**Portfolio Objective**

The investment seeks long-term capital appreciation. Normally, the fund places at least 80% of its net assets in the stock of smaller companies. It mainly invests in a diversified portfolio of domestic small-cap growth companies with strong growth prospects, including common stocks and other equity investments. A corporation is deemed to be a small cap company for the purposes of the fund if, at the time of the fund's investment, its market capitalization is less than that of the largest capitalized company listed by the Russell 2000 Index.

The Small Cap Growth Fund looks to invest in high-quality small cap companies with projected strong earnings growth.

**Investment Strategy**

Invests in credible companies with anticipated earnings growth

As part of the investment process, significant, in-depth fundamental research is conducted on an organization, its rivals, suppliers, and customers.

invests in businesses that satisfy some or all of the requirements listed below: market leadership, distinctive goods or processes, strong marketing capabilities, value to customers, and rapid industry growth.

**Why this fund?**

Seeks to provide strong, long-term investment results

utilizes a distinct way of thinking when it comes to growth investing because of the team's contrarian bias, sensitivity to value, and experience with emerging and microcap companies**.**

**Security Holdings**

**2.1 Top 10 holdings:**

Ongaki (2021) examined the relationship between 1-year, 3-year and 5-year annual returns and the percentage of top-10 holdings of funds, he concluded that funds’ annual performance is statistically significantly impacted by the top-10 percentage asset holdings. Therefore, study the top 10 holdings of WBSIX is a necessary step for our analysis in later sections.

As of 30th September 2022, the William Blair Small Cap Growth Fund I (WBSIX) has totally 91 holdings. Its top 10 holdings and weight are list in table 1:

|  |  |  |
| --- | --- | --- |
| # | Company Name | % of Fund |
| 1 | BWX Technologies, Inc. | 2.5% |
| 2 | National Vision Holdings, Inc. | 2.4% |
| 3 | Verra Mobility Corporation | 2.3% |
| 4 | Casella Waste Systems, Inc. | 2.2% |
| 5 | TechnipFMC plc | 2.2% |
| 6 | Merit Medical Systems, Inc. | 2.1% |
| 7 | The Brink's Company | 1.9% |
| 8 | Cameco Corporation | 1.9% |
| 9 | WNS (Holdings) Limited | 1.8% |
| 10 | Albany International Corp. | 1.7% |
| **Total** | **Total Top 10** | **21.0%** |

Table 1: Top 10 holdings of WBSIX (William Blair, 2022)

Table 1 shows that the top 10 holdings account for 21% of the fund.

**2.2 Total Fund Assets**

As of 30th September 2022, the total net assets value of WBSIX is $498 million.

**2.3 Number of Assets**

WBSIX has a total number of 91 holdings, and extends across health care, industries, information technology, consumer discretionary, energy section, etc., which account for 23.7%, 21.5%, 19.1%, 11.6%, 9.2% of the total asset respectively.

**Portfolio Expectations**

**The Small cap growth fund Class I managed by William Blair Ltd. established on 27th December 1999. The fund management focuses on long term investments in small cap growth companies which are expected to generate a constant growth earnings.** **William Blair's Research Agenda ensures that portfolio managers and analysts focus on the most appealing portfolio assets at all times. Given the team's contrarian bias, valuation sensitivity, and experience with undiscovered and microcap companies, growth investing requires a unique thought process. Majority of the fund’s assets are in small cap domestic equity securities, with the primary risk being that the value of the equity securities it holds will decline.**

**Expected Return- CAPM Model**

**For the CAPM model, we assume a beta of 0.892 as reported by the William Blair Funds reports for the 10y beta. Also, the figure for the risk free rate is assumed as the current 3-month U.S. Treasury Bond yield since over 70% of the fund’s securities are in the U.S. Also because of the fund’s U.S. presence, we assume the expected market return for calculation od the risk premium to be 10.75% - which is the 10-year average annualized return of the Russell 2000 Growth Index (as reported by Morningstar). The expected return comes out as 9.66%.**

**Expected return E(R) = Riske free rate + Risk premium**

**Risk Premium = Beta (Expected Market Return – Risk Free Rate)**

**Risk Free Rate = 0.7%**

**Beta= 0.892**

**Expected Market Return = 10.75%**

**E(R)= 0.007+0.892(0.1075-0.007)**

**E(R)= 0.0966=9.66% estimated return**

**Risk Management**

**4.1 Types of Risks**

**There are varies risks in the WBSIX portfolio, as shown in Exhibit 1, this fund is invested across many fields including medical, industries, information technology, consumer discretionary, etc. One of the main risks faced by WBSIX, therefore, is the geopolitical risk. Any activities associated with war, terrorism, economic uncertainty, and related geopolitical events will have a significant impact on the U. S. economics and markets, which in turn, will create big volatilities for WBSIX. Other type of risks faced by WBSIX include:   
Market risk.**

**Style risk: Different investment style may cause up and downs for the growth of WBSIX.**

**Smaller company risk: WBSIX has 91 holdings, some of them are smaller companies. Stock of smaller companies has bigger risks than bigger companies.**

**Liquidity risk: WBSIX face liquidity since it is traded less frequent relatively.  
Focus risk: Top 10 holdings account for 21% percent of WBSIX’s assets, so it face a risk of concentrating too much on a few industries. For example, if there is a big turbulence in the health market, the return of WBSIX will be greatly affected.**

**4.2 Standard Deviation**

**We collected the data associated with WBSIX from the Nasdaq website (2022). The dataset ranges from 29th October, 2012 to 31st October, 2022, so we have a total of 10 years of historical WBSIX data. These data included the open, close, high, low, adjusted close values on each trading days. We used the adjusted close value to calculate its weekly returns and then use formula to calculate the annual return:**

**After obtained the 10 annual return records, we used the following formula to calculate the**

**3-year, 5-year and 10-year of standard deviation**

|  |  |
| --- | --- |
| ****Time Period**** | ****SD**** |
| ****3 years (10/29/2019-10/28/2022)**** | 40.649% |
| ****5 years (10/30/2017-10/28/2022)**** | 29.228% |
| ****10 years (10/29/2012-10/28/2022)**** | 25.786% |

**Table 2: Standard Deviation of WBSIX**

**Table 2 shows the standard deviation of WBSIX annual return for different time duration. The reported 10-year standard deviation on the William Blair website is less than 20%, which is much less than our 10-year standard deviation value of 25.786%. We know that higher standard deviation is associated with high risk of the fund, so one possible reason for the difference between the reported 10-year standard deviation and our 10-year standard deviation could be that, William Blair & Company tried to make its standard deviation looks smaller to attract more investors for the fund.**

**4.3 Value at Risk**

**Value at risk (VaR) measure the risk of loss for an investment. It is determined by the three variables: time period, confidence interval, and size of possible loss. There are multiple methods to calculate VaR, in our case, we use historical method:**

**Where vi is the number of variables on day i and m is the number of days from which historical data is taken.**

**Based on the historical weekly return, from the calculation (in given Excel)we know that for WBSIX, there is a 95% chance that its weekly return will be above -4.89% and there is 99% chance that its weekly return will be above -13.94%.**

**4.4 Portfolio Beta**

**In our case, Beta is an indicator of the volatility of WBSIX comparing to the whole market. If the beta of WBSIX is larger than 1, then the WBSIX is more volatile than the overall market.**

**There is no reported portfolio beta on the William Blair website, neither the full information of the whole 91 holdings could be found, so we will be using the formula to calculate the Beta of WBSIX:**

**r is the correlation between WBSIX and the benchmark.**

**On the William Blair Website, they reported the SD of an index fund to be 19.44%, however, we do not have the correlation value of this index and the WBSIX, so we adopted the S&P 500 Index Fund Class S (SPFIX) from the same data source (**Nasdaq, 2022) **to represent the overall market and calculated the correlation between SPFIX and WBSIX: 0.640455086**

**The reported 10-year standard deviation of SPFIX is 0.14 (Yahoo Finance, 2022). Hence, the beta of WBSIX portfolio is:**

**The beta of WBSIX is 1.179625, this is a bit bigger than 1, indicating that WBSIX is more volatile than the overall market.**

**4.5 Sharpe Ratio**

**Sharpe ratio is also called adjusted risk, a mutual fund with higher Sharpe ratio is considered to be better than a fund with lower Sharpe ratio (Sharpe, 1998). To calculate the Sharpe ratio for our WBSIX, we use the following formula:**

**The standardized return of WBSIX on the William Blair’s website (2022) is:**

|  |  |
| --- | --- |
| ****Duration**** | ****Return**** |
| ****3-year**** | **6.38%** |
| ****5-year**** | **7.48%** |
| ****10-year**** | **12.11%** |

**Table 3: The standardized return of WBSIX**

**We will use these returns as the expected return of WBSIX to calculate its Sharpe Ratio. The risk-free return is the return of an investment with zero risks. In the United States, we can use the yield of treasury as the risk-free rate, as of today (28th Oct, 2022), the treasury rate reported by FRED is:**

|  |  |
| --- | --- |
| ****Duration**** | ****Treasury rate**** |
| ****3-year**** | **4.41%** |
| ****5-year**** | **4.20%** |
| ****10-year**** | **4.04%** |

**Table 4: The treasury rate**

**Combining the treasury rate, expected return of WBSIX, and standard deviation of WBSIX, we get the WBSIX’s Sharpe ratio for different duration:**

|  |  |
| --- | --- |
| ****Duration**** | ****Treasury rate**** |
| ****3-year**** | 4.846% |
| ****5-year**** | 11.222% |
| ****10-year**** | 31.296% |

**Table 5: The Sharpe ratio**

**4.6 Jensen Alpha**

**Jensen Alpha is also a risk-adjusted indicator of the performance of portfolios. It determines portfolio’s expected excess return over its theoretical expected return (**Jensen, 1968).

**It is calculated by the formula:**

**Here is the portfolio return, is risk free rate and is expected market return.**

**Again, we use the SPFIX to represent the total market, its 10-year return is 14.99%, so Our Beta = , for 10-year duration is 21.962%,**

**Here we get a negative Jensen Alpha, which indicates that WBSIX has not yet earned its expected return.**

**4.7 Treynor Index**

**Again, Treynor Index is also a portfolio performance indictor, it is calculated by:**

**In our case, the Treynor index is . This ratio indicates that for every 1-unit risk taken by WBSIX, its excess return will be increased by 6.8412%.**

**5. Fund Characteristics:**

**The fund has long term investment strategies and is designed for investors aiming long term investment tenure. During the third quarter, the William Blair Small Cap Growth Fund (Class N shares) outperformed its benchmark, the Russell 2000 Growth index. In the third quarter, the Small Cap Growth portfolio outperformed the Russell 2000 Growth Index marginally. Stock-specific dynamics drove relative performance the most. Penumbra (Health Care), Stem (Industrials), and National Vision were among our top individual contributors (Consumer Discretionary). Penumbra creates, develops, manufactures, and sells novel products and aspiration systems for the treatment of stroke and other peripheral vascular conditions. William Blair has**

**Actual Returns**

**1-Year, 3-Year, 5-Year Returns  
WBSIX class I shares has return estimated 1 year average return equaling** -25.14% and 5 year average return estimating around 9.48% which tends to increase as the investment horizon increases to 9.43% and as the fund has long term investment objectives it churns around 13.28% average return for a 10 year period which compared to its benchmark performs better in all the years estimated. As RUO has an average 1 year estimated return around -26.02%, 3 years estimates at 5.11% and lower change in %return in 5 year duration at 5.17% and finally the 10 year average index return around 10.15%.

Conclusion:  
  
The estimates by the fund are appropriate and the fund manages the asstes in their own way and has continued to do so for the past years and managed to perfom better than the index and its peers.

**Exhibit 1:**

**The WBSIX Investment sectors summary (**William Blair, 2022)

**Table

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**Exhibit 2:**

**WBSIX Fund Factsheet and Statistics.  
Table

Description automatically generated**

**Exhibit 3:  
WBSIX Morning Star Ratings.**Table

Description automatically generated

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