	CapInt	AchMot	AffMot	PowMot	M2Grow	FuelInfl	DJrealGrow
Mean:	11.48	18.22	12.72	100.30	7.88	-3.12	7.13	6.48	4.03	4.50
Std. Deviation:	2.25	3.22	10.90	78.17	3.67	6.73	2.93	2.72	10.53	13.19
(1) Year	.18	.62**	.88**	.90**	.70**	.84**	-.83**	.11	.00	.07
(2) Real ROE after taxes	1.00	.82**	.85**	.43**	-.00	-.21	.22	-.34*	-.01	.24
(3) Apparent ROEat	.82**	1.00	.87**	.73**	.22	.28*	-.27	-.23	.07	.27
(4) GE Stock Price Relative to DJ	.85**	.87**	1.00	.88**	.48**	.40**	-.34*	-.36*	-.07	.24
(5) Capital Intensity	.43**	.73**	.88**	1.00	.61**	.61**	-.55**	-.25	-.13	.21
(6) Achievement Motivation	-.00	.22	.48**	.61**	1.00	.76**	-.68**	.20	-.24	-.02
(7) Affiliation Motivation	-.21	.28*	.40**	.61**	.76*	1.00	-.96**	.31*	.04	.02
(8) Power Motivation	.22	-.27	-.34*	-.55**	-.68**	-.96**	1.00	-.43**	-.16	.09
(9) Money Supply Growth, 3 yrs.	-.34*	-.23	-.36*	-.25	.20	.31*	-.43**	1.00	.12	-.30*
(10) Fuel Price Inflation	-.00	.07	-.07	-.13	-.24	.04	-.16	.12	1.00	-.34*
(11) Dow Jones Real Growth	.24	.27	.24	.21	-.02	.02	.09	-.30*	-.34*	1.00

Notes: 1951 to 2002, except 1962 to 2002 for variable (4). *p < .05, **p < .01, two-tailed, if no serial correlation. Variables (2) to (4) are corporate performance measures. Variable (5) is corporate real equity per employee, in thousands of 2000 U.S. dollars per person. Variables (6) to (8) are measures of corporate culture derived from letters to the shareholders (stakeholders). Variables (9) to (11) are characteristics of the external environment. Variables (5) to (11) are those which explain variance in performance measures (2) and (4), shown in regression models of Tables 2 and 3, which also use important competitive and other dummy variables. Year-by-year data for the Table 1 variables are in the Appendix.

(C) *Labor relations* costs, including dummy variables for a strike and plant closings.

(D) *External Economic and Financial* variables including money supply growth, which might adversely affect GE's financial business, the two oil shocks which damaged the underlying U.S. and world economies, fuel price inflation (which, holding constant the broad economic damage from oil shocks, might have been to the advantage of Utah International and other GE resources and energy businesses), and stock market real price increases which would benefit GE's pension reserves, surpluses from which were added to GE income and thus RealROE (Birger, 2000).

Table 2
GE QCA: Regression equation for GE inflation-adjusted (real) ROE.

Dependent variable and category of independent variables	Unstandardized regression coefficients	Independent variables	[Order of entry in step-wise regression]	Slope coef./std. error and significance (given adequate Durbin-Watson)
RealROE (1951-2002)	= 8.23			
+ (A) Competitive and Legal Environment	+ 5.10*Westinghouse Gone (97+) - 3.14*Price Fixing Suit (1960) - 2.12*Price Fixing Costs (1964)		[1] [5] [11]	(t = 6.31, p < .0005) (t = -4.20, p < .0005) (t = -2.81, p = .008)
+ (B) Corp. Culture and Leadership in Internal Environ.	+ 0.42*Power Motivation + 0.21*Achievement Motivation + 2.97*CEO Jones (1973-80)		[2] [12] [8]	(t = 4.78, p < .0005) (t = 2.67, p = .011) (t = 4.20, p < .0005)
+ (C) Labor Relations and Plant Closings in Internal Environ.	- 3.59*Strike (1969-70) - 2.23*Plant Closings (1997) - 2.34*Discontinued Ops. (1994)		[3] [6] [7]	(t = -6.36, p < .0005) (t = -2.72, p = .010) (t = -2.97, p = .005)
+ (D) External Economic and Financial Environment	- 0.34*Money Supply Growth - 3.46*Oil Shock (74, 75, 79, 80) + 0.060*Fuel Price Inflation + 0.020*Real Dow Jones Growth		[4] [9] [10] [13]	(t = -6.40, p < .0005) (t = -5.74, p < .0005) (t = 4.27, p < .0005) (t = 2.02, p = .050)

with variance explanation = 92.6%, adjusted = 90.1%, and Durbin-Watson coefficient = 1.869 (showing little serial correlation and little indication of model misspecification).

Notes: Real Return on Equity (range from 7.19% in 1969 to 17.07% in 2000) is calculated with both income after taxes and equity capital in constant 2000 dollars over time, as described by Franke and Edlund (1992). Westinghouse Gone is a dummy variable of 0 for 1951-1996 and 1 for 1997-2002, after Westinghouse's demise as GE's principal competitor. Price Fixing Suit is a dummy of 0 except 1 in 1960, the year of anti-trust indictments leading to disgrace and executive imprisonment and corporate and executive fines. Price Fixing Costs of nearly 500 million current dollars are a dummy of 0 except 1 in 1964. Power Motivation (range from 5 for Welch to 12 for Cordiner) is David McClelland's (1961) concept as computed from computer content analysis of imagery in letters to shareholders in the second year signed by each CEO, as described by Franke (1975) and Franke and Edlund (1992). It is part of a managerial motivation tendency described by Franke (1974) and McClelland (1980). Achievement Motivation (range from 3 for Cordiner to 16 for Immelt; Welch = 10) is an entrepreneurial tendency of similar origin. Strike was a 14-week strike in 1969-70, which seriously disrupted GE's ability to provide goods and services. Money Supply Growth (range from 1.17%/year up to 1994 to 12.09%/year for 1977) is calculated for the most recent three-year period from M2 in the *Economic Report of the President* for 1991 and 2003. Fuel Price Inflation (range from -21.88%/year up to 1986 to +38.94%/year up to 1980) is calculated since the most recent year from motor fuel price data from the *ERP*. Dow Jones Index data from yahoo are inflation-adjusted to 2000 dollar values using the GDP and GNP deflators from both volumes of the *ERP*. Other dummy variables of 1 (vs. 0) are for the years of occurrence indicated, from financial records and business literature (*Business Week*, *Dun's*, *Economist*, *Euromoney*, *Forbes*, *Fortune*, *Money*).

C. Market Value over Time

As shown in the correlation with time in Table 1, and in the yearly data of the Appendix table, the stock price for GE relative to the Dow-Jones value (both volume-weighted

annual averages of daily highs and lows) rose dramatically since 1962. The comparative market value of General Electric is not associated with the growth rate of real Dow Jones stock market values as a whole, which did not rise significantly over time. Relative stock price is associated strongly with the passage of time, and is positively correlated only with *Welch* among the CEO dummy variables.

D. Factors Underlying GE Relative Market Value

GE relative stock price is associated even more strongly with GE's competitive situation (the ratio of Westinghouse to GE revenues, $r = -.92$, not in Table 1) than with time. It relates positively and significantly also with profitability, capital intensity (perhaps the management macho effect of downsizing on stock purchasers), and, among corporate culture characteristics, primarily with entrepreneurial management (Table 1).

The regression model in Table 3 shows that, as for RealROE, relative stock price was affected primarily by the demise of Westinghouse as General Electric's major competitor. And for stock market perception at least, *increased* capital intensity--largely due to the downsizing of nearly half of GE's employees by CEO Welch--also increased GE's market value. Finally, the plant closings in 1997 and perhaps other events that year such as the bankruptcy of Montgomery Ward (a GE Capital borrower) had an adverse effect upon GE's relative stock value. In all, the model explains 96% of the variance in relative market value, in a far simpler model than that for real profitability. As for RealROE, the primary factor in higher performance was reduced competition.

Table 3
GE QCA: Regression equation for GE stock price (as adjusted for splits) per 10,000 units of Dow Jones Index (similarly adjusted).

Dependent variable and category of independent variables	Unstandardized regression coefficients	Independent variables	[Order of entry in step-wise regression]	Slope coef./std. error and significance (given adequate DurbinWatson)
GE Stock Price relative to Dow (1962-2002)	= 1.65			
+ (A) Competitive Environment	+ 19.10*	Westinghouse Gone (97+)	[1]	(t = 12.53, p < .0005)
+ (B) Leadership and Resource Allocation in Internal Environ.	+ 0.060*	Capital Intensity	[2]	(t = 7.30, p < .0005)
	+ 3.09*	CEO Welch (1981-2000)	[4]	(t = 2.96, p = .005)
+ (C) Labor Relations and Plant Closings in Internal Environ.	- 11.10*	Plant Closings (1997)	[3]	(t = -4.21, p < .0005)
with variance explanation = 95.8%, adjusted = 95.3%, and Durbin-Watson coefficient = 1.666 (showing little serial correlation and little indication of model misspecification).				

E. Results Organized according to Hypotheses

Hypothesis one, that GE's real profitability did not improve under Welch, is partially supported. It was not until 1988 that Welch regained the capital efficiency values averaged by CEO Jones over his tenure, and not until 1995, with the near-collapse of Westinghouse sales, that Welch substantially exceeded the real profitability of his predecessor (Appendix). Welch did not enter the final Table 2 regression equation as a dummy variable, and his personality evidenced in the February 1983 letter to GE shareholders showed him to be weakest among the five CEOs evaluated as to the strong managerial characteristic of high power and low affiliation motivation. Earlier steps in the regression that do show significance for Welch indicate negative rather than positive impact upon real return on equity. With some qualification, *hypothesis one* is supported.

Hypothesis two, that GE's real profitability increases were due to other causes, thus is supported. The other causes pictured in the regression model of Table 2 include some of the internal cultural and external economic variables disclosed by earlier quantitative case analyses of American and German firms (cf. Franke, 2000; 2007). In addition, the decline of GE's primary competitor was a factor of which GE seems to have been able to take advantage. Not all of the factors described in these sources came into play--for example, the growth of the U.S. economy did not seem to be important to GE's profitability, and capital intensity did not enter the final equation, negatively as expected or at all. But there were some familiar and other reasonable causal variables, allowing a 93% explanation of profitability variance. Thus, *hypothesis two* is supported.

Hypothesis three, that GE's increase in market value was due primarily to a more favorable competitive position, but that Welch also contributed positively, is supported by the model in Table 3. His person and the plant closings and downsizings for which he was responsible, contributing to higher capital intensity, appear to have influenced stock purchasers positively. However, the demise of a major competitor was the primary factor. *Hypothesis three* is supported.

V. DISCUSSION

Our empirical findings support the critics of Jack Welch as much as they do his admirers. GE was able to take advantage of the quasi-monopolistic opportunities presented by Westinghouse's disintegration and retreat from competition following 1991. There is some doubt as to Welch's stewardship in terms of *efficient utilization* of stockholder capital resources. Real (inflation-adjusted) returns on equity capital did not rise for his first decade, as the number of employees dropped nearly in half and capital intensity (real equity in 2000-dollars per employee) more than doubled, and finally tripled by the end of Welch's term in office.

Although the dummy variable for *Welch* did not enter the final regression model in Table 2, the results here and elsewhere do indicate that CEOs high in power motivation and secondarily in achievement motivation tend to obtain greater profitability. As shown in the Appendix table, Welch was one of the lowest in the power motivation index of effective management, but relatively high in the achievement motivation index of entrepreneurship (see means in Table 1).

Zero-order correlations of *Welch* as a dummy variable (not shown) provided a positive coefficient of .41 ($p = .002$) with apparent ROE, but no correlation with real ROE ($r = .03$). Entries at various steps of the regression model for real profitability (the final step of which is Table 2) also did not indicate benefits from Welch's leadership. For example, just before entry of *Jones*, *Welch* appeared to have had a significant but *negative* effect upon GE's RealROE ($p = .02$). Later, just before entry of *Achievement Motivation* (a positive factor in which Welch scored high), *Welch* again showed a significant but *negative* effect ($p = .05$). Thus there were no suggestions of positive and significant influences of Welch upon real profitability of General Electric once allowance was made for the demise of Westinghouse as a major competitor after 1996. But he did provide an aura of managerial strength, with the ability to hold GE on a survival course and to increase market value dramatically.

VI. CONCLUSION

Our conclusion, based on quantitative case analysis over 52 years (1951-2002) of GE's existence, suggests factors other than Jack Welch as primary contributors to GE's performance (which by all indices was excellent from the mid-1990s up to 2000). But for the first decade under his leadership, real (inflation-adjusted) return on equity did not improve, although GE real and relative stock prices performed extremely well.

This analysis suggests that systematic and empirical appraisal of business corporations over time can help in sorting out possible sources of better corporate performance. It may contribute to establishing a body of knowledge for improving the corporations that provide most of our goods and services and that provide much of our employment, experience, welfare, and social learning.

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APPENDIX

GE data for QCA analysis. (For dummy variables employed, see table footnotes.)

Year	RealROE	ApROE	RelStock	CapInt	AchMot	AffMot	PowMot	M2grow	FuelInf	RealDJgrow
1951	12.65	16.52	--	32.02	3	-14	12	1.87	2.63	12.61
1952	12.70	17.38	--	33.76	3	-14	12	3.82	2.56	4.13
1953	12.89	17.77	--	33.20	3	-14	12	4.32	6.00	0.43
1954	14.48	19.73	--	36.92	3	-14	12	4.23	2.83	21.21
1955	13.48	18.80	--	37.88	3	-14	12	3.66	1.38	24.74
1956	13.29	18.70	--	30.30	3	-14	12	2.96	3.17	8.76
1957	14.18	20.13	--	31.63	3	-14	12	2.69	4.39	-7.30
1958	13.00	18.53	--	37.42	3	-14	12	3.08	-1.68	3.48
1959	13.82	19.22	--	40.12	3	-14	12	3.98	1.28	23.00
1960	9.27	13.22	--	41.48	3	-14	12	4.74	2.95	-3.22
1961	10.74	15.10	--	43.13	3	-14	12	5.58	-1.23	10.20
1962	11.12	15.43	3.31	43.53	3	-14	12	6.80	0.83	-9.10
1963	10.65	14.66	3.47	44.90	3	-14	12	7.97	-0.41	11.61
1964	8.86	12.37	3.30	46.77	11	-2	7	8.18	-0.41	14.52
1965	12.42	16.85	3.76	42.83	11	-2	7	8.18	4.15	7.83
1966	10.97	15.32	3.83	38.57	11	-2	7	6.90	1.99	-6.59
1967	10.94	15.43	3.74	37.35	11	-2	7	7.33	3.12	-2.91
1968	9.95	14.32	3.49	36.48	11	-2	7	7.29	1.52	-0.88
1969	7.19	10.94	3.60	37.46	11	-2	7	7.00	2.99	-8.22
1970	7.89	12.23	3.78	38.60	11	-2	7	6.09	1.09	-18.20
1971	10.47	16.84	5.05	43.46	11	-2	7	7.88	0.73	11.79
1972	10.79	17.18	5.39	44.70	11	-2	7	10.96	1.07	2.90
1973	10.68	17.35	5.48	44.92	5	-2	5	10.98	9.86	-7.79
1974	9.66	16.42	4.99	45.47	5	-2	5	8.35	35.26	-25.06
1975	8.02	14.27	4.85	51.58	5	-2	5	8.24	6.87	-3.09
1976	11.01	17.72	4.88	56.19	5	-2	5	10.49	4.21	15.05
1977	10.93	18.31	5.41	61.58	5	-2	5	12.09	5.74	-13.66
1978	10.83	18.67	5.89	62.78	5	-2	5	10.39	4.23	-13.57
1979	10.80	19.14	5.93	65.89	5	-2	5	8.56	35.33	-5.81
1980	10.04	18.46	6.41	70.31	5	-2	5	7.99	38.94	-2.77
1981	9.49	18.10	7.44	72.87	10	3	5	8.72	11.40	-4.71
1982	9.31	17.82	9.64	85.85	10	3	5	9.04	-5.25	-9.08
1983	9.46	17.96	11.04	97.65	10	3	5	9.95	-3.31	26.84
1984	9.74	18.13	11.93	106.09	10	3	5	9.59	-1.51	-4.38
1985	9.17	16.80	12.48	121.54	10	3	5	9.33	0.82	9.37
1986	9.12	16.49	11.98	107.99	10	3	5	8.72	-21.88	31.62
1987	9.90	17.69	13.18	134.33	10	3	5	7.04	4.02	22.55
1988	10.53	18.34	12.20	143.77	10	3	5	6.29	0.87	-12.00
1989	11.06	18.86	12.80	156.60	10	3	5	4.95	9.39	17.33
1990	11.13	19.85	14.47	160.24	10	3	5	5.00	14.35	2.81
1991	10.96	20.45	15.19	169.83	10	3	5	4.09	-1.78	5.45
1992	11.16	20.14	15.72	183.88	10	3	5	2.81	-0.40	9.39
1993	11.39	20.05	18.16	232.70	10	3	5	2.06	-1.01	4.86
1994	9.87	17.91	18.17	241.21	10	3	5	1.17	0.51	5.53
1995	12.93	22.20	18.98	249.51	10	3	5	2.01	1.52	16.10
1996	13.43	23.39	22.09	242.46	10	3	5	3.09	6.30	25.08
1997	14.21	23.82	25.92	219.22	10	3	5	4.86	-0.09	27.44
1998	14.92	23.91	29.98	220.29	10	3	5	6.41	-13.18	13.80
1999	15.92	25.18	34.45	202.11	10	3	5	6.87	9.22	20.19
2000	17.07	25.22	46.04	218.72	10	3	5	7.01	28.40	0.24
2001	16.58	24.96	40.51	260.15	16	-3	6	7.60	-3.56	-7.66
2002	15.67	22.16	32.66	276.40	16	-3	6	7.73	-6.50	-10.79