

Fig. 1. Adam minimizes the model objective most effectively. SGD with various learning rates either diverge (as in the case of $\eta = 10^{-4}$) or do not efficiently reach the value that Adam does. The best model achieves a total squared mispricing error of 2.525×10^3 .

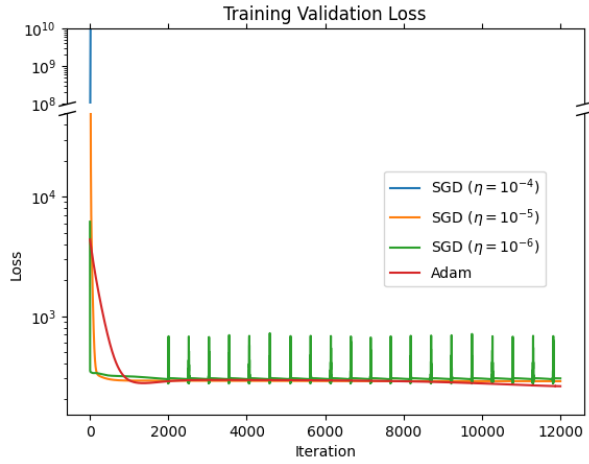


Fig. 2. Adam shows the best results on the validation set as well. SGD with $\eta = 10^{-4}$ still diverges. Interestingly, SGD with $\eta = 10^{-6}$ has an oscillating loss with periodic spikes.

and Net Cash Flows from Operating Activities having near negligible loadings.

TABLE I
FACTOR LOADINGS

Variable	Factor Loading
st_rev	-1.87×10^{-2}
oancfy	-3.20×10^{-4}
xoprq	-6.51×10^{-2}
FEDFUNDS	-2.04×10^{-3}
PERMITS	5.15×10^{-5}
UEMPLT5	2.67×10^{-3}

Using the learned parameters \mathbf{b} from our model, we backtest a portfolio with weights given by ω_t out-of-sample. Early in the test period, the portfolio invests significantly, though

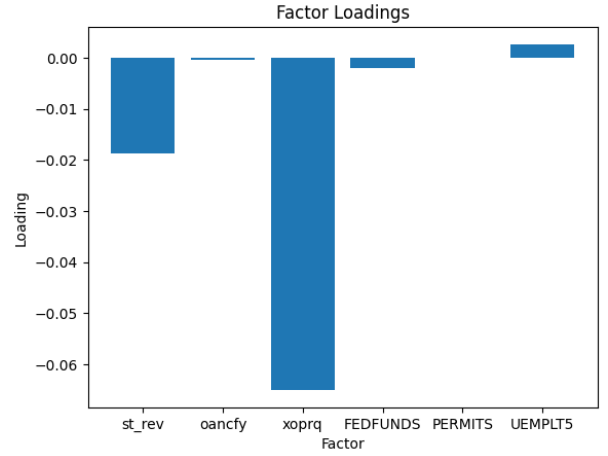


Fig. 3. Extraordinary Items and Discontinued Operations and Standardized Revenue have significant loadings. New House Building Permits and Net Cash Flows from Operating Activities have near negligible loadings.

not fully. Later in the test period, the portfolio has nearly full short exposure. Contrary to what the factor loadings might suggest, this trend is likely due to changes in the Federal Funds Rate and New House Building Permits Issued. Although these variables' loadings are small, the change in their normalized values are reciprocally large in magnitude. These trends likely drove the change in investment over time. Figure 8 in the Appendix shows the full portfolio investment over the validation period, and Figure 9 in the Appendix shows the average trends in each factor over the same period. Together, these figures illustrate the coinciding similarities between these trends.

The portfolio returns outperform a risk-free investment over the validation period and achieve a Sharpe Ratio of 0.33 (Figure 4). We also test a portfolio hedged against sector exposure by shorting an index of our universe (Figure 5). This portfolio performs similarly on total period return basis, though it has significantly more drawdown and a lower Sharpe Ratio of 0.22.

In Figure 6, we compare our portfolio to our universe index portfolios (equal weighted and market value weighted) and the risk-free portfolio. Except in the beginning of our test period, our portfolio shows a significant inverse relationship with the sector indices. As a result, it is very successful at capturing the significant losses affecting the whole sector in the final portion of the test period. This performance aligns with the trends from Figure 8. The portfolio's shift from long to short coincides with the reversal of the index trend.

Interestingly, the strategy underperforms the index during most of the remaining test period. Both indices underperform our portfolio on a risk-adjusted basis, with the market value index and equal weighted index both having Sharpe Ratios of -0.074 .

We also test the effect of factor loading regularization on our portfolio. Figure 10 shows the Sharpe Ratios generated by portfolios based on parameters fit with different regularization