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# A DOVE TO HAWK RANKING OF THE MARTIN TO YELLEN FEDERAL RESERVES

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## ABSTRACT

This note ranks the Federal Reserves based on the tenure of their Chairs from William McChesney Martin, Jr. to Janet L. Yellen, using data from 1958 through 2018. Inflation “doves” are willing to tolerate more inflation than inflation “hawks.” Comparing the Taylor (1993) rule and core inflation to the effective fed funds rates, it is found that the Yellen Fed is the most dovish Fed since 1958. Controlling for the Fed’s dual mandate of low unemployment and low inflation, the Yellen Fed kept Fed funds rates significantly lower than prior Feds. The Yellen Fed had 292 to 306 basis points lower Fed funds rates than its predecessors after controlling for economic conditions. **JEL Classification:** E52, E58

## INTRODUCTION

This paper ranks Federal Reserves by their aversion to inflation. The tenures of Federal Reserve Chairs which have shown the most commitment to fighting inflation through the Fed funds rate are rated with the highest numbers. The Feds which have done the least to fight inflation are ranked closer to 1. The Yellen Fed is found to be the most dovish in history by two measures and the second most dovish by a third measure. The Yellen Fed funds rate targets were outside of historic norms and outside the rates set under the tenure of the most successful Federal Reserve Chairs since 1958.

Dr. Yellen was often called a “dove” and the Yellen Fed is often described as “dovish”; however, the author knows of no attempts to quantify how dovish the Fed was compared to history. A dove in the context of monetary policy is someone who is willing to live with higher inflation. In contrast, “hawks” want less inflation. Because there is an inverse relationship between short-term rates and inflation, doves are said to favor lower interest rates, and hawks are said to favor higher interest rates.

In the next section, we discuss the push for more rules-based monetary policy in the U.S. Congress during Janet Yellen’s tenure as Fed Chair with an eye towards the growing literature on central banking. Then, we develop a dove to hawk ranking of the Federal Reserve Chairs studied based on the Taylor (1993) rule and real Fed funds rates. The Yellen Fed was found to be the most dovish. Next, we find that the Yellen Fed deviated significantly from the Taylor (1993) rule. On average, it set Fed funds rates 292 basis points lower than that rule recommended. The regression results that control for inflation and unemployment levels also find

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that the Yellen Fed set rates significantly lower than its predecessors. The regressions find that the Yellen Fed set Fed funds rates 306 basis points lower than other Feds studied. Finally, the paper concludes and offers some directions for future research.

## **RULES V. DISCRETION AND THE YELLEN FED**

The last Fed Chair studied came into office during an extraordinary period of very low interest rates which were without historic precedent in the United States. The Federal Reserve under Chairs Ben Bernanke and Janet Yellen pursued a zero, interest rate policy (ZIRP) for about seven years from 2009 to 2016. The Fed funds rate target, the rate of interest at which banks lend to each other, had been set at between 0 and 0.25% since Q4 2008 to Q3 2016. Over this period, the Fed increased its balance sheet from under \$1 trillion to \$4.5 trillion by buying the mortgage bonds of the government-sponsored entities, Fannie Mae and Freddie Mac, and U.S. Treasury debt. That balance sheet held steady at about \$4.5 trillion over the tenure of the last Federal Reserve Chair studied, Janet Yellen, who Chaired the Fed from February 3, 2014, to February 3, 2018.

Over that period, there were attempts in Congress to curtail the discretion of the Fed. The House of Representatives (but not the Senate) has passed a bill, the Federal Reserve Accountability and Transparency (FRAT) Act, which attempted, among other things, to disclose to congress the monetary policy formulas that they adopt for setting interest rates. Nikolsko-Rzhevskyy et al. (2014) explains that the bill would have required the Fed to disclose a monetary rule that they had adopted to Congress. Nikolsko-Rzhevskyy et al. (2017) looked at several rules that placed different weights on inflation and the output gap including Taylor (1993) and found that rules placing more emphasis on the output gap would be more consistent with recent Fed policy. Moreover, that study recommends that a time-varying real rate be replaced with the Taylor (1993)'s implied two percent real rate of interest. Murray et al. (2015) found that the Taylor rule was generally followed prior to 1973 and in the tenure of Alan Greenspan, but it could not characterize monetary policy under Paul Volker.

Many of the members of the Yellen Fed's Open Market Committee (FOMC), the interest rate-setting committee, opposed that bill. In Kearnes and Torres (2014), Fed Chair Janet Yellen said, "It would be a grave mistake for the Fed to commit to conduct monetary policy according to a mathematical rule. No central bank does that."

Dr. Yellen's confirmation vote of 56-26 was the closest nomination vote for a confirmed Fed Chair in history, according to Kearnes and Torres (2014). Her successor was perceived as less extreme in his monetary policy views and had a much less controversial Federal Reserve Chair vote. Jerome Powell was confirmed by a vote of 83-14 and was voted by a survey of economists at about the median in terms of dovishness of the sixteen current permanent and rotating members of the Fed's monetary policy committee in 2017 according to Lane (2018). Charl  ty et al. (2017) found that women on central bank boards were more significantly likely to be replaced with women than men. That was not the case with Yellen and Powell. Yellen was rated as the fourth most dovish and the most consistent in her inflation views of all sixteen potential monetary policy committee members rated according to Condon et al. (2017). Ironically, the man who replaced Dr. Yellen with Mr. Powell, President Donald Trump, told Reuters in August 2018, "I'm not thrilled with

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his raising of interest rates, no.” Retaining Yellen as Fed Chair, at least according to the surveyed economists, would have been more likely to result in the lower interest rates that President Trump desired according to Mason and Holland (2018).

Diouf and Pépin (2017) find female central bank Chairs around the world have generally focused more on price stability than their male counterparts. Masciandaro et al. (2015) find higher representation by women on central bank boards is associated with lower inflation and more hawkish monetary policy. These results coupled with the findings of the present study suggest that Janet Yellen may have been an outlier among female central bank Chairs and monetary policy decisionmakers more broadly.

One widely cited monetary rule is the “Taylor rule” of Taylor (1993). The author of Taylor (1993) testified in the Federal Reserve Accountability and Transparency (FRAT) Act hearings in the House Financial Services Committee in support of the legislation. There is a long debate over rules versus discretion in economic circles. Kidland and Prescott (1977) argued that without monetary rules a policy maker’s tendency to trade inflation for higher employment will only lead to higher inflation. (For their contribution, Finn Kidland and Edward Prescott won the 2004 Nobel Prize in economics.) Favaretto and Masciandaro (2016) look at how monetary policy biases of monetary policy committee members interact with exogenous shocks in a theoretical model. Nikolsko-Rzhevskyy et al. (2014) found that in years where the Fed seemed to follow a Taylor (1993) or modified Taylor rule over the last 60 years, economic performance was better in terms of inflation and unemployment.

Under the Bernanke Fed, the central bank exercised not only discretion over interest rate-setting, but also the type and quantity of asset purchase programs and in the cases of Bear Stearns, AIG, and Lehman Brothers which private firms would be rescued or allowed to fail. The Yellen Fed, unlike the Bernanke Fed, operated in a benign economic environment with solid growth, low inflation, and unemployment that was under 7 percent and generally declined to 4.1 percent in the last quarter of her tenure.

## **RANKING PAST FEDERAL RESERVES**

We will see that the Yellen Fed ranks as very dovish in terms of interest rate-setting, achieving low unemployment outcomes. The Yellen Fed ranks well in terms of presiding over a low, average, quarterly unemployment in Table 1, and a low, average, quarterly misery index score in Table 2. The “misery index” is inflation plus unemployment averaged over the quarters where each Chair presided over the Fed. All data is quarterly from the St. Louis Fed. In quarters where Fed Chairs shared a quarter, the data for the whole shared quarter went into both Fed Chairs’ averages. The core CPI-U, stripped of food and energy prices, starts in 1958. Thus, we are only evaluating the last eleven years of William McChesney Martin, Jr.’s, tenure.

Barro and Gordon (1983) emphasized that to have an effective monetary policy, the central banker must either be averse to inflation at the expense of employment or bound by rules. If Dr. Yellen’s speech on wage inequality recounted in Pathe (2014) or her distinguished career as a labor economist is any indication, the Fed Chair favored low unemployment over low inflation, the opposite of what Barro and Gordon (1983) recommend.

Setting the Fed funds rate has been the Fed’s primary tool for fighting inflation. In this section, we look at how vigorously past Federal Reserve Chairs have fought

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inflation. First, we will compare the Taylor (1993) rule Fed funds rate to the effective average Fed funds rate over each Chair's term of office. Then, we will compare average inflation to the average Fed funds rate for each Fed Chair's tenure. A simple average of those two scores is used to determine the Dove ranking for the seven Fed Chairs studied.

The Taylor (1993) rule says that the Fed should set the Fed funds rate,  $r$ , according to the following formula:

$$r = i + .5y + .5(i - 2) + 2$$

$r$  = Fed funds rate

$i$  = inflation

$y$  = output gap =  $(Y - Y^*)/Y^*$

$Y$  = actual GDP

$Y^*$  = potential GDP

The ranking is in Table 3.

Using the Taylor (1993) rule to rank the Feds since 1958, the Yellen Fed is the second most dovish Fed and more dovish than the most recent three Feds. Only the failed Federal Reserve Chaired by William Miller deviated more from the Taylor rule. Miller's policy led to double-digit inflation. The Taylor rule suggests that the central bank should set the Fed funds rate at inflation plus 2% when its output and inflation targets are hit. That is, the long-run Fed funds rate should be 4%, which is consistent with the Yellen and Bernanke Fed's long-term forecasts.

When we drop the unemployment mandate and only look at how much the Fed fought inflation with the effective Fed funds rate, as in Table 4, the Yellen Fed is the most dovish, followed by the Bernanke, Burns, and Miller Federal Open Market Committees (FOMCs).

The Volker Fed set real short-term rates typically 4.3% *above* core inflation. In contrast, the Yellen Fed set real short-term rates at 1.4% *below* core inflation. Besides the Yellen Fed, only the Bernanke Fed had short-term rates on average below inflation. Unlike the Yellen Fed, the Bernanke Fed faced a recession and a banking crisis. Even the failed Federal Reserves under Arthur Burns and William Miller gave investors real returns above 0.8 percent.

To rank the last seven Federal Reserves, a simple average of the Tables 3 and 4's right-hand column scores are taken. As in Table 4's ranking, the Yellen Fed is the most dovish of the seven Federal Reserves studied.

## **EMPIRICAL TESTS OF FED FUND RATES IN THE YELLEN FED**

To more rigorously test how the Yellen Fed deviated in its setting of effective Fed funds rates than the rest of the sample we conducted an independent samples t-test. The Yellen Fed is defined to as Q1 2014 though Q1 2018, seventeen quarters. The rest of the Feds are defined as setting the rates from Q1 1958 to Q4 2013. As mentioned earlier the Q1 1958 cut-off is determined by the availability of core

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CPI-U data for Taylor (1993). The Taylor Rule controls for the Fed's dual goals of high employment and low inflation with a formula that gives weights to the desire for growth with the bad of inflation. We can see from the t-test below the Yellen Fed set effective Fed funds rates significantly lower, 292 basis points lower than prior Feds in the sample after controlling for economic conditions with the Taylor Rule.

Another way of analyzing the inflation-fighting measures of the Yellen Fed after controlling for the Fed's dual mandate is to regress civilian unemployment, core inflation, and a dummy for the Yellen Fed's tenure. The Yellen Fed dummy equals one if Janet Yellen was the Fed Chair during any part of the quarter and zero otherwise. In Table 7 below, we see that the Yellen Fed set effective Fed funds rates significantly lower with 99 percent confidence. Indeed, after controlling for inflation and unemployment, the Yellen Fed set its benchmark interest rate 306 basis points lower than prior Feds.

## CONCLUSION

The Yellen Fed is found to be the most dovish in history based on its setting of short-term interest rates relative to inflation. This paper finds that after controlling for the Fed's dual mandate that the Yellen Fed set its benchmark Fed funds rate 292 and 306 basis points lower than its predecessors. This paper looks at the interest rate-setting policy of the Federal Reserve going back to the Chairmanship of William McChesney Martin, Jr. and ending with Janet Yellen's tenure as Chairwoman. The Yellen Fed lacked a recession or banking crisis that may have justified the negative real interest rate policy of the Bernanke Fed. For its four years, the Yellen Fed succeeded in having falling unemployment and low inflation with negative real interest rates.

This paper has focused on the United States Federal Reserve, but other studies may want to look at policy rates from a global perspective. It would be interesting to see further work indicating if the Yellen Fed was part of a global trend towards lower policy rates or if it was still an outlier among its contemporaries and later central banks. Further, we have not controlled for quantitative easing or banking condition in this study. Those factors are, no doubt, important for quantifying the tightness or looseness of central bank policy or placing policy rates in the context of macroeconomic conditions.

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**TABLE 1: UNEMPLOYMENT RANKING**

<b>Rank</b>	<b>Fed Chair</b>	<b>Tenure</b>	<b>Unemp.</b>
1	Paul A. Volcker	Aug. 6, 1979 - Aug. 11, 1987	7.7
2	Ben S. Bernanke	Feb. 1, 2006 - Jan. 31, 2014	7.3
3	Arthur F. Burns	Feb. 1, 1970 - Jan. 31, 1978	6.3
4	G. William Miller	Mar. 8, 1978 - Aug. 6, 1979	6.0
5	Alan Greenspan	Aug. 11, 1987 - Jan. 31, 2006	5.5
6	Janet L. Yellen	Feb. 3, 2014 - Feb. 3, 2018	5.1
7	William McChesney Martin, Jr.	Jan. 1, 1958 - Jan. 31, 1970	5.0

**TABLE 2: MISERY INDEX RANKING**

<b>Misery Rank</b>	<b>Fed Chair</b>	<b>Tenure</b>	<b>Misery Index</b>
1	Paul A. Volcker	Aug. 6, 1979 - Aug. 11, 1987	13.9
2	G. William Miller	Mar. 8, 1978 - Aug. 6, 1979	13.5
3	Arthur F. Burns	Feb. 1, 1970 - Jan. 31, 1978	11.9
4	Ben S. Bernanke	Feb. 1, 2006 - Jan. 31, 2014	9.1
5	Alan Greenspan	Aug. 11, 1987 - Jan. 31, 2006	8.4
6	Janet L. Yellen	Feb. 3, 2014 - Feb. 3, 2018	8.4
7	William McChesney Martin, Jr.	Jan. 1, 1958 - Jan. 31, 1970	7.4

**TABLE 3: TAYLOR RULE RANKING**

<b>Dove Rank</b>	<b>Fed Chair</b>	<b>Tenure</b>	<b>Taylor (1993) Fed funds - effective Fed funds</b>
1	G. William Miller	Mar. 8, 1978 - Aug. 6, 1979	3.8
2	Janet L. Yellen	Feb. 3, 2014 - Feb. 3, 2018	2.9
3	Arthur F. Burns	Feb. 1, 1970 - Jan. 31, 1978	2.5
4	William McChesney Martin, Jr.	Jan. 1, 1958 - Jan. 31, 1970	0.9
5	Ben S. Bernanke	Feb. 1, 2006 - Jan. 31, 2014	0.9
6	Alan Greenspan	Aug. 11, 1987 - Jan. 31, 2006	-0.3
7	Paul A. Volcker	Aug. 6, 1979 - Aug. 11, 1987	-1.6

**TABLE 4: NEGATIVE REAL FED FUNDS RATE RANKING**

<b>Dove Rank</b>	<b>Fed Chair</b>	<b>Tenure</b>	<b>Inflation - Effective Fed Funds</b>
1	Janet L. Yellen	Feb. 3, 2014 - Feb. 3, 2018	1.41
2	Ben S. Bernanke	Feb. 1, 2006 - Jan. 31, 2014	0.34
3	Arthur F. Burns	Feb. 1, 1970 - Jan. 31, 1978	-0.89
4	G. William Miller	Mar. 8, 1978 - Aug. 6, 1979	-1.43
5	William McChesney Martin, Jr.	Jan. 1, 1958 - Jan. 31, 1970	-1.59
6	Alan Greenspan	Aug. 11, 1987 - Jan. 31, 2006	-1.90
7	Paul A. Volcker	Aug. 6, 1979 - Aug. 11, 1987	-4.33

**TABLE 5: DOVE RANKING**

<b>Dove Rank</b>	<b>Fed Chair</b>	<b>Tenure</b>	<b>Dove Score</b>
1	Janet L. Yellen	Feb. 3, 2014 - Feb. 3, 2018	2.17
2	G. William Miller	Mar. 8, 1978 - Aug. 6, 1979	1.19
3	Arthur F. Burns	Feb. 1, 1970 - Jan. 31, 1978	0.79
4	Ben S. Bernanke	Feb. 1, 2006 - Jan. 31, 2014	0.60
5	William McChesney Martin, Jr.	Jan. 1, 1958 - Jan. 31, 1970	-0.34
6	Alan Greenspan	Aug. 11, 1987 - Jan. 31, 2006	-1.08
7	Paul A. Volcker	Aug. 6, 1979 - Aug. 11, 1987	-2.96

**TABLE 6: T-TEST OF MEANS OF DIFFERENCE BETWEEN TAYLOR (1993)'S EFFECTIVE FED FUNDS RATES VERSUS ACTUAL QUARTERLY EFFECTIVE FED FUNDS RATES FOR THE YELLEN FED AND PREVIOUS FEDERAL RESERVE BOARDS**

<b>sub-sample</b>	<b>number of quarters</b>	<b>mean</b>	<b>standard deviation</b>	<b>t-value</b>	<b>degrees of freedom</b>	<b>p-value</b>
Yellen Fed	17	0.47%	0.45%	-5.635***	240	0.000
Other Feds	225	5.32%	3.54%			

Notes: Significance is denoted with a confidence level of 99 percent by \*\*\*, 95 percent by \*\*, and 90 percent by \*.



**TABLE 7: OLS REGRESSION OF AVERAGE QUARTERLY EFFECTIVE  
FED FUND RATES FROM Q1 1958 TO Q1 2018**

<b>Coefficient Description</b>	<b>Coefficient</b>	<b>T-statistic</b>	<b>Significance</b>
Constant	3.295	6.135***	0.000
Core Inflation (core CPI-U)	3.295	21.575***	0.000
Unemployment Rate	-0.418	-4.919***	0.000
Yellen Fed Dummy	-3.061	-3.061***	0.000
<i>Quarterly observations</i>	<i>241</i>		
<i>Adjusted R-squared</i>	<i>0.698</i>		

Notes: Significance is denoted with a confidence level of 99 percent by \*\*\*, 95 percent by \*\*, and 90 percent by \*.

