Pioneer Floating Rate Trust
Form N-CSR
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SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM N-CSR

CERTIFIED SHAREHOLDER REPORT OF REGISTERED
MANAGEMENT INVESTMENT COMPANIES

Investment Company Act file number 811-21654

Pioneer Floating Rate Trust
(Exact name of registrant as specified in charter)

60 State Street, Boston, MA 02109
(Address of principal executive offices) (ZIP code)

Terrence J. Cullen, Pioneer Investment Management, Inc.,
60 State Street, Boston, MA 02109
(Name and address of agent for service)

Registrant's telephone number, including area code: (617) 742-7825

Date of fiscal year end: November 30

Date of reporting period: December 1, 2015 through May 31, 2016

Form N-CSR is to be used by management investment companies to file reports with the Commission not later than 10 days after the transmission to stockholders of any report that is required to be transmitted to stockholders under Rule 30e-1 under the Investment Company Act of 1940 (17 CFR 270.30e-1). The Commission may use the information provided on Form N-CSR in its regulatory, disclosure review, inspection, and policymaking roles.

A registrant is required to disclose the information specified by Form N-CSR, and the Commission will make this information public. A registrant is not required to respond to the collection of information contained in Form N-CSR unless the Form displays a currently valid Office of Management and Budget ("OMB") control number. Please direct comments concerning the accuracy of the information collection burden estimate and any suggestions for reducing the burden to Secretary, Securities and Exchange Commission, 450 Fifth Street, NW, Washington, DC 20549-0609. The OMB has reviewed this collection of information under the clearance requirements of 44 U.S.C. ss. 3507.

ITEM 1. REPORTS TO STOCKHOLDERS.

Pioneer Floating
Rate Trust

Semiannual Report | May 31, 2016

Ticker Symbol: PHD

[LOGO] PIONEER
Investments(R)

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Table of Contents

President's Letter

Dear Shareowner,

The first half of 2016 has featured some remarkable twists and turns in the global economy. The year began on shaky footing as surging market volatility brought about by fears of weaker global economic growth as well as falling oil prices depressed returns for investors. In the US, both equity and fixed-income markets declined significantly through the first six weeks of the year, only to recover the losses by the end of the first quarter when market sentiment shifted, due in part to accommodative monetary policies from the world's central banks.

Midway through the first quarter, for example, the US Federal Reserve System (the Fed) backed off plans to raise interest rates four times in 2016, and the European Central Bank announced a more comprehensive asset-purchasing program in the hopes of encouraging lending, and boosting both inflation and economic growth. The markets responded with a solid rally. By the end of May, in fact, US equities, as measured by the Standard & Poor's 500 Index, had generated a solid year-to-date (YTD) return of 3.55%, and the YTD return (as of 5/31/16) of the Barclays Aggregate Bond Index, a common measure of the US fixed-income market, was 3.45%.

As markets began to settle down, the Brexit vote - the vote confirming that the United Kingdom (UK) would exit the European Union (EU) - surprised many, and the rollercoaster ride began once again. The market sold off sharply in the first few days after the vote, then rallied as investors sought bargains created by the initial post-Brexit sell-off, and as more, less ominous information about the implications of the Brexit results came to light.

From a macroeconomic perspective, Pioneer believes the negative economic impact of Brexit on the US should be more limited compared with its effects on the UK and Europe. However, we expect reduced global demand due to a higher level of uncertainty and risk aversion among investors. While the spillover effects on the US economy are unclear, we think it possible that, in the event of a significant negative economic impact, the Fed might consider other monetary policy options. Globally, we believe that central banks are ready to act and that their initial focus will be to stabilize the markets and provide liquidity, if needed.

While the Brexit vote is now official, the expectation is that the actual process of separating the UK from the EU could take at least two years. Only in the next several months may we begin to see signs of what path Europe will follow as it adapts to the reality of an EU without one of its most prominent members. Over the medium-term, however, we believe uncertainties over the future of Europe and central banks' reactions will likely dominate financial markets, and we believe the news flow surrounding Brexit will continue to weigh on riskier assets. Competing for headlines, too, is the current financial condition of many European banks. Ultimately, we think that the political and monetary policy responses will be the major variables when it comes to managing an orderly

Brexit. In addition, as the second half of 2016 gets underway, we continue to see central bank policies as generally supportive of the US economy -- for which we maintain an expectation of modest growth this year.

Aside from the Brexit-caused uncertainties, economies around the world in both developed and emerging markets are experiencing deep structural changes. Current challenges include incomplete debt deleveraging in both emerging and developed markets, where debt levels continue to grow, the transition of many emerging markets economies from export/investment-driven models to more domestic demand-driven models, and aging populations, which are reducing productivity and limiting economic growth potential (primarily in the developed markets but also in emerging markets such as China). Geopolitical instability on many fronts, the rising risk of policy mistakes, and market liquidity issues combine to increase the possibility of sharp swings in asset values. Meanwhile, in the US, as always in a presidential election year, the political rhetoric of 2016 has the potential to impact domestic sectors such as health care.

Throughout Pioneer's history, we have believed in the importance of active management. During periods of market volatility, we view the value of active management as even more compelling. Our experienced and tenured investment teams focus on identifying value across global markets using proprietary research, careful risk management, and a long-term perspective. We believe our shareowners can benefit from the experience and tenure of our investment teams as well as the insights generated from our extensive research process.

As always, and particularly during times of market uncertainty, we encourage you to work with your financial advisor to develop an overall investment plan that addresses both your short- and long-term goals, and to implement such a plan in a disciplined manner.

We greatly appreciate the trust you have placed in us and look forward to continuing to serve you in the future.

Sincerely,

/s/ Lisa M. Jones

Lisa M. Jones
President and CEO
Pioneer Investment Management USA Inc.
May 31, 2016

Any information in this shareowner report regarding market or economic trends or the factors influencing the Fund's historical or future performance are statements of opinion as of the date of this report. Past performance is no guarantee of future results.

Portfolio Management Discussion | 5/31/16

Floating-rate bank loan investments rallied over the latter half of the six-month period ended May 31, 2016, which resulted in the asset class producing healthy, positive returns for the full six months. In the following interview, Jonathan Sharkey discusses the factors that affected the performance of Pioneer Floating Rate Trust during the six-month period. Mr. Sharkey, a senior vice president and a portfolio manager at Pioneer, is responsible for the day-to-day management of the Trust.

Q How did the Trust perform during the six-month period ended May 31, 2016?

A Pioneer Floating Rate Trust returned 3.60% at net asset value and 6.59% at market price during the six-month period ended May 31, 2016, while the Trust's benchmark, the Barclays US High Yield Loans Index (the Barclays Index), returned 3.81% at net asset value. Unlike the Trust, the Barclays Index does not use leverage. While the use of leverage increases investment opportunity, it also increases investment risk. During the same six-month period, the average return (at market price) of the 22 closed end funds in Lipper's Loan Participation Funds category (which may or may not be leveraged) was 7.60%.

The shares of the Trust were selling at a 9.41% discount to net asset value on May 31, 2016.

The Trust's standard, 30-day SEC yield was 5.37% at the end of the six-month period on May 31, 2016*.

Q How would you describe the investment environment for bank loans during the six-month period ended May 31, 2016?

A It was a difficult market for floating-rate bank loans - as well as for credit-sensitive investments in general - over the first half of the six-month period. The challenging environment that predominated for most of 2015 persisted, an environment in which credit-sensitive investments had fallen into disfavor amid growing investor worries about the health of the world economy. Several factors drove the downturn in the prices of credit-sensitive securities, including falling prices of oil and other basic commodities, evidence of slowing economic growth in China, and a resurgent debt crisis in Greece that raised concerns about the prospects for the wider European economy.

Given that backdrop, floating-rate loans, as measured by the Barclays Index, posted negative total returns over the first half of the six-month period (from December 2015 through February 2016). In March, however, loan

* The 30-day SEC yield is a standardized formula that is based on the hypothetical annualized earning power (investment income only) of the Trust's portfolio securities during the period indicated.

prices bounced back sharply as oil prices stabilized and began to rise, with the recovery continuing over the following two months. News that the Chinese government's fiscal policies were becoming more accommodative in the hopes of spurring economic growth also buoyed the loan market, as did the more dovish stance adopted by the US Federal Reserve System (the Fed) - at least for the short term - with regard to further tightening of domestic monetary policy. The Fed began its tightening cycle by raising the Federal funds rate by 0.25% in December of 2015, but then indicated a more cautious approach as the global economy and the capital markets got off to a rocky start in early 2016.

After losing ground in the first half of the period, the Trust's benchmark, the Barclays Index, generated a 6.12% return over the final three months, and finished the six months with a return of 3.81%.

Q Which of your investment decisions had the biggest effects on the Trust's benchmark-relative performance during the six-month period ended May 31, 2016?

A Consistent with our traditional approach of favoring a somewhat higher-quality portfolio in comparison with the makeup of the Barclays Index, the Trust's return at net asset value outperformed the benchmark during the market decline from December through February, but slightly lagged the benchmark's return during the rally in the second half of the period. Over the first five months of 2016, single B-rated loans in the Barclays Index have returned almost 1.25% more than those rated BB, while credits rated CCC have returned roughly 6.25% more than BBs. These figures underscore how lower-quality "risk-on" assets have outperformed the rest of the loan market of late, a factor that detracted from the Trust's benchmark-relative performance in the second half of the six-month period.

The biggest positive contributors to the Trust's absolute performance during the period were holdings in consumer cyclicals and consumer non-cyclicals. On the other hand, holdings in the insurance and energy sectors detracted from the Trust's returns. Energy loans benefited from increases in oil prices only toward the end of the period, thus limiting the positive offset to energy's poor performance earlier in the period.

In comparison with the Barclays Index, the Trust's modest overweights to the industrials and basic industries sectors, and a moderate overweight to capital goods made the largest positive contributions to benchmark-relative performanc