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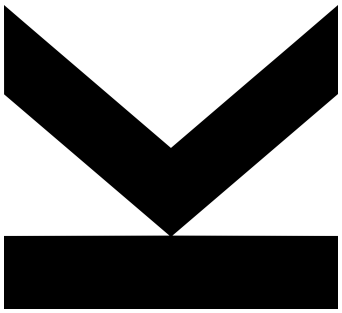
Stock Returns over the FOMC Cycle Revisited



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To myself, respectivly.

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1 Motivation

The starting point of this thesis is recently conducted research that studies the link and possible causal effects between monetary policy decisions by the FED and the stock market in the U.S., not only in an ex-post but also in an ex-ante sense.

The paper Stock Returns over the FOMC Cycle (Cieslak et al.) finds a pattern in financial markets around the world that suggests that stock market excess returns in the last 23 were entirely earned in even weeks (0, 2, 4 and 6) starting from the last FOMC meeting. The authors tie their findings to a known phenomenon called "Fed Put", by which they mean accommodating monetary policy.

In a follow-up paper, The Economics of the FED Put (Cieslak and Vissing-Jorgensen) the authors use textual analysis of FOMC (Federal Open Market Commitee) scripts to identify and measure the causal effect that policymakers indeed pay intention to the stock market, especially since the mid-1990s and stock market performance is linked with the FED's internal growth projections. The authors further claim that even if the policymakers seem to be aware that a dynamic like the FED put could induce risk-taking behavior leading to moral-hazard implications, it does not particularly affect their decision-making in an ex-ante sense.

In my thesis, I aim to find out whether the financial pattern regarding stock excess returns in FOMC even weeks is still relevant from 2016 onwards (probably complicated by the COVID-19 crisis) since the paper published in 2019 only investigates this pattern before 2019. Additionally, the authors prove the relevance of their financial pattern worldwide using exchange-traded funds (ETFs) containing European stocks. I want to include further results with a specific focus on European stock returns.

2 What is the "Fed Put" and how can it be explained?

2.1 The FED Put

The "Fed put" in general refers to a strong accommodating monetary policy by Federal Reserve (FED). In case of sharp decline in asset prices the FED is expected by the market (its investors) to intervene. (**FED_Put_dynamic_explained**) This term is referring to the concept of a "put option" in asset markets which gives the holder the right to sell at a predetermined price. Therefore, the Fed put would protect an investor from the decline in the value of an asset. The related term "Greenspan Put" is often used to describe the monetary policy of the Federal Reserve under the leadership of former Chairman Alan Greenspan, to intervene in financial markets in order to prevent significant declines or disruptions. Some argue that market interventions are necessary to prevent financial crises (like the Dot-com-bubble burst in 2001 or Lehmann Brothers in 2008), while others believe that these interventions distort the market and create moral hazards. (**cieslak_economics_2020**) The role as the lender of last resort function of the FED has initially been established to provide liquidity to the financial system during times of stress or crisis. (**The role as the lender of last resort function**) This role means that the FED stands ready to lend money to financial institutions to prevent systemic collapse. However, a monetary dynamic like the "Fed put" goes beyond the lender of last resort function, as it suggests that it will also intervene in the markets to prevent a steep decline in asset prices. Therefore, some believe that the Fed put has created a moral hazard in the markets. (**FED moral hazard**) This means that investors are willing to take on excessive risks because they believe that the Federal Reserve will always come to rescue them. Some investors believe that such believes can lead to financial crises in the long run.

2.2 Stock Returns over the FOMC Cycle

Diving further into causes for dynamics like the Fed put, recent papers like “Stock returns over the Federal Open Market Committee (FOMC) cycle” focused on a FOMC cycle specific pattern of the equity premium since 1994. The calculated stock excess returns use Research Portfolio Data provided by Fama/French(**Fama/French Factors**) for convenience, which represent the return earned by holding stocks over other risk-free assets (like bonds) The stock returns exhibit a distinct patterns within the FOMC cycle. Notably, it primarily accrues in weeks 0, 2, 4, and 6 within the FOMC cycle weeks (For explaination of the FOMC cycle see figure 3.1 on page 6.

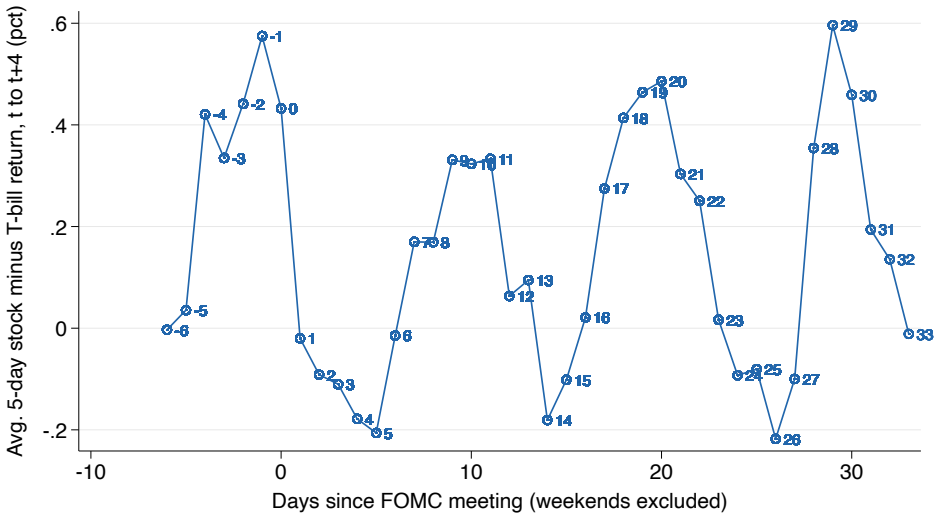

Figure 2.1: cies19 - Fig1

The authors present three distinct trading strategies (A, B, and C) that shed light on the influence of the FOMC cycle on stock market returns. Of particular note is Strategy A, which involves exclusively holding stocks during even FOMC cycle weeks, a strategy conveniently implementable through Exchange-Traded Funds (ETFs). This strategy demonstrates that the average annual returns more than double compared to holding an ETF throughout the entire FOMC cycle. Intriguingly, the authors find that holding an ETF during uneven FOMC weeks results in financial losses over the examined period from 1994 to 2016. The authors extend their analysis to explore whether the FOMC cycle return pattern extends beyond the United States, potentially influenced by movements

of the dollar currency. To investigate this, they use ETFs containing globally diversified stocks. To establish causality, the authors compare FOMC cycles with other macroeconomic news calendars (e.g. Bloomberg macroeconomic news), dispelling the notion that macroeconomic news significantly correlates with FOMC cycle calendars. They also provide evidence that the release of quarterly firm profits does not substantially account for the observed equity premium patterns over the FOMC cycle. To establish a causal link between the FEDs policy measures and stock market behavior, the authors study intermeeting target changes, Fed funds futures, and internal Board of Governors meetings. The authors suggest significant influence by the FED over the stock market through its accommodating policies, leading to reductions in the equity premium. Moreover, they argue to uncover evidence of systematic informal communication channels between Fed officials and the media and financial sector, serving as a channel through which news about monetary policy has reached the market.

2.3 The Economics of the FED Put

The follow-up paper The economics of FED put" by (Cieslak and Vissing-Jorgensen)" further tries to study the economics of the relationship between FED policy and the stock market. The authors compare the stock market as predictive power to other economic indicators to predict changes of the Federal Funds Rate (FFR) by using textual analysis from former Federal Open Market Committee (FOMC) meeting transcripts. Their findings affirm the FED indeed pays a lot of attention to the stock market during market downturns.

They argue that the fed put is fueled by the Federal Reserve's concerns about the consumption wealth effect. Conversely, a strong stock market performance corresponds to updates of the FED's internal growth projections. Empirical evidence substantiates their claims, as multiple regressions on changes in the Federal Funds Rate (FFR) demonstrate that the stock market captures a higher proportion of the variance (R-squared) compared to other macroeconomic indicators. Significantly, this relationship appears to be less pronounced before the 1990s period. During the third European Central Bank (ECB) research conference, valuable comments on the econometric approach used by the authors were made by the discussant.

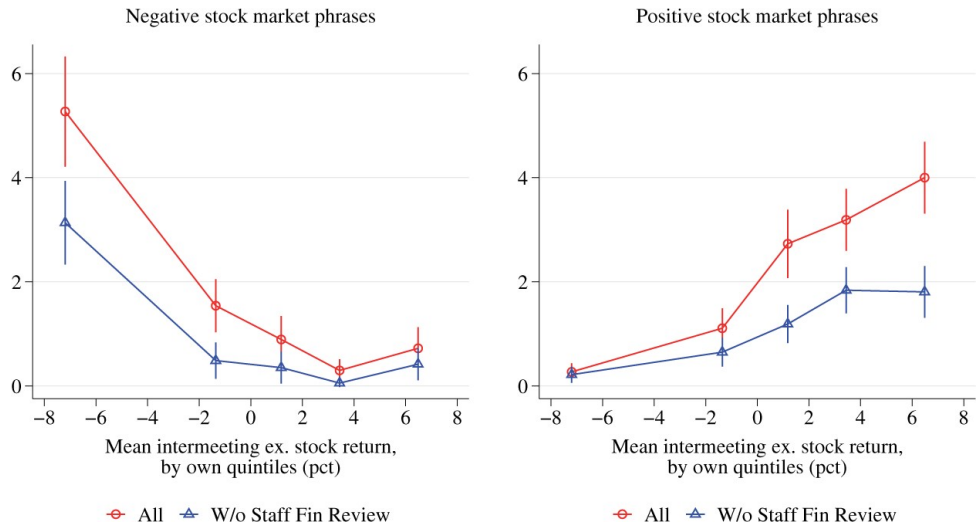

Figure 2.2: cies21 - Fig6

Emmanuel Moench, the former head of research at Deutsche Bank. Moench's suggests that the correlation between negative stock excess returns and the Federal Funds Rate is heavily influenced by two specific FOMC meetings (during financial crises like the dot-com bubble burst in 2001 and the 2008 financial crisis). Furthermore, he recommended incorporating additional covariates, including consumer confidence news and credit spreads, into the regression models to enhance their explanatory power. Moench sees the stock market as one of several co-factors influencing Federal Reserve policy (presumably over the updates of the FEDs growth projections as stated by the authors), rather than a dominant driver of the FEDs policy.

3 Stock returns over the FOMC Cycle Revisited

3.1 The FOMC cycle

The FOMC (federal market open committee) meets approximately every eight weeks during the year, which results in a FOMC cycle time of approximately 7 weeks (excluding weekends) at most times since a year has 52 weeks. The authors therefore define FOMC cycle time week dummy variables for week 0 as days -1 one to 3, week 1 as days 4 to 8, till week 6 as days 29 to 33. Worthwhile to mention is that the authors drop 3 days which would be in FOMC cycle week 7 from their investigation and that the number of available data points for decreases for FOMC dummies (meaning 920 days in week 0, 924 days in week 2, 831 days in week 4, 120 days in week 6 for the relevant timespan from 1994 till 2016)

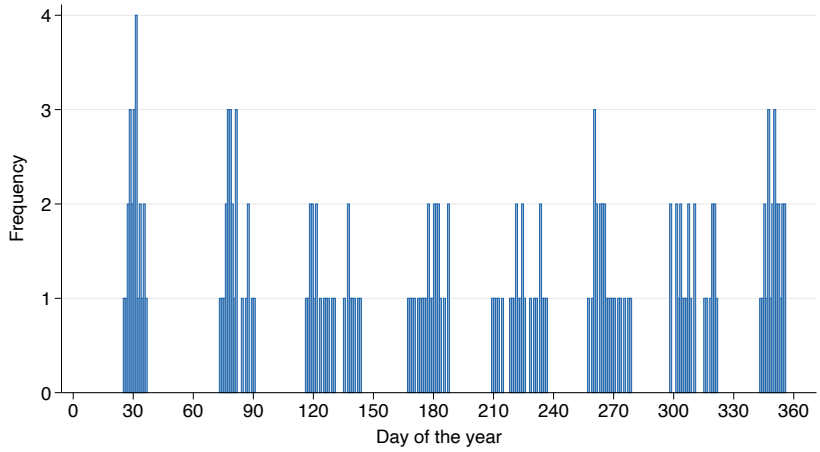

Figure 3.1: cies19 - Fig2

3.2 FOMC data

3.3 Linear Regression with FOMC dummy variables

One relevant linear regression model with FOMC cycle week as in (Cieslak et al.) can be defined as:

$$rxpct_i = \hat{\beta_0} + D_0 * \hat{\gamma_1} + D_1 * \hat{\gamma_2} + \epsilon_i \tag{3.1}$$

where $\hat{\beta_0}$ is the OLS-estimated intercept, $\hat{\gamma_1}, \hat{\gamma_2}$ the OLS-estimated parameters, rx_i the excess returns as calculated like in chapter 3.3.,

$$D_0 = \begin{cases} 1, & \text{if in the 0 week within FOMC cycle time.} \\ 0, & \text{otherwise} \end{cases} \tag{3.2}$$

the FOMC cycle dummy for week 0,

$$D_1 = \begin{cases} 1, & \text{if in the 2,4 or 6 week within FOMC cycle time.} \\ 0, & \text{otherwise} \end{cases} \tag{3.3}$$

the FOMC cycle dummy for week 2,4, 6 and $\epsilon_i \sim i.i.d. \mathcal{N}\left(0, \sigma^2\right)$ are independent identically distributed OLS-estimated standard errors.

3.4 Replication with FOMC data (from 2016 onwards)

3.4.1 FOMC dummy generation

The R Code in `generate_fomc_dummies_cycle_dummies.R` generates FOMC week dummy variables for later estimation of the influence on FOMC meeting dates on excess stock returns.

3.4.2 Data Processing

The analysis commences with the importation and organization of two distinct datasets. The first dataset, identified as `fomc_data`, is loaded from the file `fomc_week_dummies_1994_nov2023.csv`. This dataset encompasses information related to FOMC week dummies spanning from November 1994 to November 2023. The data is sorted by date, and the sorted dataset is then saved as `d:fomc_data`, thereby replacing any pre-existing file.

Following this, the second dataset, labeled as `us_returns_data`, is imported from the file `us_returns_df_1994_oct2023.csv`. This dataset contains information regarding Fama-French factors for the U.S. market, covering the period from October 1994 to October 2023. Similar to the first dataset, it undergoes sorting by date, and the sorted dataset is saved as `d:us_returns_data`, replacing any existing file.

To consolidate the information, a merge operation is executed using the "date" variable as the key. This operation combines the `fomc_data` and `us_returns_data` datasets into a new dataset named `fed_put_datamerged_data`. The merged dataset is saved as `d:fed_put_datamerged_data`, effectively replacing any prior file.

Finally, a new variable named `date2` is generated by transforming the existing "date" variable into Stata date format. This conversion is carried out using the `date()` function with the "YMD" (year-month-day) format. The resulting dataset is now primed for further analysis, incorporating information from both the FOMC week dummies and U.S. market returns datasets.

3.4.3 Calculation of stock excess returns

Excess stock returns are calculated using the Fama-French 3-factor model developed by Kenneth R. French and Eugene Fama. Data for US market returns for this model and also for various other markets (e.g. European, Asia) get published regularly on Kenneth R. French's webpage. (Kenneth R.)

If m represents $1 +$ stock return and r denote $1 +$ bill return the 1-day excess return (ex1) is calculated by subtracting r from m and multiplying the result by 100 which can be expressed as $\text{ex1} = 100 \times (m - r)$.

The 5-day excess return (ex5) is computed over a rolling 5-day window, involving the product of five consecutive values of m and r. The formula is given by $\text{ex5} = 100 \times (m \times m_{t+1} \times m_{t+2} \times m_{t+3} \times m_{t+4} - r \times r_{t+1} \times r_{t+2} \times r_{t+3} \times r_{t+4})$.

Furthermore, t represents the observation number in the dataset. Overall the calculation for evaluating stock excess returns provide insight for their performance relative to the risk-free rate.

3.4.4 Replication Results

	(1) 2014-2016 sample	(2) 1994-2014 sample	(3) 1994-2016 sample
w_t0	0.174*	0.138***	0.143***
	(1.92)	(2.80)	(3.21)
w_t2t4t6	0.166**	0.0890**	0.0990***
	(2.55)	(2.38)	(2.95)
_cons	-0.0486	-0.0164	-0.0206
	(-1.14)	(-0.76)	(-1.05)
N	782	5224	6006

significant at 1%-level (***), 5% level (**), 10% level (*)

Table 3.1: caption for table 1

3.4.5 Stock returns over the FOMC cycle from 2016 onwards

Answer Q.: Does the stylized fact of stock excess returns are mainly achieved in FOMC even weeks (0, 2, 4, 6) from 2016 onwards still persist?

	(1)	(2)	(3)	(4)
	2016-2019	2019-2022	2016-2023	1994-2023
w_t0	-0.211**	-0.0952	-0.125	0.0800**
	(-2.29)	(-0.57)	(-1.40)	(2.01)
w_t2t4t6	-0.0487	0.0578	0.0256	0.0828***
	(-0.74)	(0.48)	(0.41)	(2.81)
_cons	0.0960**	0.0108	0.0434	-0.00622
	(2.48)	(0.12)	(0.94)	(-0.34)
N	762	779	1752	7772

significant at 1%-level (***), 5% level (**), 10% level (*)

Table 3.2: caption for table 2

4 Conclusion

tbd.

Bibliography

Cieslak, Anna, Adair Morse, and Annette Vissing-Jorgensen. "Stock Returns over the FOMC Cycle". _Eprint: https://onlinelibrary.wiley.com/doi/pdf/10.1111/jofi.12818, *The Journal of Finance* 74, no. 5 (2019): 2201–2248. https://doi.org/https://doi.org/10.1111/jofi.12818. https://onlinelibrary.wiley.com/doi/abs/10.1111/jofi.12818. (Cit. on pp. 1, 7).

Cieslak, Anna, and Annette Vissing-Jorgensen. "The Economics of the Fed Put". *The Review of Financial Studies* 34, no. 9 (Sept. 1, 2021): 4045–4089. ISSN: 0893-9454, visited on 11/06/2023. https://doi.org/10.1093/rfs/hhaa116. https://doi.org/10.1093/rfs/hhaa116. (Cit. on pp. 1, 4).

Kenneth R., French. "Kenneth R. French - Data Library". Visited on 11/05/2023. https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html#Research. (Cit. on p. 8).