
Asset prices, midterm elections and political uncertainty

Kam Fong Chan

University of Western Australia

Terry Marsh

Quantal International &
University of California, Berkeley

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Internet Appendix

This appendix contains robustness analysis and supplementary material to the main paper.

Online Appendix A: Data description

Table A1 describes all other data and variables used in the study, together with the data source. For example, we repeat the analysis of regression Eq. (2) using monthly data from 1816 to 2015 and report the results in Table 2 column (7) in the main text. This two-century of data includes pre-1871 midterms which are not held synchronously in November across all States in the U.S. We calculate the equity premium using the Goetzmann, Ibbotson, and Peng (2001) stock market monthly returns minus the risk-free rate. We follow Welch and Goyal (2008) and Golez and Koudijs (2018) and use the Commercial Paper rates for New York City and New England to instrument the pre-1871 risk-free rate, since the positive average equity premium estimated post-midterms would have been even higher had we assumed a zero risk-free rate prior to 1871.

We also repeat the above analysis by examining an even longer sample data by splicing Schwert's (1990) 1802–1925 data with the CRSP 1926–2015 value-weighted index. Geczy and Samonov (2016) note that Schwert's historical data set was spliced from various sources and hence the index was weighted differently over time (i.e., equally weighted prior to 1862, value weighted between 1863 and 1885 and price weighted from 1886 to 1925). On the other hand, Goetzmann, Ibbotson, and Peng's data, which is the subject of this study, was price weighted over the entire sample period and this alleviates issues related to a large bid-ask bounce effect that typically afflicts equally weighted index data. In addition, we analyze total returns on investable S&P 500 funds and on the front S&P 500 futures contract (these data series begin in the 1980s), addressing Dichtl and Drobetz's (2014) conjecture that transaction costs might diminish Presidential-cycle types of apparent equity anomalies.

Table A2 reports the results. In general, our finding of a much higher positive premium in equities and real economic indicators continue to hold.

Table A1

Variable descriptions, sample periods and data sources

This table describes the remaining variables used in the study, as well as the sample period and their data source. The acronyms shown in the ‘data source’ column are defined as follows: AER (<https://www.aeaweb.org/articles?id=10.1257/aer.20140913>), AG (Amit Goyal’s website at <http://www.hec.unil.ch/agoyal/>), DS (DataStream), FRED (<https://fred.stlouisfed.org/>), HS (Homer, S., and Sylla, R., 2005, A history of interest rates. John Wiley and Sons), NB (NBER Macrohistory database) ,QDL (www.quandl.com), RS (Robert Shiller’s website at <http://www.econ.yale.edu/~shiller/>) and SWT (William Schwert’s website at <http://schwert.ssb.rochester.edu/>).

Variable	Sample period	Data source	Description
Risk-free rate	1926-2015	CRSP	Ibbotson one-month treasury rate
	1871-1925	AG	Instrumented based on commercial paper rates for New York City as defined in Welch and Goyal (2008)
	1815-1870	NB & HS	Following Golez and Koudijs (2017), we use the resulting coefficient estimates of Welch and Goyal (2008) to predict monthly risk-free rate from 1815 to 1870. The predicted risk-free rate (y) is obtained from the following equation: $y = -0.004 + 0.886 \times \text{commercial paper rates (CPRs)}$, where CPRs are sourced from NBER Macrohistory database and Homer and Sylla (2005, Table 44).
GDP	1947-2015	FRED	Quarterly GDP official rate released by U.S. Bureau Economic of Analysis (BEA)
	1875-1946	AER	Quarterly real GDP series constructed by Owyang et al. (2013)
Industrial production	1919-2015	FRED	Monthly industrial production rate
Unemployment	1948-2015	FRED	Monthly unemployment rate
Employment	1948-2015	FRED	Monthly civilian employment level (in thousands of persons)
PAYEMS	1939-2015	FRED	Monthly total nonfarm payrolls (in thousands of persons)
Federal Funds rate	1954-2015	FRED	Monthly effective Federal Funds rate
CPI	1871-2015	RS	Monthly consumer price index rate
S&P funds	1988-2015	DS	S&P 500 Composite Total Returns index
S&P futures	1982-2015	QDL	S&P 500 Continuous Futures contract
Government sector	1947-2015	FRED	Real Government Consumption Expenditures and Gross Investment, in Federal, in defense, and in nondefense
Private sector	1947-2015	FRED	Real Gross Private Domestic Investments and Fixed Investments in Residential, in Non-Residential, in Non-Residential (Structures) and in Non-Residential (Equipment)
Schwert’s equity index	1802-1925	SWT	Schwert’s 1802-1925 monthly equity index

Table A2

Summary statistics for various financial and economic indicators surrounding midterm and Presidential elections

The table reports mean estimates of various financial and economic indicators over different intervals. The numbers in brackets are the p -values (computed from clustered standard errors) of the mean estimates. To ease readability, statistically significant estimates (i.e., those with p -values < 0.10) are highlighted in bold. The “ann” acronym means “annualized”. Dictated by data availability, the variables have different starting sample dates but they all end in 2015.

	Sample Period	Sample mean	Pre-election (Jun – Oct)			Post-election (Dec – Apr)			Post minus pre	
			Midterm (1)	Presidential (2)	Diff (1)-(2)	Midterm (3)	Presidential (4)	Diff (3)-(4)	Midterm (3)-(1)	Presidential (4)-(2)
Panel A: Equity securities										
Monthly excess returns on CRSP value-weighted index spliced with Goetzmann et al.’s equity index (ann., %)	1815-2015	1.72	-1.73 [0.67]	5.69 [0.15]	-7.42 [0.19]	11.70 [0.00]	0.88 [0.78]	10.82 [0.02]	13.44 [0.01]	-4.81 [0.34]
Monthly excess returns on CRSP value-weighted index spliced with Schwert’s equity index (ann., %)	1802-2015	4.27	1.41 [0.72]	8.55 [0.04]	-7.14 [0.20]	13.64 [0.00]	2.06 [0.51]	11.58 [0.01]	12.23 [0.01]	-6.49 [0.20]
Monthly excess returns on CRSP equal-weighted index (ann., %)	1926-2015	11.40	-7.15 [0.50]	13.69 [0.26]	-20.84 [0.19]	32.94 [0.00]	16.86 [0.03]	16.07 [0.13]	40.08 [0.00]	3.17 [0.82]
Monthly excess returns on DJIA (ann., %)	1896-2015	3.54	-2.62 [0.67]	10.15 [0.07]	-12.77 [0.12]	19.23 [0.00]	3.65 [0.41]	15.58 [0.02]	21.85 [0.01]	-6.50 [0.35]
Monthly excess returns on total returns of S&P500 funds (ann., %)	1988-2015	7.53	-3.07 [0.78]	-5.32 [0.70]	2.24 [0.90]	20.38 [0.01]	8.12 [0.23]	12.26 [0.18]	23.45 [0.07]	13.44 [0.37]
Monthly excess returns on S&P500 Futures (ann., %)	1982-2015	5.70	0.03 [0.99]	-3.97 [0.74]	4.00 [0.79]	21.74 [0.00]	7.18 [0.23]	14.56 [0.07]	21.70 [0.06]	11.15 [0.41]
Panel B: Treasury securities										
Monthly 5-year Treasury bond (ann., %)	1942-2015	1.60	4.43 [0.06]	3.52 [0.14]	0.92 [0.77]	0.63 [0.61]	0.50 [0.70]	0.13 [0.94]	-3.80 [0.14]	-3.01 [0.25]
Monthly 10-year Treasury bond (ann., %)	1942-2015	1.69	5.88 [0.08]	4.19 [0.16]	1.69 [0.69]	0.06 [0.98]	0.56 [0.78]	-0.50 [0.88]	-5.82 [0.13]	-3.64 [0.29]
Monthly 20-year Treasury bond (ann., %)	1942-2015	2.19	7.31 [0.05]	4.90 [0.19]	2.41 [0.63]	-0.79 [0.73]	-0.64 [0.81]	-0.15 [0.97]	-8.10 [0.06]	-5.55 [0.22]
Panel C: Real economic indicators										
Quarterly growth rates in real GDP (ann., %)	1947-2015	3.24	3.05 [0.00]	3.20 [0.00]	-0.15 [0.89]	3.92 [0.00]	3.00 [0.00]	0.92 [0.27]	0.87 [0.38]	-0.20 [0.84]
Quarterly growth rates in real GDP spliced with Owyang et al’s 1875-1946 GDP data (ann., %)	1875-2015	3.85	4.92 [0.00]	5.91 [0.00]	-0.99 [0.53]	4.46 [0.01]	2.52 [0.09]	1.95 [0.36]	-0.46 [0.81]	-3.39 [0.07]
Quarterly changes in real private spending (ann., %)	1947-2015	4.66	1.05 [0.62]	6.64 [0.00]	-5.59 [0.05]	6.57 [0.00]	4.43 [0.03]	2.14 [0.42]	5.52 [0.05]	-2.20 [0.42]
Quarterly changes in real private spending in Non-residential: Structure (ann., %)	1947-2015	2.54	-2.00 [0.29]	3.08 [0.08]	-5.07 [0.05]	4.89 [0.07]	2.82 [0.30]	2.08 [0.58]	6.89 [0.04]	-0.26 [0.94]
Quarterly changes in real private spending in Non-residential: Equipment (ann., %)	1947-2015	5.67	1.85 [0.54]	7.93 [0.01]	-6.07 [0.15]	8.35 [0.00]	5.31 [0.04]	3.04 [0.38]	6.50 [0.10]	-2.62 [0.48]
Quarterly changes in real private spending in Residential (ann., %)	1947-2015	4.32	5.28 [0.42]	2.94 [0.38]	2.34 [0.75]	10.43 [0.04]	2.08 [0.47]	8.35 [0.14]	5.15 [0.52]	-0.86 [0.84]

Quarterly changes in real government spending (ann., %)	1947-2105	2.89	3.49 [0.18]	3.33 [0.01]	0.16 [0.96]	5.49 [0.10]	3.13 [0.00]	2.36 [0.48]	2.00 [0.62]	-0.20 [0.90]
Quarterly changes in real government spending: Federal (ann., %)	1947-2015	2.95	6.61 [0.36]	2.35 [0.20]	2.26 [0.67]	8.06 [0.14]	3.17 [0.03]	4.88 [0.37]	3.45 [0.63]	0.82 [0.72]
Quarterly changes in real government spending: Defense (ann., %)	1947-2015	2.74	4.88 [0.48]	0.88 [0.65]	4.00 [0.57]	8.84 [0.17]	3.10 [0.08]	5.74 [0.38]	3.96 [0.67]	2.12 [0.38]
Quarterly changes in real government spending: Nondefense (ann., %)	1947-2015	6.52	5.49 [0.05]	7.52 [0.03]	-2.03 [0.62]	11.98 [0.04]	5.11 [0.11]	6.87 [0.29]	6.48 [0.30]	-2.41 [0.59]
Quarterly changes in real government spending: Local and State (ann., %)	1947-2015	3.16	2.56 [0.01]	4.17 [0.00]	-1.61 [0.21]	2.34 [0.00]	3.80 [0.01]	-1.46 [0.31]	-0.21 [0.84]	-0.36 [0.82]
Monthly growth rates in employment payroll (ann., %)	1939-2015	2.05	2.53 [0.01]	2.05 [0.01]	0.48 [0.67]	2.00 [0.00]	1.83 [0.06]	0.17 [0.87]	-0.53 [0.63]	-0.22 [0.84]
Monthly 10-year minus 3-mth Treasury term spread (%)	1871-2015	0.92	0.98 [0.00]	1.06 [0.00]	-0.08 [0.78]	0.97 [0.00]	0.83 [0.00]	0.14 [0.65]	-0.01 [0.97]	-0.23 [0.47]
Monthly Federal Funds rate (%)	1954-2015	5.00	5.01 [0.00]	4.86 [0.00]	0.14 [0.91]	4.46 [0.00]	5.19 [0.00]	-0.73 [0.58]	-0.55 [0.64]	0.33 [0.81]
Monthly 3-mth Treasury bill rate (ann., %)	1967-2015	3.69	3.60 [0.00]	3.60 [0.00]	0.00 [0.99]	3.51 [0.00]	3.80 [0.00]	-0.29 [0.63]	-0.09 [0.87]	0.20 [0.75]
Monthly changes in 3-mth Treasury bill rate (ann., %)	1967-2015	-0.00	0.03 [0.39]	0.09 [0.01]	-0.06 [0.24]	-0.05 [0.04]	-0.01 [0.60]	-0.04 [0.24]	-0.08 [0.07]	-0.11 [0.01]
Monthly changes in unemployment rate (%)	1947-2015	0.00	-0.01 [0.65]	0.01 [0.78]	-0.02 [0.59]	-0.02 [0.52]	0.03 [0.42]	-0.05 [0.31]	-0.01 [0.82]	0.02 [0.57]
Monthly changes in Federal Funds rate (bps)	1954-2015	-0.08	-5.18 [0.49]	1.29 [0.77]	-6.48 [0.45]	-8.83 [0.17]	3.12 [0.57]	-11.95 [0.15]	-3.64 [0.71]	1.82 [0.79]
Monthly growth rates in industrial production (%)	1919-2015	3.34	6.53 [0.09]	4.38 [0.04]	2.15 [0.61]	4.53 [0.02]	1.72 [0.54]	2.81 [0.44]	-2.00 [0.65]	-2.66 [0.44]

Online Appendix B: Cumulative wealth of two contrasting strategies

Figure B1 plots the cumulative wealth of two strategies in each Presidential cycle from 1871 to 2015: Strategy 1 that invests in equities at the end of November/beginning of December after the midterm and hold the position until April the following year, and Strategy 2 that invests in the equity market at the end of November/beginning of December after the Presidential election and holds it until April the following year. Each strategy begins with a \$1 investment. When we evaluate both strategies at the end of the investment horizon in April, the post-midterm Strategy 1 outperforms the post-Presidential Strategy 2 two-thirds of the time.

To explore whether our findings hold out-of-sample, we also evaluate two key events that occurred after the initial draft of this paper was circulated in the public domain: the 2016 Presidential election and the 2018 midterm election. Fig. B2, which is an analogue to Figure B1, displays the plots. The figure shows that the \$1 investment of strategy 1 initially dipped in December 2018, but eventually recovered to a level that matched the terminal wealth of strategy 2 by the end of the investment horizon.

Fig B1

Cumulative wealth of investing in the U.S. equity market following midterms versus following Presidential elections

This figure plots the cumulative wealth of an investor who adopts two mutually exclusive strategies in each Presidential cycle: Strategy 1 (black line) that invests in equities after the midterm election and hold it until end of April the following year, versus Strategy 2 (blue line) that invests in equities after the Presidential election and hold it until end of April the following year. Each strategy begins with a \$1 investment. Each panel is labelled with the Presidential election year. To facilitate interpretation, we highlight panels whose Strategy 1 has outperformed Strategy 2 at the end of the investment horizon in April with grey background.

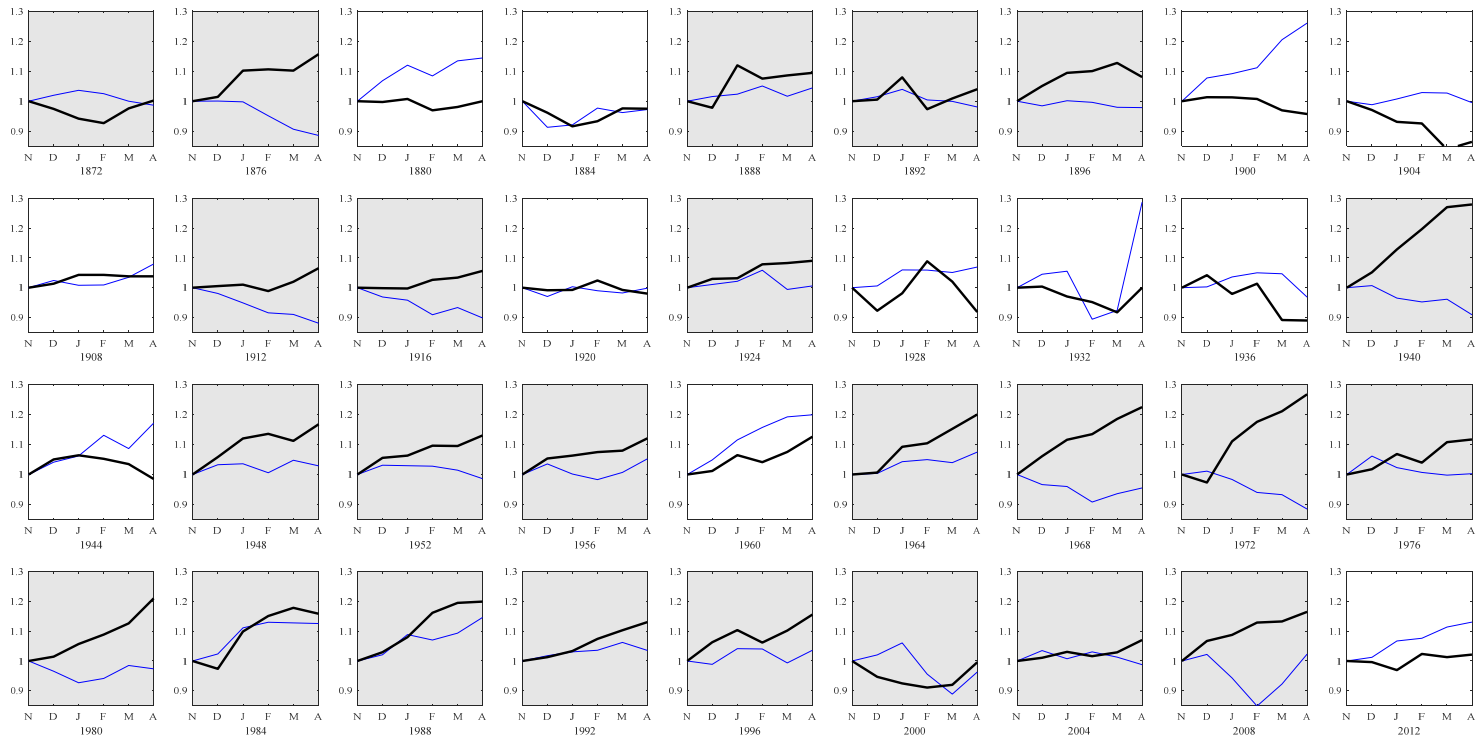
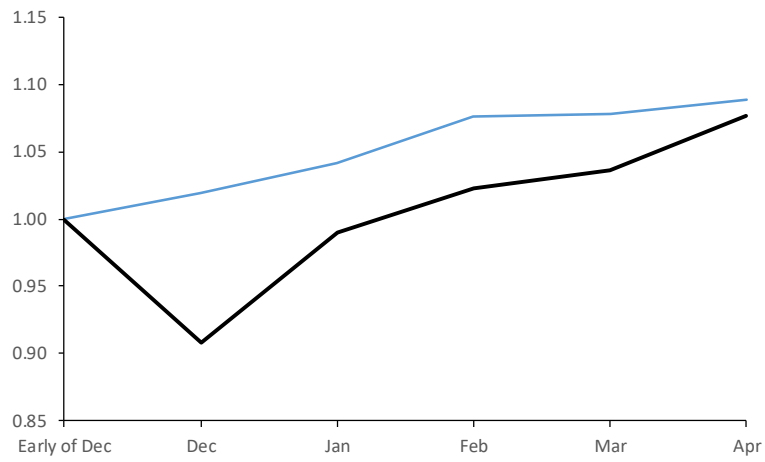


Fig B2

Cumulative wealth of investing in the U.S. equity market during President Trump’s administration

This figure plots the cumulative wealth of an investor who adopts Strategy 1 (black line) that invests in equities after the 2018 November midterm election and hold it until end of April the following year, versus Strategy 2 (blue line) that invests in equities after the 2016 November Presidential election and hold it until end of April the following year. Each strategy begins with a \$1 investment.



Online Appendix C: Macroeconomic news announcements

Savor and Wilson (2013), and Lucca and Moench (2015) report significantly higher U.S. equity premiums on days when pre-scheduled macroeconomic news announcements related to interest rates, unemployment and inflation are released. Hence, one might question whether the significantly positive M-P post-election gap is driven by “good economic news” announcements made disproportionately more frequently in post midterm months. To the contrary, though, we find that there is no conclusive evidence supporting this hypothesis: unexpectedly good macroeconomic news pertaining to the aforementioned variables account for 58% (46%) of all news surprises in months post midterm (Presidential) elections but this ratio is not statistically different from a random 50%-50% chance using the Binomial test.

Online Appendix D: Separate CAPM analysis for 10 beta-sorted portfolios, 10 industry portfolios and 25 size/book-to-market portfolios

Fig. 5 in the main text shows a plot of average excess returns against market beta for all 45 test portfolios, and Table 7 reports the corresponding results for Fama-MacBeth and panel regressions. Here, we repeat the analysis, separately, for ten beta-sorted portfolios, ten industry portfolios and 25 Fama-French portfolios sorted on size and book-to-market ratio. As before, the market risk premium is significant, both statistically and economically, in months following the midterms but it is largely flat in other months.

Table D

Fama-MacBeth and panel regression results for separate portfolios

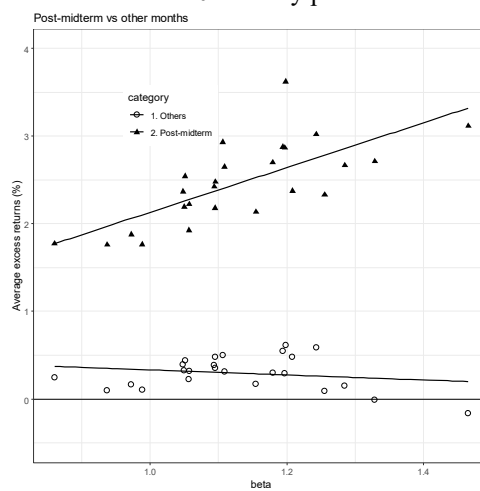
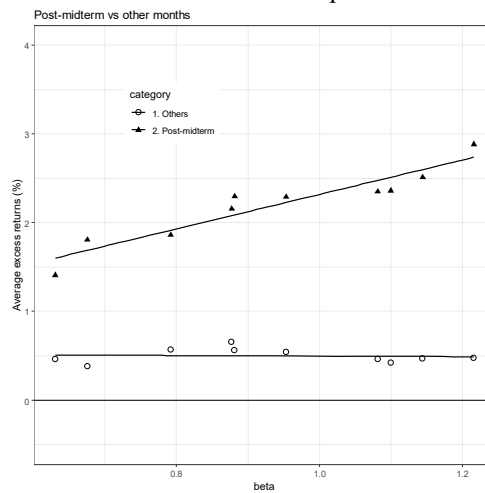
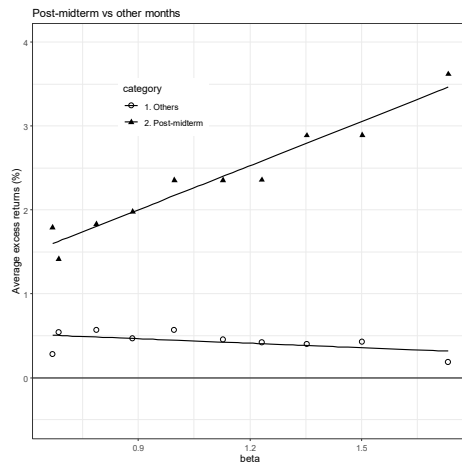
The left panel reports the results for Fama-MacBeth regression Eq. (6) of monthly excess returns on market betas in two separate occasions: (i) post-midterm months that extend from December after the midterm to April the following year, and (ii) in other months. The right panel reports the results for panel regression Eq. (7). The parenthesized t-statistics are estimated based on standard errors calculated using standard deviations of the time-series coefficient estimates (for the Fama-MacBeth regression) and standard errors clustered by months (for the pooled regression). Panel A reports the results for the 10 beta-decile value-weighted portfolios, Panel B reports analogous results for 10 industry portfolios and Panel C reports for Fama-French 25 size- and book-to-market portfolios. The sample period covers from 1937 to 2015. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Type of day	Fama-MacBeth			Pooled regression				
	Intercept	Beta	Avg R^2	Intercept	Beta	Mid	Mid*Beta	R^2
Panel A: 10 beta-sorted portfolios								
Post-midterm	0.17 (0.34)	1.99 (3.07)	0.413	0.70 (3.18)	-0.25 (-1.49)	0.33 (0.73)	1.47 (2.45)	0.011
Others	0.53 (3.32)	-0.13 (-0.55)	0.484					
Diff	-0.36 (-0.68)	2.12 (3.08)						
Panel B: 10 industry portfolios								
Post-midterm	0.40 (0.83)	1.85 (2.98)	0.218	0.71 (4.07)	-0.22 (-1.22)	0.39 (1.01)	1.40 (3.07)	0.010
Others	0.57 (3.43)	-0.11 (-0.50)	0.236					
Diff	-0.17 (-0.34)	1.96 (2.98)						
Panel C: 25 size- and BM-sorted portfolios								
Post-midterm	-0.02 (-0.03)	2.14 (3.05)	0.221	0.68 (0.67)	-0.34 (-0.41)	-0.45 (-0.22)	2.33 (1.32)	0.012
Others	0.54 (2.44)	-0.28 (-1.08)	0.219					
Diff	-0.56 (-0.89)	2.42 (3.24)						

Fig D.

Average excess returns against CAPM-beta for separate portfolios

The figure plots the average excess returns against equity betas in two separate occasions: (i) post-midterm months that extend from December after the midterm to April the following year (dark triangle-shaped points) and (ii) in other months (clear circle-shaped points). We superimpose an ordinary least squared best fitted line for each plot, and we use the same full-sample beta estimates in the plots. Panel A reports the results for the 10 beta-sorted portfolios, Panel B reports analogous results for 10 industry portfolios and Panel C reports for Fama-French 25 size- and book-to-market-sorted portfolios. The sample period extends from 1937 to 2015.



Additional references that are not cited in the main text

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