Wine and music: diversification with investments of passion

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Abstract

Investors buy "investments of passion" – like classic cars, stamp collections, and art – for personal interest ahead of any financial benefits. This research aims to study the convergence of the two by examining fine wine and music as alternative asset classes. Analysis of each asset includes a history of price performance over the sample period, the asset's correlation with equity markets, the allocation between the asset and the S&P 500 according to an efficient portfolio frontier, and a maximum Sharpe ratio analysis. While acknowledging caveats such as the storage cost of wine, a short sample period, and market illiquidity, this study shows alternative assets such as wine and music can improve investors' portfolios and provide financial benefits beyond personal passion.

Keywords: Wine investment, Music investment, Alternative assets

1. Introduction

Creating a sophisticated asset class out of a hobby is not a new trend. Many high net-worth individuals buy and trade classic cars, stamps, and art. These "investments of passion" provide personal enjoyment along with financial benefits (Dimson *et al.*, 2018). The financial benefits to many of these hobbies-turned-investments have been well studied, and they often revolve around portfolio diversification (Fogarty, 2010; Dimson *et al.*, 2018; Veld and Veld, 2007; Briere *et al.*, 2015). Similar to the more traditional alternative investment classes like real estate and private equity, investments of passion are not highly correlated with the overall market. Modern portfolio theory suggests the inclusion of these non-

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correlated assets in a diversified portfolio can reduce nonsystematic risk and improve portfolio performance (Markowitz, 1952).

This study will focus on two asset classes: wine and music. Wine has existed as an investment opportunity for centuries. The advent of cork stoppers and preservatives in the 18th century made long-term storage possible. Shortly after, traders began paying premiums for older vintages, highlighting the possibility for capital appreciation. By the 19th century, fine wine speculation had spread widely in the UK (Phillips, 2018). Today, wine collection has become a popular hobby and investment activity. In 2012, 28% of high net-worth individuals reported having a wine collection (Barclays, 2012).

Investment in music traditionally involves musical instruments. With the ever-increasing size of the music industry worldwide, new securities have been created to enable investors to profit from its growth. Bowie Bond, which represent claims on the music royalties of singer David Bowie, was introduced in 1997. Due to its success, similar bonds for other artists have been originated. In 2018, Hipgnosis Songs Fund, also backed by music royalties, went public with an IPO. This publicly-traded stock allows even retail investors to add music investments in their portfolios.

Research on the diversification impact of wine, and especially, music investments is sparse. This paper fills this gap by using the Liv-ex Fine Wine 100 Index ("LIVX") and the Hipgnosis Songs Fund ("SONG") to analyze the benefits of investing in wine and music intellectual property, respectively, as parts of a diversified portfolio. The authors find that returns on wine and music have a low correlation with the S&P 500 and adding wine and music investment to a diversified portfolio of equity can reduce the portfolio's risk without decreasing its returns. The findings are consistent with prior results in the literature using earlier data.

The paper has several intended contributions. The authors are the first, to the best knowledge, to analyze Hipgnosis Songs Fund and its diversification benefits when combining it with a diversified equity portfolio. The research also extends existing results in the literature by using data that are more recently available and confirm earlier findings in the literature on investments in wine and music. Finally, the paper contributes to the literature on alternative investment, an asset class that has been gaining attention from both researchers and practitioners over time.

2. Literature review

In early 1997, Fahnestock & Co. banker David Pullman issued the Bowie Bond. This new financing vehicle was similar to a traditional corporate bond, which represents claims on a firm's future cash flows, except it represented claims on the music royalties of superstar rock singer David Bowie. Through the process known as securitization, Bowie was able to exchange the rights to his future income for a $55 million check today. Prudential Insurance Company bought up the bonds as a

chance to obtain investment-grade securities, Bowie found income in the face of an expiring recording and distribution deal, and David Pullman continued to issue similar bonds for other popular artists like James Brown and Ashford & Simpson (Chu, 1998).

In July 2018, Hipgnosis Songs Fund (LSE: SONGS) completed an IPO on the London Stock Exchange. Like the Bowie Bonds and subsequent Pullman Bonds, these securities were backed by music royalties. Unlike the Bowie Bonds, which were a private placement of debt, Hipgnosis Songs Fund is a publicly traded stock. This difference means unsophisticated investors can participate in the returns from music. For researchers, this means music can be analyzed as an asset class.

Traditional asset pricing focuses on financial assets such as stocks and bonds. However, with the emergence of new data sources, new asset classes have been analyzed (Jordà *et al*., 2019). Dimson and Spaenjers (2014) examine three "emotional assets" – stamps, art, and musical instruments – and find that they produced superior returns to the market but with significant price volatility. In an earlier study, they find that investing in collectible stamps may act as a hedge against unexpected inflation (Dimson and Spaenjers, 2011). Mandel (2009) uses a consumption-based pricing model on fine art as an investment to incorporate the value owners receive by merely possessing art. Single malt Scotch whisky, another consumption good, was studied to find the main determinants of asking prices by investors (Moroz and Pecchioli, 2019). Graddy and Margolis (2011) find a 3.5% return on investment in violins by using auction price data from 1850 to 2008.

Research on music as an investment class is scant. Chu (1998) studies Bowie Bonds from a legal and intellectual property perspective. Other academic references to Bowie Bonds are in a purely exemplary manner, not analytical. Maymin (2012) finds a correlation between the variance in beats per minute in popular songs and stock market performance, indicating a potential link between the listening habits of decision makers and economic conditions. Round Hill Music Royalty Partners is a private equity firm specializing in "revenue generating music copyright assets" (Round Hill Music, 2020). Unsurprisingly, there is little publicly available data and no research on the music-private equity business.

Past analyses of the financial merits of wine investment have been mixed. Fogarty (2010) provides a detailed literature review on the history of wine scholarship. The first study he cites showed no significant premium above the risk-free rate for California wines sold between 1973 and 1977 (Krasker, 1979). Jaeger (1981) shows positive excess returns to wine, especially with lower-quality vintages, suggesting that the risk of holding lower-quality wines is compensated by a higher return. Burton and Jacobsen (2001) show that the risk-return profile of wine was dominated by an equity portfolio. In his own analysis, Fogarty (2010) explains that the diversification properties of Australian wine can be an

improvement to an already diversified portfolio. More recently, wine has been found to outperform similar assets like art, stamps, and also bonds (Dimson *et al.*, 2015). Funds dedicated to wine investment can outperform general indices, with higher risk, as can individual investors (Lucey and Devine, 2015). The authors expand on these findings by using a new dataset of wine prices to extend the discussion on return, risk, and diversification potential in a portfolio.

3. Methodology

Any analysis of investments in the modern portfolio theory framework is based on two key measurements: return and risk. Previous studies of wine diversification have focused on estimating returns based on a sample of auction prices. For example, Fogarty (2010) examines returns to Australian wine via the repeat sales method on observed auction prices. This method is commonly used on assets that are infrequently traded, like real estate, but is more complex than measurements of return on standard financial assets.

Returns to wine are estimated by observing monthly changes in the Liv-ex Fine Wine 100 Index from 2001 to 2019. This index is maintained by Liv-ex, an online wine trading and pricing service created in 2000. The index "represents the price movement of 100 of the most sought-after fine wines on the secondary market," over half of which are from the Bordeaux region. Liv-ex estimates price levels by taking the mid-point between the highest bid and the lowest ask on the market and validates this against transaction prices (Liv-ex, 2020). Because the market prices are updated frequently, returns to wine on this index are estimated by taking the simple percentage change in prices, rather than using the repeat sales method.

As a publicly-traded company, returns for the Hipgnosis Songs Fund are straightforward to estimate. Because the company completed its IPO recently, in July 2018, daily prices are observed in order to maximize the number of data points. Return is calculated as the annualized arithmetic average percentage change in daily price.

Variance, or standard deviation, stands in as a proxy for risk and can be calculated on the price data for both the Liv-ex index and the Hipgnosis Songs Fund. When mixing both into a diversified portfolio, the risk calculation becomes somewhat more complex. Variance in a portfolio of two risky assets, A and B, where σ is the standard deviation, w is the weight allocated to asset A, and ρ is covariance, is given by Equation (1).

$$\sigma_P^2 = w^2 \sigma_A^2 + 2w(1-w)\sigma_A \cdot \sigma_B \cdot \rho_{AB} + (1-w)^2 \sigma_B^2 \qquad (1)$$

This equation demonstrates how low correlation between two assets leads to a lower portfolio variance. Thus, diversification reduces portfolio risk.

Combining the return and risk metrics gives the Sharpe ratio, a measure of risk-adjusted return. The Sharpe ratio of a portfolio, where R_P is the return on the portfolio, R_f is the risk-free rate, and σ_P is the standard deviation of the portfolio, is given by Equation (2).

$$S_P = \frac{R_P - R_f}{\sigma_P} \tag{2}$$

The risk-free rate is estimated by annualizing the returns to the one-month Treasury bills obtained from the Fama-French data library.[2]

The authors use the S&P 500 to represent a diversified portfolio in the analyses. The S&P 500 is a stock market index that tracks the performance of the 500 largest companies listed on U.S. stock exchanges. Companies in the index are weighted by market capitalization, and index composition is reevaluated quarterly. This index is widely used as a proxy for the overall equity market in research and in professional investing.

4. Results

4.1 Liv-ex 100 index analysis

Between July 2001 and December 2019, the Liv-ex 100 Index grew at an arithmetic average of 0.57% monthly, which gives an effective annual rate of 7.1%. The annualized standard deviation was 12.9%. This is a surprising result given the S&P 500 annualized return and standard deviation over the same period of 6.5% and 14.2%, respectively. Figure 1 illustrates the growth of a dollar invested in the wine index versus the S&P 500 over the sample period.
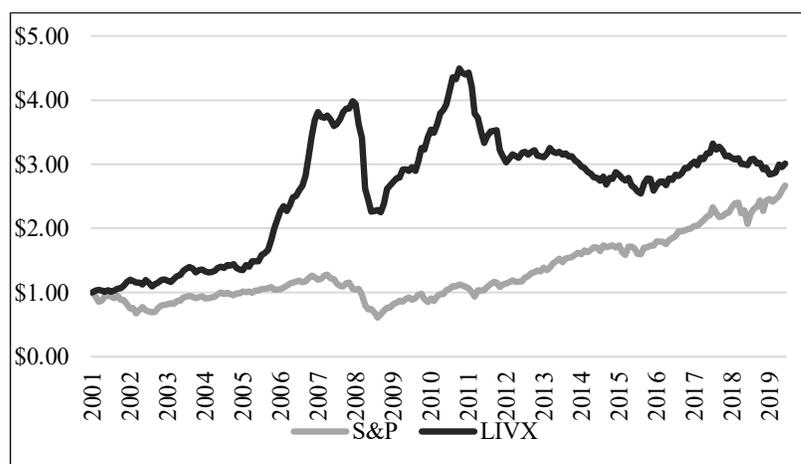

Figure 1. Growth of $1, LIVX

Source: Authors' calculation

Two data points are worth mentioning. Between 2006 and 2008, wine prices rode the bull housing market and subsequently corrected as the housing bubble

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[2] Available at: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

burst (JF Tobias, 2020). The data during the period of 2009-2011 show a similar pattern. Prices nearly doubled after the Chinese stimulus program spurred a new bull market and popularized wine gift-giving in the region, especially Bordeaux wine. Chinese government crackdowns on corrupt gift-giving eventually popped the "Bordeaux Bubble" (Doward, 2011).

Barring correlation with these two major market events, wine price exposure to movements in U.S. equities is rather low. Figure 2 shows a linear regression between the S&P 500 and LIVX monthly returns, giving a CAPM beta of 0.295 with an R^2 value of 0.107.
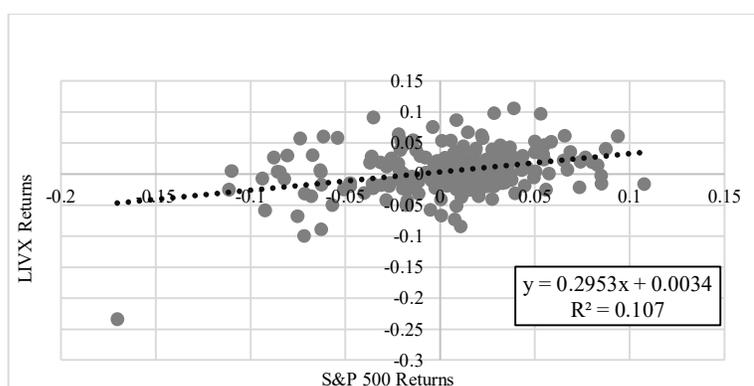
Figure 2. LIVX vs S&P (7/2001 - 12/2019)

Source: Authors' compilation

Figure 3 demonstrates a slightly higher exposure to the market between the end of 2005 and mid-2012, which was the period of the housing crisis and subsequent Chinese market bubble, with a beta of 0.47 and an R^2 of 0.2049.
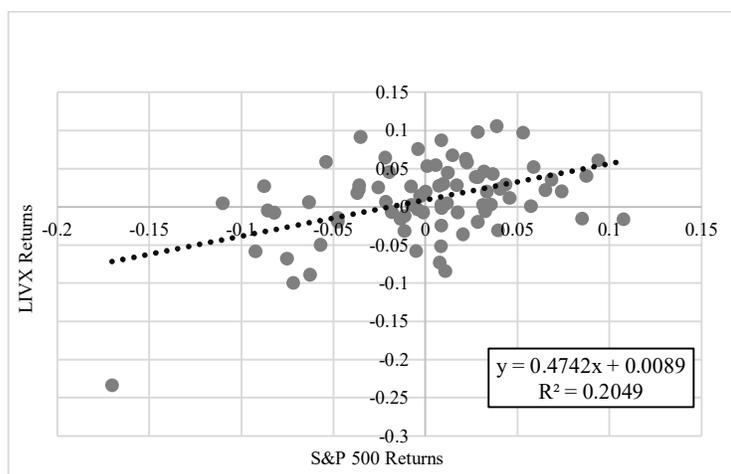

Figure 3. LIVX vs S&P (12/2005 - 6/2012)
Source: Authors' compilation

Such low betas seem to be counterintuitive to the picture Figure 1 presents, with large swings in returns of wine above the S&P. However, low R^2 values in the CAPM regression indicate, though returns might demonstrate higher volatility (at least in market crises), U.S. equity returns have low explanatory power to wine returns.

The low R^2 value between the market and wine points towards portfolio diversification potential. A covariance analysis gives a positive covariance and a correlation coefficient of 0.33. Because the correlation coefficient is less than one, the inclusion of wine in a portfolio can provide diversification benefits. Figure 4 is an efficient portfolio frontier showing possible combinations of the two risky assets, the S&P and wine.
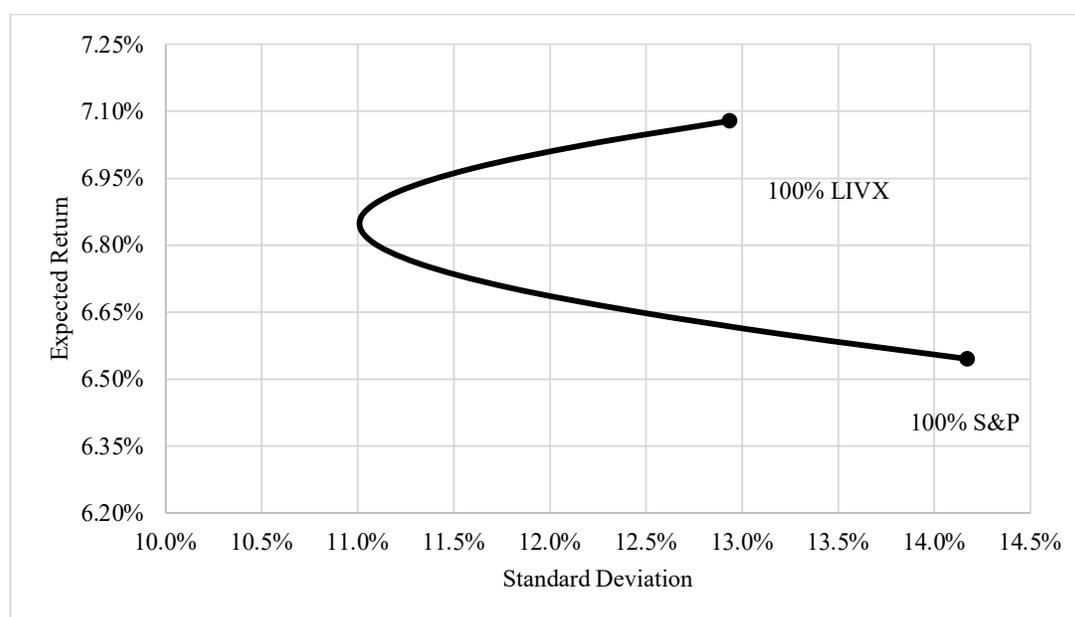

Figure 4. Efficient Portfolio Frontier, LIVX

Source: Authors' compilation

Note the inversion from a typical efficient portfolio frontier. The diversified risky asset, the S&P 500, is on the bottom right with the LIVX above it. This means fine wine dominates the S&P 500 on a risk-adjusted basis if an investor had to pick one or the other. This is due to the subnormal performance of the S&P 500 over the sample period at 6.5%. The long-term average return of the S&P 500 is 9.8%. If 9.8% were used as the S&P 500 return, the frontier would invert and produce a more typical looking graph. Possible combinations between the two yield diversification benefits. Figure 5 demonstrates the incremental effect of adding LIVX into a diversified portfolio. As the weight allocated to LIVX increases by a

small amount, the graph charts portfolio return above the risk-free rate, standard deviation, and the change in the Sharpe ratio compared to a 100% allocation to the S&P 500.
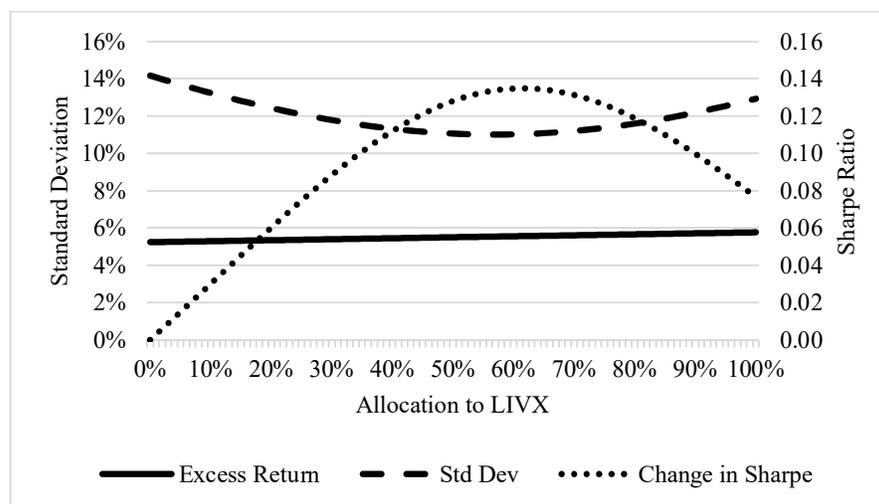

Figure 5. Diversification gains, LIVX

Source: Authors' compilation

The Sharpe ratio, which is defined in Equation (2), gives the risk-adjusted return for the portfolio and is maximized at 0.50 with a 62% allocation to LIVX and 38% to the S&P 500. Compare this to the S&P 500 Sharpe ratio of 0.37. Because the historical return on wine is slightly above the return on the S&P, the expected portfolio return steadily increases as the allocation to LIVX increases. If the long-term average S&P annual return of 9.8% is used, the suggested allocation to wine drops to 38% at a Sharpe ratio of 0.65, compared to the S&P Sharpe ratio of 0.45. It is important to note here that LIVX does not include storage costs to wine, which reduces capital appreciation and could change portfolio performance substantially. More information on this subject will follow in the limitations section, but here it is important to repeat that this analysis does not focus on suggested portfolio allocation. For purposes of demonstration, an annual storage cost of 4% of the purchase price, which is substantially higher than estimates by previous studies, would still lead to a recommended 5% investment in wine with the rest in the S&P.

4.2 Hipgnosis music fund analysis

Since its IPO in July 2018, the Hipgnosis Songs Fund has grown at an annualized 5.7% with a 7.0% standard deviation. The S&P 500 returned 19.1% at a standard deviation of 17.5% over the same period. See Figure 6 for the growth of one dollar over the observation period.
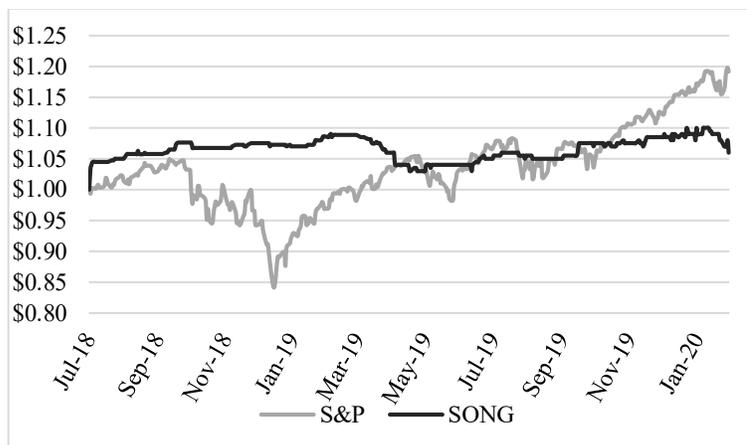
Figure 6. Growth of $1, SONG

Source: Authors' compilation

The picture painted by the returns to the Hipgnosis Music Fund is one of indifference to the market. There is some variance in price movements, but SONG seemed unmoved by the biggest market movement over the time horizon, the October 2018 selloff. The biggest jump in price is at the IPO, where shares jumped 3.5% on day one. This is nearly 9 standard deviations away from the average daily return over the rest of the sample period. Outside of day one, only three days saw a price increase of greater than 1% and all were less than 2%. This initial 3.5% price hike on the first day is credited to mispricing in the IPO and is excluded for purposes of diversification analysis. Without day one returns, annual return and standard deviation are 2.4% and 6.2%, respectively.

Unsurprisingly, CAPM beta is very low at 0.036 with an alpha of -0.0077. The regression fails to test for significance at the 95% confidence level, so the small positive exposure SONG shows with the S&P 500 should not be relied upon for purposes of analysis. The negative alpha is statistically significant, signaling underperformance relative to the S&P 500. Figure 7 shows returns for SONG and the S&P and the regression line between the two.
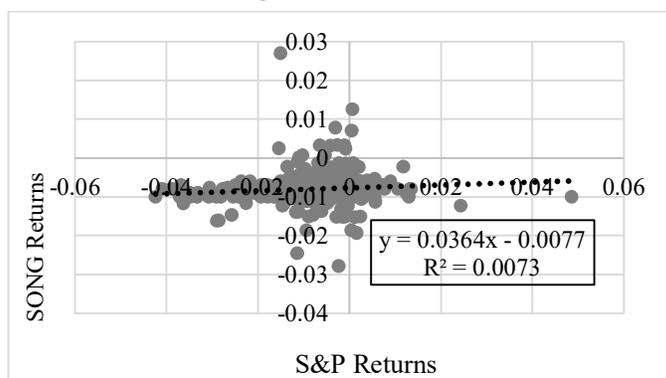
Figure 7. SONG vs S&P
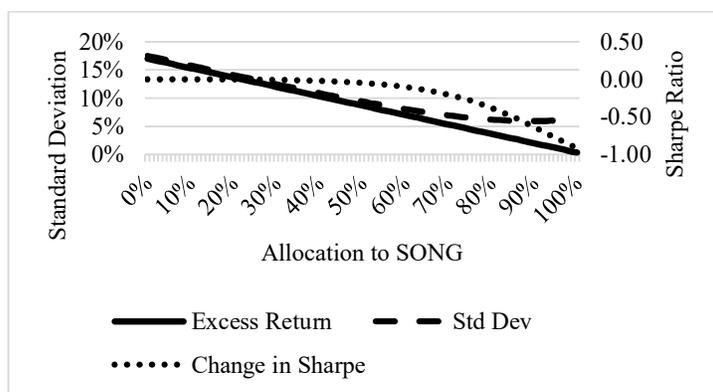
Source: Authors' compilation

SONG demonstrated a positive covariance with the S&P 500. The correlation coefficient is 0.04, suggesting it has almost no correlation with the price movements of the market and could provide diversification benefits to the portfolio. Figure 8 shows the efficient portfolio frontier for combinations between SONG and the S&P.
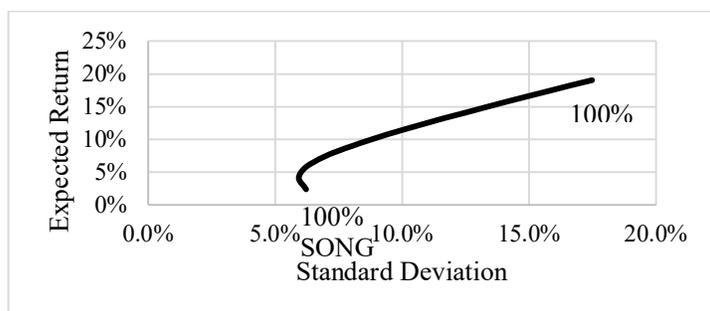
Figure 8. Efficient portfolio frontier, SONG

Source: Authors' compilation

Due to the virtual non-correlation with U.S. equities, a small investment in SONG will result in a risky portfolio with a higher Sharpe ratio than otherwise attainable. However, the low returns are dominated by the S&P 500, so the recommended allocation by this model is low. Figure 9 highlights diversification benefits to holding varying levels of SONG and the S&P 500.

Figure 9. Diversification gains, SONG

Source: Authors' compilation

A very slight improvement in the Sharpe ratio is observed when allocating 5% to SONG and 95% to the S&P 500. The Sharpe ratio of the pure S&P 500 portfolio is 0.97199 and rises to 0.972150 with 5% SONG. However, this 0.016% improvement due to diversion from an S&P 500 index would not likely be worth the transaction and rebalancing costs required to maintain such a portfolio. If the long-term S&P 500 return of 9.8% is used, suggested allocation to SONG rises to 19% with a 0.46 Sharpe ratio, compared to the S&P Sharpe of 0.451. This analysis

depends significantly on the risk-free rate. In the current model, annualized one-month Treasury bills over the analysis time horizon place the risk-free rate at 2.06%. However, fluctuations can significantly alter the suggested risky portfolio composition. For example, reducing the risk-free rate to 1.5% pushes up the excess return, the numerator of the Sharpe ratio, and puts suggested allocation to SONG at 23%. This revised allocation would improve the Sharpe ratio by 0.55%.

Risk almost declines linearly with allocation to SONG, consistent with its low standard deviation, and the minimum variance portfolio occurs at 90% allocated to SONG and 10% to the S&P 500. However, this would not be a reason to include more than 5% in the portfolio. A less risky portfolio can be achieved without sacrificing Sharpe by mixing in risk-free assets with the maximized Sharpe risky portfolio.

5. Discussion

Both assets under examination, wine and music, can be attractive investment opportunities due to diversification potential as demonstrated by the portfolio Sharpe ratio improvements. Their overall lack of correlation with the overall financial markets can improve the risk-adjusted returns of a portfolio. But what reasons can be given for their immunity to stock market movements?

Wine is an asset with the possibility for long term capital appreciation and a sustained history of demand in the marketplace. On a day-to-day basis, events in the capital markets will not improve nor dissuade consumers, who are largely high net-worth individuals, from purchasing wine. Barclay (2012) reports that wealthy wine owners would require a price increase of 50% in order to sell their collection, which demonstrates that financial gain has little impact on the trading of wine. Where wine does begin to correlate with capital markets is during dramatic financial events. As shown in Figure 1, wine prices jumped then crashed in response to both the 2008 crisis and the Bordeaux Bubble. However, the data show that even during dramatic market events, wine prices do not conform so neatly to movements in the equity markets. When the analysis time horizon was limited to these large market events, CAPM beta was still less than 0.5 with an R^2 of 0.2. Although a Sharpe analysis has shown significant benefits to including a large investment in wine in a portfolio, risk-averse investors should be wary of exposure to tail risk in wine returns with regard to market-moving events. Wine consumers may be somewhat immune from regular variations in the overall market, but even extremely wealthy individuals will be hesitant to buy fine wines during a crisis.

Surprisingly, the price history over the full analysis period showed that wine dominated an equity portfolio, contrary to the findings of Burton and Jacobsen (2001). Manipulation of the analysis period can substantially change the returns to

the S&P 500. When using the long-term average S&P 500 growth rate of 9.8%, the diversification model still suggests a substantial portfolio allocation to wine. This demonstrates diversification potential for wine, which is consistent with Fogarty's findings (2010).

The performance of the Hipgnosis Songs Fund is driven by royalties to its underlying assets, copyrights on popular music titles. For the average stock on the market, profitability and returns to equity investors are highly influenced by the broader capital markets. Conversely, returns to the fund are a function of the popularity of the music, which, arguably, is unrelated to financial markets. A market downturn will not make the average listener switch from Bieber to Bach, and an upswing will not turn an R&B fan into a hip-hop junkie. There may be some exposure to extreme market swings, in a similar vein as wine, since subscribers to streaming services may cut music out of the budget during tough times. But barring these events, music is relatively insulated from the broader market, which is supported by Graddy and Margolis (2011) who show a negative correlation between violins and equities.

Music correlation to market movements has been studied in a different light by Maymin (2012). He analyzes the annual average beat variance of the songs appearing on the U.S. Billboard Top 100 and finds a significant negative correlation with stock market performance. In fact, the correlation was also found for the previous year, indicating music beat variance could act as a tool to predict the next year's market volatility. Despite the statistical evidence, the correlation posited in this study seems spurious and does not significantly impact arguments for diversification.

As long as market demand for music does not drop dramatically, especially with respect to streaming services like Spotify and Apple Music, performance of the fund will be driven by managers' continuing ability to expand its portfolio into successful music artists' catalogs.

6. Limitations

As noted previously, this study does not aim to recommend specific allocations to asset classes. It rather aims to show diversification potential. One reason for this caveat is related to returns on wine. The Liv-ex index used in this study represents the price movements of the 100 most traded wines on the fine wine market, but its level does not necessarily have a direct interpretation. The publicly available information does not indicate that the index level is representative of an average price for underlying wine. This fact makes applying a storage cost discount to annual returns difficult. Previous studies have subtracted a dollar amount, ranging

from $0.45 (Jaeger, 1982) to nearly $17 (Krasker, 1979) per case. However, without an average case dollar amount from either of these studies or an average case dollar amount on the Liv-ex 100, storage costs cannot be reasonably applied to this study. That said, the storage cost relative to the price of an average case may be minimal. Fogarty (2010) excludes storage costs entirely from his analysis because benefits from Australia's lenient taxation of wine would largely cancel out any storage costs.

In the wine analysis, the S&P 500 index annual returns were lower than the long-term average of 9.8%. In the music analysis, the S&P returns were higher. Suggested portfolio allocations for diversification changed substantially when using the long-term growth of the S&P, and this is probably the better approach in real-world investing. Assumptions about the long-term growth rate of the S&P 500 should not be made on a subsample of data, but on long averages over the lifetime of the index.

Another limitation is the immaturity of the Hipgnosis Songs Fund. Since the fund was launched in July 2018, the study covers less than two years of price data. Though daily price points were used in the analysis to maximize the number of observations, future performance and fund popularity may change the way SONG correlates with the market.

The lack of correlation observed may also be due to relative market illiquidity. Out of the 401 trading days observed, 300 trading days showed a return of exactly 0%, which seems like a liquidity red flag. Since its IPO, SONG had an average daily trading volume of 474,286 shares which gives a dollar volume of $50,540,451. At a market capitalization just above $650,000,000, an average of 7.7% of the market cap is traded per day. Compared to highly liquid mega-cap firms which often trade at less than 1% of market cap per day, SONG appears to be healthy. The bid-ask spread is another measure of liquidity. The current spread is 1.4% of market price, which is not out of line with other small-cap stocks. Traditional measures do not suggest liquidity problems despite the overwhelming lack of price movement. This may be a function of its robust insulation from the market and is a topic for potential future research.

7. Conclusion

Modern portfolio theory provides a framework through which diversification benefits can be studied and compared across diverse investment classes. With newly available datasets highlighting the price movements of wine and music, as represented by the Liv-ex Fine Wine 100 Index and the Hipgnosis Songs Fund, the diversification benefits of these "investments of passion" can be analyzed.

By employing the methodology in Fogarty (2010), the authors have shown that the return to wine has outperformed the S&P 500 over the analysis period and that both wine and music have low correlations to the equity market. Assets with low correlations to a broader portfolio are of particular interest to investors, as they can present significant diversification benefits (Markowitz, 1952).

Depending on external conditions, such as returns in the equity markets, the risk-free rate, and storage costs of wine, an investor looking to maximize his or her risk-adjusted returns may benefit from investments in alternative assets like wine and music.

The paper contributes to the literature on alternative asset investment. The authors extend the existing findings by showing the diversification benefits of wine and music investments. While these investments traditionally have been available to only sophisticated investors, the introduction of Hipgnosis Songs Fund as a publicly traded stock enables more investors to include music investment in their portfolios. If proven successful, Hipgnosis Songs Fund can pave the way for other alternative asset investments to be available to retail investors.

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