Online Appendix:

Capitol Losses: The Mediocre Performance of Congressional Stock Portfolios

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August 16, 2012

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A: Estimates from Previous Studies

Table A.1 shows annualized alpha returns (in %) for transaction-based portfolios as reported in Table 2 and Table 3 in Ziobrowski et al. (2004) and Ziobrowski et al. (2011) respectively. These estimates are used to construct the upper part of Figure 1 in the main paper.

Table A.1: Summary of (Ziobrowski et al.; 2004) and (Ziobrowski et al.; 2011): Annualized excess returns (%) on synthetic (transaction-based) portfolios of members of the Senate (1993-1998) and House (1985-2001), 12-month holding period

		Buys		**Sells**		**Hedged Portfolio**	
Sample	Model	Equal-Weighted	Trade-Weighted	Equal-Weighted	Trade-Weighted	Equal-Weighted	Trade-Weighted
Senate (1993-1998)							
Aggregated	CAPM	1.4	6.1	-3.8	-4.0	5.2*	10.1*
Aggregated	Fama French	3.9*	10.2*	-0.1	-2.4	4.0	12.5*
Average Member	CAPM	2.8	5.3†	-1.6	-0.5	4.4	5.8†
Average Member	Fama French	5.9†	6.8*	1.4	2.2	3.3	4.6
House (1985-2001)							
Aggregated	CAPM	-0.3	5.2*	-2.4†	3.7	2.1	1.5
Aggregated	Fama French	1.2	5.4*	-0.8	5.2*	2.0	0.2
Average Member	CAPM	-0.2	4.8*	NR	NR	NR	NR
Average Member	Fama French	1.4	5.4*	NR	NR	NR	NR

Note: NR=Estimates that are not reported in Ziobrowski et al. (2011). Grey shaded estimates are not reported in Ziobrowski et al. (2011), but computed using the reported buy minus sell estimates (see text for details).
†, $\star$, and $\star\star$ indicate significance at 10%, 5% and 1% level (two-sided tests).

B: Data Construction

In this section we describe how we constructed our data. As a result of the 1978 Ethics in Government Act, members of the U.S. Senate and House of Representatives are required to disclose their stock investments (as well as real estate and other investments, liabilities, and outside income and employment) and those of spouses and dependent children in annual filings known as Financial Disclosure Reports. We use the common stock holdings and transactions reported in the disclosure forms between January 2004 and December 2008 to reconstruct members' portfolios and then evaluate the performance of those portfolios using modern methods from empirical finance.

Our analysis includes all holdings and trades reported by members, including those owned by spouses and dependent children. Members may also choose to create qualified blind trusts, which are managed on their behalf and whose holdings are unknown to the member. In our data 20 members report qualified blind trusts. It is impossible to know from the disclosure forms how much a member personally directs his or her investments, but unless a member uses a blind trust it would be easy to pass on information to a money manager.

The Center for Responsive Politics transcribes these reports, beginning with 2004, and makes the data freely available on its website (`www.opensecrets.org`). We thus received the data as a pair of spreadsheets, one with a row for each of the 111,101 transactions recorded and another with a row for each of the 169,828 year-end holdings recorded. The first task in converting this raw data to stock portfolios was to identify the companies in which members hold stocks. The disclosure reports do not identify holdings in standardized ways (e.g. an investment in Bank of America common stock may be described as "Bank of America," "Bank America Common Stock," "Banc of America," or "BOA"); we used search utilities provided by Google Finance and the Center for Research on Security Prices (CRSP) as well as manual checks to link variously described assets to actual companies. Even more challenging, the descriptions may not precisely distinguish between stock holdings and other types of assets such as corporate bonds, mortgages, auto loans, or bank accounts. To reduce the risk of misclassifying savings accounts and other financial instruments as stock investments, we hand-checked the disclosure report for each apparent financial stock to attempt to distinguish stocks from other types of assets based on other clues in the forms, such as columns reporting dividend or investment income.

The next task was to impute a dollar value for each holding and trade reported. Members are only required to report the value of their investments in broad value bands (e.g. \$15,000 – \$50,000) rather than exact dollar amounts.[1] In order to impute precise values for investments reported in these bands, we took advantage of the fact that we do know the precise value of a sizable minority of reported investments — those cases in which a member submitted an annual statement from a bank or investment manager rather than filling out

[1]Value band cutpoints are at \$1,000, \$15,000, \$50,000, \$100,000, \$250,000, \$500,000, \$1,000,000, \$5,000,000, \$10,000,000 and \$25,000,000, and a top category captures all investments of \$50,000,000 or more in value.

the official forms.[2] We used these investments to fit a distribution of precise values and, for each investment for which we know only the band, we impute the expected value of the precise-value distribution within that band.[3] For the highest band (investments over $50,000,000), of which there are fewer than 100 holdings and 5 trades in our estimation sample, we impute the value of $50,000,000.

Having linked each holding and trade to a company and imputed dollar values, it remained to reconstruct the day-by-day stock portfolio. Our approach in reconstructing a portfolio from the disclosure reports was to start at the last day of each year, for which the reports provide the entire portfolio (i.e. the year-end holdings), and work backward to the beginning of the year, adjusting the portfolio each day to reflect purchases and sales as well as fluctuations in value due to security price changes. (In other words, each portfolio is rebalanced on a daily basis.[4]) For example, suppose a member reported holding $10,000 of stock in Company A at the end of the year and reported purchasing $5,000 of stock in Company A on June 1. This member's portfolio on January 1 of that year is estimated by calculating what $10,000 in Company A stock was worth on June 1 (based on the return between June 1 and the end of the year), subtracting $5,000, and then calculating what that value was worth on January 1. In this way we calculate dollar value holdings for every member of every stock on each day between January 1, 2004 and December 31, 2008.

[2]This information is available for about 25% of the transactions in the dataset and about 8% of the year-end holdings. The members who reported exact values tended to have larger portfolio sizes overall, but there is no reason to think that within value bands the value of their assets and transactions would differ greatly from those of members who did not report exact values. Consistent with this, when we redo the imputation with a subset of members who report exact values and who are matched to members not reporting exact values, the imputed values differ hardly at all from those imputed based on the full sample of members who report exact values.

[3]This approach is inspired by the imputation method proposed in Milyo and Groseclose (1999).

[4]Barber and Odean (2000) show that ignoring intra-month timing of trades makes little difference in their overall return calculations, but we see no reason not to calculate daily returns, particularly given the short time-frame in which information arbitrage would likely take place.

C: Descriptive Statistics

In the right panel of Table C.1 we present summary statistics describing the stock transactions of members in our dataset; for each member, we calculate the value and number of transactions in each year and then average across years to get member-level yearly averages. As in the period covered by Ziobrowski et al. (2004) and Ziobrowski et al. (2011), the distribution of annual transactions across members is quite right-skewed: the average member buys and sells 18 and 22 stocks per year (respectively), worth about $402,000 and $619,000; the median member buys and sells 2 and 3 stocks worth about $17,000 and $40,000.

The left panel of Table C.1 displays the summary statistics for the annual averages of member portfolios for the 2004–2008 period. Member portfolio sizes range from $501 (for a member who reported a single stock in the lowest value band) to $140 million, the average reported by Jane Harman. Just as with the stock transactions, the distribution of stock holdings is strongly skewed: the median member on average holds stocks worth about $93,000 in 5 companies, while the average member holds about $1.7 million in 19 companies.

Table C.1: The common stock holdings and transactions of members of Congress - annual averages 2004-2008

	Holdings		Annual Transactions			
			Buys		Sells	
	$ Value	Number	$ Value	Number	$ Value	Number
Min	501	1	0	0	0	0
25th Percentile	26,424	2	0	0	11,010	1
Median	93,827	5	17,656	2	39,636	3
75th Percentile	451,169	21	105,960	9	186,068	11
Max	140,767,979	331	32,253,189	424	47,615,848	479
Mean	1,718,091	19	401,744	18	618,942	22

Note: Summary statistics are annual (aggregated) averages across the 2004-2008 period based on end-of-year financial disclosure reports for 422 members of Congress that report holding common stocks between 2004 to 2008. Values are reported in bands and imputed based on a log-normal model that was fitted to each value band for the group of members that report exact amounts within each band (see text for details).

D: Additional Results

Robustness Checks For Transaction-based Portfolio Analysis

In Table 1 in the main text we report estimates for the transaction-based portfolio analysis that replicate the approach used in Ziobrowski et al. (2004) and Ziobrowski et al. (2011) for a more recent time period. Here, we extend that approach in order to check robustness and shed further light on trading performance in Congress.

First, rather than converting value bands specified on the disclosure reports to precise dollar values using midpoints as in Ziobrowski et al. (2004) and Ziobrowski et al. (2011), we attempt to more precisely record transaction values by adopting an imputation method that takes advantage of the fact that many members report exact dollar values (see Appendix A for a description of the imputation methodology). Second, we construct synthetic transaction-based portfolios based on not just 255-day holding periods but also 1-day, 10-day, 25-day, and 140-day holding periods, allowing us to detect more short-term trading gains. Third, we estimate the alpha excess returns using the CAPM but also the Four-Factor Carhart model, an extension of the Fama-French Three-Factor model that adds a momentum factor to the Three-Factor Fama-French model used above. The momentum factor, MOM_t, is the return on a hedged portfolio that is long in companies with the best performance in the previous year and short in the companies with the worst performance in the previous year (Carhart; 1997). The results are displayed in Table D.1

Regardless of the approach used, we find that the trades of members of Congress are not particularly well-timed. With some combinations of holding period, model, and weights we find evidence of good or bad trading acumen, but the overall results are again consistent with the null hypothesis of zero excess returns.

Table D.1: Monthly Excess Returns (%) on synthetic (transaction-based) portfolios for members of Congress (2004-2008), various holding periods.

	Holding	Aggregate Portfolio			Average Portfolio		
	Period	Buys	Sells	Long/Short	Buys	Sells	Long/Short
CAPM	1 Day	0.431	1.344†	-0.913	0.805	1.215	-0.411
		(0.742)	(0.806)	(1.047)	(0.570)	(0.837)	(0.992)
Carhart 4 Factor		0.531	1.279†	-0.749	0.849	1.195†	-0.346
		(0.770)	(0.657)	(0.905)	(0.562)	(0.699)	(0.843)
CAPM	10 Days	-0.727	0.312	-1.039†	-0.113	0.270	-0.383†
		(0.540)	(0.263)	(0.603)	(0.201)	(0.183)	(0.208)
Carhart 4 Factor		-0.691	0.314	-1.005	-0.036*	0.312	-0.348
		(0.535)	(0.253)	(0.629)	(0.235)	(0.160)	(0.213)
CAPM	25 Days	-0.352	0.134	-0.486	0.228	0.184	0.044
		(0.488)	(0.277)	(0.358)	(0.223)	(0.154)	(0.189)
Carhart 4 Factor		-0.320	0.161	-0.481	0.251	0.181	0.070
		(0.458)	(0.270)	(0.344)	(0.213)	(0.144)	(0.184)
CAPM	140 Days	-0.055	-0.220†	0.165	-0.170	-0.163	-0.006
		(0.190)	(0.114)	(0.187)	(0.185)	(0.122)	(0.163)
Carhart 4 Factor		-0.025	-0.249*	0.224	-0.169	-0.190†	0.020
		(0.193)	(0.107)	(0.189)	(0.164)	(0.115)	(0.129)
CAPM	255 Days	-0.190	-0.098	-0.092	0.005	-0.111	0.116
		(0.144)	(0.085)	(0.169)	(0.184)	(0.122)	(0.139)
Carhart 4 Factor		-0.149	-0.141*	-0.008	-0.017	-0.172	0.155
		(0.131)	(0.075)	(0.138)	(0.191)	(0.120)	(0.117)

Note: Monthly alpha returns in % (with robust standard errors in parenthesis) for calendar time portfolios that mimics the value-weighted and equal member weighted investments in stocks bought or sold by members over the 2004-2008 period. Results are reported for fixed holding periods of 1 day, 10 days, 25 days, 140 days, and 255 days. Within reported value bands, dollar values are imputed using the lognormal model as described in the main text. Long-short is the monthly average return of a zero cost portfolio that holds the portfolio of bought stocks and sells short the portfolio of sold stocks. CAPM alpha is the result from a time-series regression of the portfolio excess return (i.e. raw return minus risk-free rate) on the market excess return. Carhart 4 Factor alpha is the result from a time-series regression of the portfolio excess return on the three Fama and French (1993) mimicking portfolios and the Carhart momentum factor.

†, $\star$, and $\star\star$ indicate significance at 10%, 5% and 1% level (two-sided tests) for excess returns.

Excess Returns From CAPM

Table D.2 contains our replication of Table 2 in the main text using the CAPM model. The findings are similar to Table 2 which uses the Carhart 4-Factor model.

Table D.2: Monthly excess Returns (%) for Stock Investments of Members of Congress 2004-2008 estimated with CAPM

Dependent Variable	Risk-Adjusted Monthly Portfolio Return ($R_{i,t} - R_{f,t}$)												
Mean	-.39												
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	All	Party		Chamber		Power Committee			Party & Committee Leaders			Period	
	Members	Dems	Reps	House	Senate	House	Senate	None	House	Senate	None	2004-06	2007-08
$R_{m,t} - R_{f,t}$	0.96	0.96	0.96	0.95	1.00	0.94	0.95	0.98	1.01	1.02	0.94	0.96	0.92
	(0.05)	(0.04)	(0.06)	(0.05)	(0.05)	(0.07)	(0.05)	(0.04)	(0.09)	(0.04)	(0.05)	(0.03)	(0.06)
Alpha	-0.27*	-0.36*	-0.18	-0.30*	-0.14	-0.33*	-0.11	-0.26*	-0.53*	-0.24*	-0.23†	-0.06	-0.70*
	(0.12)	(0.14)	(0.13)	(0.13)	(0.12)	(0.17)	(0.13)	(0.12)	(0.23)	(0.12)	(0.12)	(0.08)	(0.26)
Obs	18,388	8,621	9,754	14,475	3,808	6,847	2,637	8,904	2,266	2,062	14,060	11,818	6,570
Annualized Alpha	-3.24*	-4.32*	-2.16	-3.6*	-1.68	-3.96*	-1.32	-3.12*	-6.36*	-2.88*	-2.76†	-0.72	-8.4*
Model	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
		Seniority			Portfolio Size			Net Worth			Pre-Congressional Career		
	Low	Medium	High	Low	Medium	High	Low	Medium	High	Business	Lawyer	Politician	Other
$R_{m,t} - R_{f,t}$	0.94	0.93	1.00	0.96	0.97	0.95	0.96	0.98	0.94	0.99	0.99	1.01	0.93
	(0.05)	(0.06)	(0.06)	(0.07)	(0.06)	(0.03)	(0.08)	(0.04)	(0.05)	(0.04)	(0.07)	(0.06)	(0.05)
Alpha	-0.33*	-0.21	-0.26	-0.18	-0.35*	-0.25**	-0.42*	-0.12	-0.29*	-0.03	-0.26	-0.30†	-0.28*
	(0.13)	(0.13)	(0.16)	(0.18)	(0.15)	(0.08)	(0.19)	(0.11)	(0.12)	(0.19)	(0.19)	(0.17)	(0.12)
Obs	5602	7171	5615	5422	6388	6578	5422	6483	6470	1131	2650	3407	11200
Annualized Alpha	-3.96*	-2.52	-3.12	-2.16	-4.2*	-3.00**	-5.04*	-1.44	-3.48*	-0.36	-3.12	-3.6†	-3.36*

Note: Table shows results from analysis using the monthly returns (in %) of the holdings-based calendar-time portfolios of all members of Congress that report holding common stocks during the 2004-2008 period. The dependent variable is monthly risk adjusted return of a Member's holdings $R_{i,t} - R_{f,t}$ (where $R_{f,t}$ is the risk-free return from Ken French's website). Portfolios are based on information reported in end-of-year financial disclosure reports (see text for details). Controls are the market excess return ($R_{m,t} - R_{f,t}$). Rogers standard errors (clustered by month) are provided in parenthesis. Models 1 present the regression for the sample of all members. Models 2-26 report regression results for selected subgroups of members. Power committees in the House are defined as Rules, Appropriations, Ways and Means, and Commerce; in the Senate as Appropriations, Finance, and Commerce. Party leaders include leader and whip of the majority and minority in the House and Senate, plus the Speaker of the House and the President Pro Tempore in the Senate. Committee leaders include committee chairmen and ranking members, along with vice-chair. Stratifications for seniority, portfolio size, and net worth are based on equally sized bins. Pre-congressional careers are classified based on Carnes (2010) into Business Owners, Lawyers, State or Local Politicians, and Other careers. A member is classified as belonging to an occupational category if he spent more then 60 % of his pre-congressional career in that category.
†, ⋆, and ⋆⋆ indicate significance at 10%, 5% and 1% level (two-sided tests) for excess returns.

Excess Returns With Monthly Aggregated Data

Tables D.3 and D.4 replicate the analysis of Table 2 using aggregated data, as explained in the text. Briefly, in place of our panel regressions, which estimate the average alpha across members-months, we carry out regressions that model the average monthly return on a single portfolio that is created by aggregating member returns. For the Aggregate Congressional Portfolio the average monthly return is computed using a value-weighted average across members; for the Average Congressional Portfolio member returns are equal-weighted across members.

Table D.3 provides the results of our estimates of the abnormal return on the Congressional portfolio. Panel A shows that the average monthly excess returns for the aggregate Congressional portfolio is negative and significant at conventional levels in both the CAPM and Carhart 4-Factor specifications. The same is true for the the average Congressional portfolio shown in Panel B. The excess return estimates are very similar. For the CAPM, the magnitudes suggest that the aggregate Congressional portfolio underperforms the market by an average of about .27 percentage points per month, which annualizes to a yearly excess return of about -3.2% with a .95 confidence interval of $-5.5; -.95$; the average Congressional portfolio underperforms the market by an average of about .31 percentage points, which annualizes to a yearly excess return of about -3.8% $[-6.0; -1.5]$. The corresponding annualized figures for the 4-Factor model are -2.8% $[-5.2; -.5]$ and -3.1 % $[-5.1; -1.2]$.

Table D.3: Monthly excess returns (%) for Aggregate/Average Congressional Portfolio

	Excess	Coefficient Estimate on:				Adjusted
	Return	$(R_{m,t} - R_{f,t})$	SMB_t	HML_t	MOM_t	R^2
Panel A: Monthly Alpha Returns for Aggregate Congressional Portfolio						
CAPM	-0.269**	0.925				0.96
	(0.095)	(0.038)				
Carhart 4-Factor	-0.239*	0.920	-0.040	0.076	-0.065	0.96
	(0.099)	(0.037)	(0.053)	(0.055)	(0.037)	
Panel B: Monthly Alpha Returns for the Average Member						
CAPM	-0.319**	0.979				0.96
	(0.093)	(0.032)				
Carhart 4-Factor	-0.263**	0.933	0.081	0.090	-0.125	0.98
	(0.080)	(0.025)	(0.042)	(0.042)	(0.030)	

Note: Table shows results from analysis using the monthly aggregate or average returns (in %) of the holdings-based calendar-time portfolios of all members of Congress that report holding common stocks during the 2004-2008 period. The dependent variable is monthly risk-adjusted return obtained from aggregating the monthly portfolio returns across members. N=60. Panel A presents results for the gross monthly return on a portfolio that mimics the aggregate investments of all members of Congress (value-weighted). Panel B presents results for the gross return on a portfolio that mimics the investment of the average member of Congress (equal member weighted). CAPM is the result from a time-series regression of the member excess return on the market excess return $(R_{m,t} - R_{f,t})$. Carhart 4-factor is the result from a time-series regression of the member excess return on the Fama and French (1993) mimicking portfolios (the market excess return, a zero-investment size portfolio (SMB_t), a zero-investment book-to-market portfolio (HML_t)) and the Carhart (1997) momentum factor (MOM_t). Robust standard errors are presented in parentheses.
†, $\star$, and $\star\star$ indicate significance at 10%, 5% and 1% level (two-sided tests) for excess returns.

Table D.4 reports the estimated excess returns across selected member subgroups using the aggregated data approach. The results are very similar to the results from the panel regression. The only noticeable exception is that the aggregate portfolio of prior business owners beat the market in some specifications. Other than that all subgroups consistently underperform.

Table D.4: Monthly Excess Return (%) for Selected Subgroups

	Aggregate Portfolio Alpha Return		Average Member Portfolio Alpha Return	
	CAPM	4-Factor	CAPM	4-Factor
Democrats	-0.344**	-0.304*	-0.300*	-0.225†
	(0.122)	(0.126)	(0.143)	(0.118)
Republicans	-0.152	-0.163	-0.174	-0.107
	(0.143)	(0.139)	(0.156)	(0.105)
House	-0.212†	-0.170	-0.272†	-0.194†
	(0.128)	(0.134)	(0.155)	(0.114)
Senate	-0.334**	-0.336**	-0.103	-0.081
	(0.122)	(0.129)	(0.128)	(0.121)
Power Committee House	-0.173	-0.088	-0.300	-0.184
	(0.146)	(0.144)	(0.223)	(0.149)
Power Committee Senate	-0.293*	-0.248†	-0.089	-0.069
	(0.139)	(0.134)	(0.095)	(0.105)
No Power Committee	-0.274*	-0.309*	-0.244*	-0.196*
	(0.117)	(0.142)	(0.110)	(0.080)
2004-2006	-0.172†	-0.255*	-0.188**	-0.190*
	(0.098)	(0.110)	(0.067)	(0.096)
2007-2008	-0.296†	-0.216	-0.563**	-0.329*
	(0.178)	(0.222)	(0.196)	(0.161)
Seniority Low	-0.088	0.001	-0.313*	-0.219†
	(0.129)	(0.127)	(0.143)	(0.132)
Seniority Medium	-0.569**	-0.625**	-0.187	-0.159
	(0.150)	(0.167)	(0.150)	(0.115)
Seniority High	-0.273	-0.322*	-0.211	-0.121
	(0.168)	(0.156)	(0.161)	(0.102)
Portfolio Size Low	-0.606**	-0.518*	-0.127	-0.058
	(0.230)	(0.229)	(0.202)	(0.162)
Portfolio Size Medium	-0.395**	-0.405**	-0.307†	-0.219†
	(0.114)	(0.121)	(0.171)	(0.132)
Portfolio Size High	-0.259**	-0.243*	-0.257**	-0.211**
	(0.095)	(0.097)	(0.090)	(0.055)
Net Worth Low	-0.643**	-0.533**	-0.312	-0.210
	(0.185)	(0.168)	(0.222)	(0.166)
Net Worth Medium	-0.270**	-0.325**	-0.100	-0.077
	(0.087)	(0.088)	(0.118)	(0.108)
Net Worth High	-0.272**	-0.261*	-0.277*	-0.220**
	(0.102)	(0.103)	(0.131)	(0.082)
Former Business Owners	0.467	0.532	-0.026	0.071
	(0.332)	(0.362)	(0.198)	(0.167)
Former Lawyers	-0.245	-0.405†	-0.213	-0.286†
	(0.231)	(0.239)	(0.186)	(0.150)
Former Local Politicians	-0.516**	-0.451*	-0.279	-0.142
	(0.173)	(0.203)	(0.176)	(0.167)
Other Pre-Congressional Careers	-0.223*	-0.192†	-0.246†	-0.168
	(0.109)	(0.103)	(0.143)	(0.106)

Note: Alpha returns (in %) for selected subgroups with robust standard errors in parentheses. Aggregate returns/Average member returns are for portfolios that mimics the aggregate investments of all members/investments of the average member in a specific group respectively. Alpha returns from the CAPM are estimated with a time-series regression of the members' monthly excess return on the monthly market excess return. The Carhart 4-factor adds the Fama and French (1993) mimicking portfolios and the Carhart (1997) momentum factor as controls.
†, ⋆, and ⋆⋆ indicate significance at 10%, 5% and 1% level (two-sided tests) for excess returns.

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