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ALTERNATIVE INVESTMENTS: VALUATION OF WINE AS A MEANS FOR PORTFOLIO DIVERSIFICATION

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Abstract. This article analyses wine as an alternative investment tool and its relevance for investment portfolio diversification. Advantages and disadvantages of alternatives, benefits and weakness and peculiarities of investing in wine are systemised. In addition, the article looks at statistical data analysis of fine wine market and compares wine with other investment tools. The examination is based on three investment instruments: US equities (using S&P 500 index), bonds (using US 20-Year treasury constant maturity rate/DGS20) and wine (based on Fine Wine Investable index) using 1993–2012 (end of year) data. The investment portfolios made with two and three above-mentioned investment tools basing on H. Markowitz's investment portfolio theory and effective curves are presented. It was found that return on investments only from equities and bonds or wine and one of these traditional instruments are signally less than from the investment mix of all three tools. Furthermore, portfolios made only from equities and bonds provide the lowest return compared to others. Choosing from two investments portfolios, results of bond/wine portfolios propose higher return with the same risk level compared to equities/wine portfolio. Consequently, despite some slowdown of wine index during financial crises, wine relevance for portfolio diversification in post crises period was proved.

Keywords: alternative investments, investment portfolio, portfolio diversification, fine wine, wine market indexes, the Liv-ex.

JEL Classification: D14, D31, G110.

ALTERNATYVIOS INVESTICIJOS: VYNO, KAIP PORTFELIO DIVERSIFIKAVIMO PRIEMONĖS, VERTINIMAS

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Santrauka. Straipsnyje nagrinėjamas vynas kaip alternatyvi investicija, vertinama, ar ši priemonė tinkama investiciniam portfeliui diversifikuoti. Susisteminami alternatyvių investicinių priemonių privalumai ir trūkumai, investavimo į vyną galimybės, silpnybės ir ypatumai. Atlikta investicinio vyno rinkos statistinių duomenų analizė, vynas lyginamas su kitomis investicinėmis priemonėmis. Tirti pasirinktos trys investicinės priemonės: JAV akcijos (S&P 500 indeksas), JAV obligacijos (JAV 20 metų iždo nuolatinio termino norma / DGS20) ir vynas (*Fine Wine Investable* indeksas), naudojant 1993–2012 m. pabaigos duomenis. Remiantis H. Markowitz investicinio portfelio teorija, sudaryti investiciniai portfeliai iš dviejų ir trijų minėtų investicinių priemonių derinių ir pateiktos efektyvios kreivės. Nustatyta, kad, investuojant visas lėšas vien į akcijas ir obligacijas ar vyną ir šių finansinių priemonių derinius, gaunamas kur kas mažesnis pelningumas, nei investavus į visų trijų investicinių priemonių derinį. Be to, portfeliai, sudaryti tik iš akcijų ir obligacijų, duoda žemiausią grąžą, palyginti su kitais. Renkantis dviejų priemonių investicinius portfelius, obligacijų / vyno portfeliai pasiūlė didesnę grąžą esant tai pačiai rizikai, lyginant su akcijų / vyno portfeliais. Vadinasi, nepaisant nedidelio vyno indekso smukimo finansinės krizės metu, vyno tinkamumas portfeliui diversifikuoti laikotarpiu po krizės pasitvirtino.

Reikšminiai žodžiai: alternatyvios investicijos, investicinis portfelis, portfelio diversifikavimas, investicinis vynas, investicinio vyno indeksai, Liv-ex.

Introduction

Development of economy and increase in living standards encourage people to look for appropriate and effective ways to use free funds, i.e. to invest and protect savings from negative factors, reduction in value and at the same time ensure additional income in both short and long run. Private investors have a wide choice of possible investment instruments with different suggested returns and corresponding risk in their home countries and abroad. However, a wide range of options poses a problem: how to diversify an investment portfolio to sew up the rise of the desirable profit and risk reduction as much as possible.

In recent years, turbulences in financial markets have notably encouraged investors to seek for other investment possibilities. Hence, investors try to find a new sphere for possible placement of funds and to renew their investment portfolios with instruments that are more assorted. Scientists have been warning that it is possible to upgrade the investment return and reduce the risk by additional portfolio diversification with alternative investments, including wine, as the most important feature of such investments is that they have little correlation with traditional investment instruments and, in spite of that, they are often especially risky yet earn significantly higher returns.

One of the most important factors, determining increment of the popularity of wine as an investment instrument is new developing markets. The rise in living standards influences investments in collectibles, including wine, which is popular among investors not only due to financial results but also for pleasure, as holding rare and expensive wine may bring emotional satisfaction. In addition, the analysis of historical data shows that returns on wine exceed returns on equities and bonds as well as those of on a number of other alternatives. However, as the interest in wine investments is growing, this market is not very big compared to other alternative instruments as it requires some initial funds and specific knowledge.

Wine as an alternative investment is analysed in this article as it becomes more popular worldwide but its benefit for diversification is still insufficiently analysed and investigated in the scientific literature. The purpose of the article – to assess the relevance of wine for portfolio diversification. The methods used are analysis and generalisation of scientific literature, comparative, graphic analysis, statistic and correlation analysis, portfolio formation and graphical representation of data.

1. Consideration of investment portfolio diversification

Markowitz (1999) states that the best way to reduce risk is portfolio relieve or portfolio diversification. Efficient asset allocation is a vital mechanism for the improvement of investment portfolio performance and the attainment of the risk-return profile anticipated by an investor. Diversification is defined as a strategy for the reduction of exposure to risk by forming a portfolio of assets with less than perfectly correlated rates of return (Hibbert *et al.* 2012). It is necessary to reallocate a portfolio if the return and risk are at variance with investment goals and expectations. The factors that affect decisions associated with personal asset allocation are the risk level and return revenue of investment products, the timing strategy (the time of buying and selling products), and the portfolio.

Additionally, individuals may have different investment needs that reflect their personal backgrounds and life experiences as well as their individual personalities. Such factors can make personal asset allocation decisions very difficult (Shyng *et al.* 2010). The amount of available funds, competence, experience and living environment also affect investments (Abreu, Mendes 2010). Furthermore, investor's financial literacy make a fair influence in portfolio diversification (Hibbert *et al.* 2012). Veld-Merkoulova (2011) empirically investigated the impact of age and self-reported planning horizon on asset allocation decisions of individual investors. She found that age and an investment horizon play different roles in determining risky portfolios of investors. Considering the total risky investments, including real estate, the share of risky assets declines with age. The planning horizon tends to influence only investments in financial risky assets, such as stocks, options, and mutual funds. A longer planning horizon leads to an increasing share of risky financial investments.

A portfolio is considered as sufficiently diversified when it is nearly insensitive to changes of individual investment instruments. Thereby, investors choose various investment tools (e.g.. wine, real estate, arts, different securities and others), anticipating that the value of cut-price instruments will compensate for upped instruments and the total portfolio market value will not decrease substantially. However, correlations between alternative assets and traditional assets increase with time, as more investors start investing in alternatives. The increasing correlations drive portfolio managers to search for fresh alternative assets that will provide the required diversification for their portfolios (Das *et al.* 2013). Diversification benefits tend to be especially prominent in times of unexpected inflation and declining stock markets (Jacobs *et al.* 2014). Of course, diversification does not guarantee a profit or eliminate the risk of loss (Wilson 2014).

In summary, the structure of investment portfolio differs depending on individual reasons and investor goals. The success of a portfolio relates to its accurate diversification. A well-diversified portfolio is characterised by little correlation between investment tools; thus, it is necessary to spread between different asset classes.

2. The concept and main characteristics of alternative investments

The term "alternative investment" determines untraditional investment tools. Based on Shawky *et al.* (2012), alternative investment vehicles include venture capital, business angels, private equity, hedge funds, infrastructure, real estate, and sovereign wealth funds. In addition, they underline their rapid growth in the past decade. Mulvey (2002) assigns the following to non-traditional assets: hedge funds, venture capital, private equity, real estate holdings, and timber holdings; in addition, he states that these investments have had a positive impact on performance and consequently have attracted the attention of investors. Wilson (2014) proposes to subsume real estate, private equity, infrastructure, liquid alternatives/hedge funds, commodities, etc. Thus, alternative investments can be considered as all investments except for equities and bonds. Discussions about such collectables as art, wine, etc. and their applicability for investment portfolios can be found in research outputs by Cardebat, Figuet (2010), Coffman, Nance (2009). These researchers analyse wine as an alternative tool. Campbell (2008a) investigates violins; and in the paper by Campbell (2008b), art is analysed as an alternative investment. This particular article, considers wine as an alternative investment together with other valuables such as art, violins, coins, stamps, etc. (see Fig. 1).

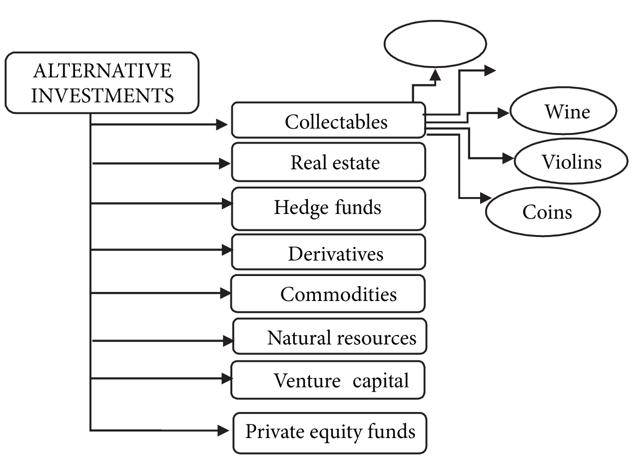

Fig. 1. Classifications of alternative investments (Shawky *et al.* 2012; Cardebat, Figuet 2010; Campbell 2008a, 2008b; Mulvey 2002; Wilson 2014)

Assortment of alternative investments is sufficiently wide (Fig. 1); however, the most important issue is to perceive the main features of such investments, due to which it is worthwhile for an investor to add them to the portfolio (Table 1).

Table 1. Features of alternative investments (Guarasci 2010; Coffman, Nance 2009; Westminster consulting 2012; Wilson 2014; Mulvey 2002)

Advantages	Disadvantages
Little correlation with traditional investment instruments	Requires some funds and knowledge
Higher return than of traditional investment instruments	Difficult to determine the current market price
Wide range of investments	Rather illiquid
Accessible emotional satisfaction (in some cases)	Alternative markets are less informative than those of traditional tools
	No periodic income

One of the most important features of alternatives is little correlation with traditional investment instruments, due to which they fit for diversification (Coffman, Nance 2009). In addition, many investment professionals state that alternatives earn higher returns than traditional investments. Mulvey (2002) distinguishes alternative investments by the following characteristics: illiquidity, wide range of outcomes (top 10% performers versus bottom 10%), high-return benchmarks, unpredictability of performance and (possible) unique return. However, these investments relate to other features, due to which they become especially risky. First of all, although available to a wide community, alternatives are better accessible for professionals and institutional investors due to required good knowledge and initial funds. Furthermore, a specific feature of such investments is the shortage of required information, deficit of historical data on risk and return and difficultness in defining their value contrary to traditional investments, the information of which is easier to access (Guarasci 2010). Another cause stimulating investments into alternatives is that such assets as collectables could bring personal delight and satisfaction and a variety of possible alternatives opens broad possibilities for the choice of an investor.

Summarizing features of alternative instruments, it is necessary to underline the following: higher return compared to traditional investments that recompenses high risk, necessity of initial funds and specific knowledge. Consequently, alternative and traditional investments could shift or stabilise the portfolio return and lower its risk.

3. Peculiarities of fine wine and wine market

Although people have been purchasing fine wine for investment for more than 150 years (Ricardo 2013), during the last decade, and especially amid the financial crisis, wine investments were particularly in great request. The notable interest in wine investment is partly due to the belief that fine wines are recession-proof, partly to the outstanding performance of fine wines in the pre-crisis period (Erdos, Ormos 2013).

The leading wine producers are France, Italy and Spain, but French wines are associated with the highest increase of value (Agostino, Trivieri 2014). Investment-grade wines make up for less than 1% of the global wine market, with approximately 80% coming from Bordeaux (Ricardo 2013). Bordeaux wines have increased dramatically in the last few decades because the annual profit yield can be tremendous (Jones, Storchmann 2001). There are three options for wine investments: wine funds, private collections and wine futures – the En Primeur channel (Coffman, Nance 2009).

Wine differs from other investments: it is a perishable product, and its gustatory attributes are subjective. Aging has a positive effect on wine pricing. This is due to the increasing maturity as well as the growing absolute scarcity, which is expressed in the size of a property, with small properties producing less vintage wine and, therefore, having less of it on the market (Jones, Storchmann 2001). As wine gets older, it certainly gets rarer, potentially fuelling the rise in prices through contracting supply. Of course, this process has its limits because every wine eventually goes over the hill, but for the finest wines, this might not happen until they are 80-plus years old or in even older. For example, a single case of Cheval Blanc 1947 was sold at Christie's in 2007, 60 years on, for £75,000 (Brown 2009). However, the aging of wine expresses storage costs and opportunity costs (costs of tying down capital as well as borrowing on credit) (Jones, Storchaman 2001).

Furthermore, unlike traditional financial products, it cannot be sold immediately (Cardebat, Figuet 2010). Illiquidity and data accessibility compared with securities' market are negative wine features. Transaction costs in fine wine are very high, at around 10% to 15% between bid and offer. Insurance and storage costs are at somewhere around £9 a case p.a. (Brown 2009). However, fine wines are favourably taxed and prices are not closely linked to those of conventional investments (Kourtis *et al.* 2012). In addition, wine critics should evaluate the wine. Wine dealers, critics and auction houses have various estimation systems. However, the most influential wine assessor is considered to be R. Parker, who uses 100 score system (Jones, Storchmann 2001). Ali *et al.* (2008) estimated that the impact of the famous wine expert is very important for highly graded wines. As well as other investments, wines have both advantages and disadvantages (Table 2).

Table 2. Wine investing benefits and weakness (based on Cardebat, Figuet 2010; Jones, Storchmann 2001; Brown 2009; Wilson 2014)

Benefits	Weakness
Holding rare valuable	Risk to purchase falsification
Wine could be consumed	Illiquid investment
Has minimum correlation with other investments	Possible storage conditions and expenses
Possible diversification benefit	Do not generate any periodic income, only from sale
Prices do not fluctuate as often as those of equities	Investment return related to fashion trends

Desirability of these investments is related to the lack of interdependence on securities market (Wilson 2014). Low correlation with other investments is one of the main advantages and due to this, it is appropriate for portfolio diversification. Furthermore, prices fluctuate less than those of equities. For a number of investors, it is very important that this investment is a valuable one and could be consumed in the event of failure. Wine does not pay dividends or interest and requires optimum storage conditions to avoid breakage and maintain the quality, which entails costs (Cardebat, Figuet 2010). Thus, one of the major disadvantages compared to other alternatives – wine does not generate any additional periodic income. Even art could be let for galleries. To avoid fraud and ensure reliability of transactions, deals should be organised via wine auctions and exchanges.

Additional risks related to wine investments are: limited market size, exchange rates, fraud, the effect of taxes, but solid historical returns and low standard deviation, and long-term investment strategy (Coffman, Nance 2009). Consequently, it is rational to invest in wine when it relates to a hobby as such investment depends on the label and vintage (Cardebat, Figuet 2010). Although one never knows when is the best time to invest in wine, just as in any other investment field, only well sophisticated participants of this market can earn

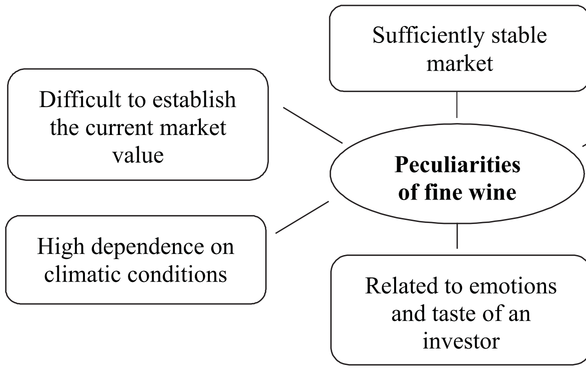

Fig. 2. Peculiarities of fine wine market (Erdos, Ormos 2013; Coffman, Nance 2009; Goulet, Morlat 2011; Storchmann 2012; Ashenfelter 2008)

on buying and selling wine. The main features of wine market are presented in Figure 2.

One of the main wine market features is stability. Wine markets are not affected by recession, interest rate changes or securities fluctuation (Erdos, Ormos 2013). It has an obvious advantage against the securities market that is related to frequent price fluctuations and to changes in economic indicators. The wine market is little regulated, only funds based in Europe and the Cayman Islands are lightly regulated, creating the need for significant due diligence, as fees can be high and disclosures can be minimal (Coffman, Nance 2009). It should be notable that securities usually are exchange traded while wine could be traded in a non-exchange market as well. Due to securities' exchange, there is little possibility to overpay or underpay as the prices are determined by the demand and the supply. While in wine market, even a respectable expert could overreach (World Wealth Report 2013). As the demand of fine wine always exceeds its supply due to the limited amount of good harvest wine bottles, each consumed bottle shifts the value of the remaining ones (Coffman, Nance 2009; Goulet, Morlat 2011). Moreover, this market differs from traditional financial markets in terms of a deep relationship with emotions, taste and education of an investor.

Goulet and Morlat (2011) state that in viticulture, four main factors determine the quality of wine: environmental conditions of production, varietal selection, vine management, and winemaking practices. Wine differs from traditional investments and other alternatives by dependence on climatic conditions while other alternative investments incur no impact related to climate (Storchmann 2012). However, Erdobs and Ormos (2013) argue, that weather conditions, which determine the quality of the vintage, play no role in setting the prices of new wines, but the quantity produced does, which is not related to the quality. They propose that bad vintages are overpriced and good vintages are under-priced when they are young. On the other hand, such feature makes the wine market more stable. This phenomenon persists for up to 10 years following the vintage year. Rational buyers should avoid bad vintages and concentrate on good ones if they aim to store wines as an investment (Erdobs, Ormos 2013). The analysis made by Ashenfelter (2008) on the effects of age suggests that weather is an extremely important determinant of the quality of a wine vintage and its price at maturation.

The price of fine wine also depends on producer's reputation (Bombrun, Sumner 2003). Wineries with longer experience usually sell wine more expensively as traditions and greater skills allow them to produce better quality wine. While on the other hand, the price is more dependent on the prestige of a winery. Roma *et al.* (2013) ascertain that a wine price strongly depends on objective features such as vintage, alcoholic content, geographical origin, grape variety, producer size and cellaring potential. Furthermore, the wine price is correlated positively with the relative composition of the grapes. According to the results of research (Goulet, Morlat 2011), it was assumed that high sugar values have a positive effects on wine prices and that high acid values have a negative influence on wine prices.

As it was already mentioned, transaction costs in fine wine, insurance and storage costs are very high; investments in wine are usually profitable only in a long prospect and this means that wine must be able to age for at least 25 years, with the maturity (peak value) occurring no earlier than at the 10th year (Ricardo 2013). Jones and Storchmann (2001) established that the main factors, influencing wine prices are climate, Parker and age.

Developing markets also have an impact on wine prices and have shifted them in recent years due to improved economic situation, which rapidly enhanced the collectable wine prices. The total volume of imported wine climbed from 76.5% in 2010 until 80.9% in 2011 (Business Monitor… 2013). China is already the world's fifth largest wine market and the total consumption may rise to the second largest in 2016. Behind it is the USA, surpassing the old world giants France, Italy, and Germany (Xu *et al.* 2014).

4. Analysis of fine wine data

In the period 2000–2011, the world wine imports grew significantly from 2004 to 2007, and recovered in 2010, after a decline in 2008–2009 due to the international economic crisis. In 2011, the world imports reached a new high: €22.6 billion for 3.4 million hectolitres. Comparing the average of 2000–2001 with that of 2010–2011, the world imports have increased by 53% in value and 58% in volume (Mariani *et al.* 2012).

According to the World Wealth Report (2012), fine wine was among nine most popular collectables and took the third place. A year later, the market of fine wine together with antiques and coins (Fig. 3) amounted to 26% of all alternative investments (the World Wealth Report 2013). While this report does not indicate the share of wine itself, the analysis of the World Wealth Report (2008–2013) shows that this market increases and, during 2008–2013, it doubled from 12% up to 26% (the World Wealth Report 2008, 2009, 2010, 2011, 2012, 2013). Obviously, it was also related to the rise in investments into antiques, coins as well as wine.

Investors used to follow wine indexes – the main market indicators of fine wine that reflect wine market trends and help investors to make decisions. Indexes are important as they help to predict the trend of any particular investment and to compare it with other instruments. The most comprehensive information about wine indexes is presented in "Liv-ex" exchange website where four indexes defining the wine market are described. Liv-ex Fine Wine Investables ("LFV INV") has the longest history, following the prices of nearly 200 wines from the main 24 Bordeaux region wineries and reflecting the typical investment portfolio including wine effectiveness (Liv-ex 2013). Namely, this index has been chosen for this research to assess the propriety of wine for investment portfolio diversification. Figure 4 reveals the movements of Liv-ex Fine Wine Investable and S&P 500 indexes.

The comparison of these indexes definitely proves the existence of stability in the wine market contrary to the equities market with much more and sharp fluctuation. This indicates that the wine market is less dependent on economic downturns compared to equities. From the very beginning of Liv-ex Fine Wine Investable index until 1993, its value has been nearly stable until a slight increase in 1994 to 1997; and with slim fluctuations on the same level till 2006, when a considerable upturn of the index started; and lasted until 2007, as the wine market was also affected by the crisis. Although the growth rate of the wine index slowed down, it was not as sharp as in equities market. Furthermore, the wine market started to recover in the second half of 2008. Thus, wine as an alternative investment became popular after the crisis; and after a rapidly recovery, wine prices started to boom. Mostly the index grew from 2009 to 2011, when it reached the best result since its creation (see Fig. 4).

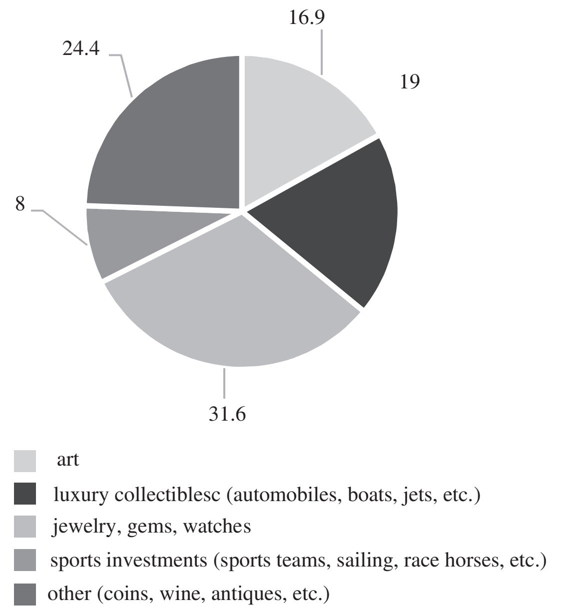

Fig. 3. Share of wine market in alternative investments, 2013 IQ, percentage (World Wealth Report 2013)

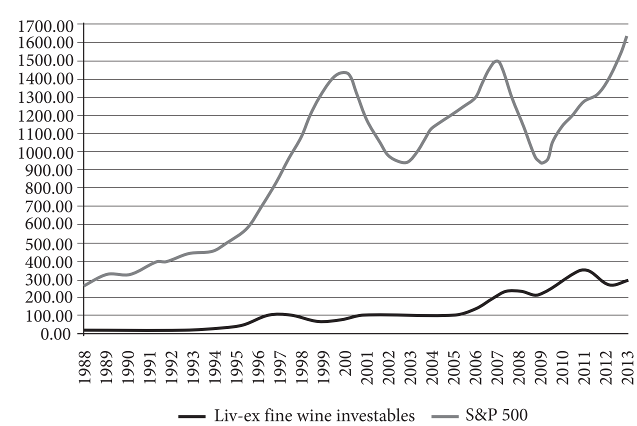

Fig. 4. Comparison of dynamics particular to Liv-ex Fine Wine Investable and S&P 500 indexes (1988–2013) (based on Liv-ex 2013; Finance. Yahoo 2013)

The comparison of risk and return of four alternative investments – wine, art, gold, silver and equities (FTSE 100) – is presented in Figure 5. It covers 20 years until September 2011.

Wine surpasses the return on securities, art, gold and silver that are next after wine according to profitability (Fig. 5). Furthermore, the risk of investments in wine is the lowest among them.

Figure 6 represents data on wine and equities return and shows that during 1950–2007, wine for a long time kept up with equities and even exceeded their return in 1950–1985 and 2003–2007; consequently, by 13.43% (when the return on wine was 15.2%) and 13.11% (while the return on wine was 15.3%). This book maintains that wine is more profitable than equities, by 2.19 basis points, contrary to the

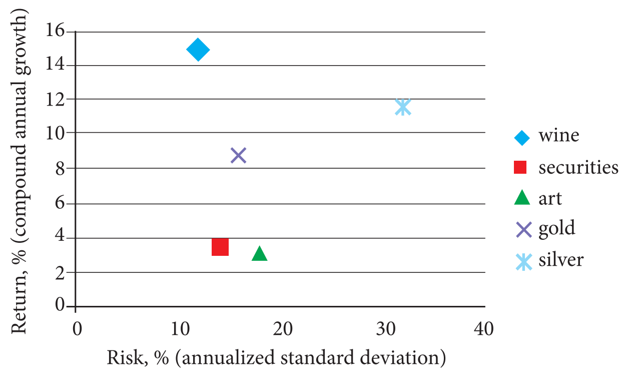

Fig. 5. Return and risk of alternative investments and stocks during 1992–2011 (based on Westminster Consulting 2012)

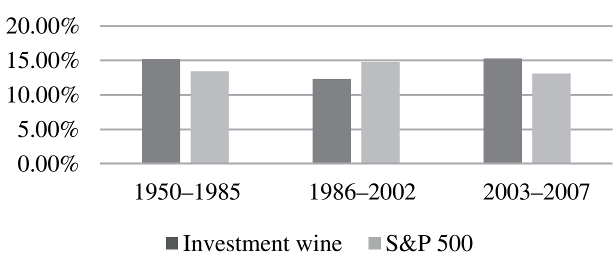

Fig. 6. Comparison of wine investments and S&P 500 return (based on Rare Sips Wine Investments 2013)

period 1985–2002, when equities surpassed wine by 2.5 basis points.

The analysis of historical data shows that wine brought higher returns not only compared to equities but also to other alternatives. Furthermore, the comparison of movements of wine and equities indexes proves that the wine market is less sensitive to economic downturns compared to equities. In summary, wine is a stable investment and according to returns, it overtakes a number of other investment tools.

5. Investigation of wine impact for investment portfolio diversification

The investor strives to maximise return and minimise its risk. The originator of the modern portfolio theory Markowitz investigates the problem of portfolio construction using the standard deviation, which represents level of risk – the higher is the deviation, the higher the risk and vice versa. However, Markowitz model does not propose the optimal portfolio but only defines the effective curve, on which all portfolios are optimal. The effective curve defines portfolios with a fixed risk within the maximum return or, vice versa, with a fixed return within the minimum risk (Markowitz 1999).

To assess the feasibility of wine for diversification, investment portfolios were created with traditional investment tools (equities and bonds) and wine additionally. Fine Wine Investable index (LVX INV), the eldest and mostly used worldwide as a reliable wine market instrument, and S&P 500 as the indicator of the largest and the most developed in the world US market, were selected for the investigation. The correlation analysis was made using Microsoft Excel. Pearson's correlation coefficient was calculated between wine and equities indexes (using 1993–2012 data) and the significance of the correlation coefficient was evaluated. The correlation coefficient between wine (LVX INV) and equities (S&P 500) indexes is 0.46 and means a slightly positive correlation[1]. To calculate optimal portfolios and to draw the effective line of a certain portfolio, the material by Craig W. Holden was used (Holden 2008). The set risk and return data of equities, bonds and wine for the period 1993–2012 (end of year) were used for the modelling of investment portfolios (Table 3).

Table 3. Return and risk of selected investments (based on Ricardo 2013; Standard & Poor's Financial Service LLC 2013; Financial Forecast Centre 2013)

The name of an investment tool	Return (%)	Risk (%)
Wine (Fine Wine Investable index)	13.47	12.00
Equities (S&P 500 index)	6.05	15.39
Bonds (US 20-Year treasury constant maturity rate/ DGS20)	5.29	1.29

Eighty portfolios were created using various combinations (proportions) of securities in each (60 portfolios including two investment instruments (equities/bonds, equities/wine, bonds/wine) and 20 portfolios including all three investment tools).

To show the impact of wine on diversification optimal portfolios, the effective curves were drawn (see Fig. 7). The dotted line in Figure 7 indicates portfolio equities/bonds while the continuous line represents a portfolio made from all three tools, including wine. The diversified portfolio with wine shifts the effective curve above the effective curve of equities/bonds portfolio (Fig. 7). Points B1 and B2 mark the initial points of portfolios' effective curve. The risk of the initial points of both portfolios is equal 1.29%; however, the portfolio created from all three investment tools is more profitable. As within this risk, the curve rises and (within the same risk) proposes 5.53% return while the portfolio from two investment tools earns 5.5% return. This means that portfolios from all combinations (equities, bonds and wine) are more profitable than effective portfolios excluding wine, starting with the initial point where the risk is equal 1.29%.

[1] With the significance level , the correlation coefficient is insignificant and proves the statements of other researches, that there is little correlation between wine and equity markets.

This proves that additional portfolio diversification with wine is valuable. However, it does not reduce the risk but increases the portfolio return by 0.03 basis points. For example, the analysis point D1 (Fig. 7), where the risk is 20%, could produce a 6% return from the portfolio equities/bonds when at the same time, additional diversification with wine could suggest about 19% return (point D2 in Fig. 7). Therefore, additional diversification of the portfolio with wine increases the portfolio's effectiveness.

Figure 8 shows the comparison of curves of portfolios from two investment tools. One created from equities and wine (dotted line), another – from bonds and wine (continuous line).

Comparison of the effective curves shows a partial synchronisation (Fig. 8). Consequently, overtaking appropriate risk in this interval the same return will be gained in any of these portfolios. However, an investor should chose the portfolio created from bonds and wine as it endows a possibility to select from a wider risk and return range. Starting from the point F, where the risk is 13.20% and the return is 14.29%, the earned return will be higher with the same risk, choosing the portfolio created from wine and bonds.

Finally, the effective curves of all four created portfolios are compared to ascertain what portfolio is gainful for an investor and the benefit of including wine into portfolios (Fig. 9).

Figure 9 shows that the lowest return is gained from the portfolio created form equities and bonds (middle curve). The portfolios from equities and wine and from bonds and wine are much more profitable. It also demonstrates that the highest return for an investor is offered by the portfolio created from three investment tools: equities, bonds and wine.

The results prove the usefulness of wine for portfolio diversifications. There was no portfolio found that would not be impacted by addition of wine. All portfolios diversified with wine were gainful.

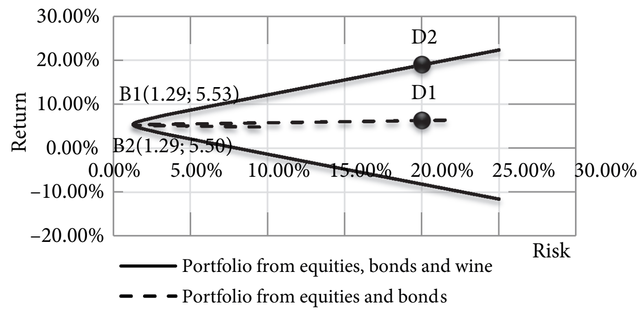

Fig. 7. Effective curves of portfolios equities/bonds and equities/bonds/wine

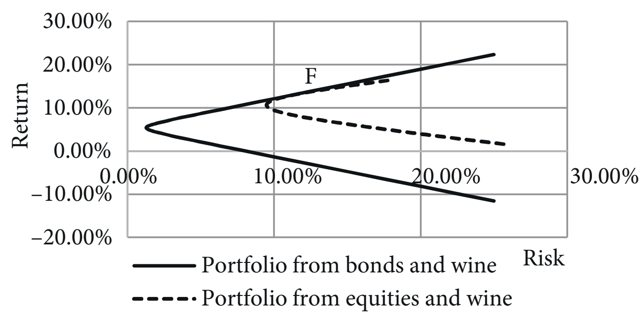

Fig. 8. Effective curves of diversified portfolios equities/wine and bonds/wine

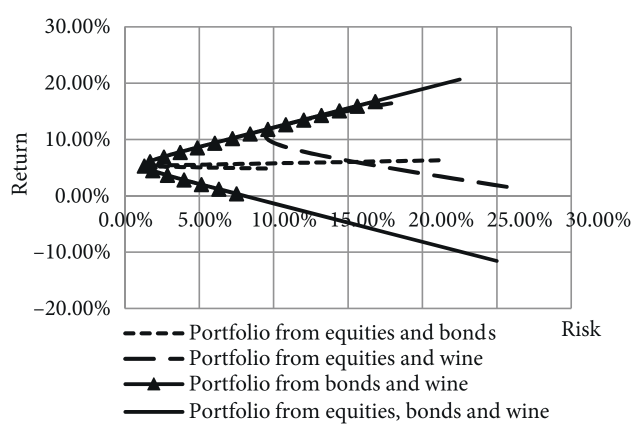

Fig. 9. Comparison of all designed portfolios

Conclusions

There is no solid classifications of alternative investments and wine is not even considered as a tool in majority of them. Still, all agree that alternative investments should be included into investment portfolios with other instruments, as their most important feature is little correlation with traditional investments. Other factor that drives investments into collectables and wine is the development of new markets, improving living conditions, the ability to purchase luxury goods, including wine that often intrigues investors not only because of financial gain but also for personal pleasure.

There are three options to invest in wine: wine funds, private collections and wine futures – the En Primeur channel. Wine has one specific feature that distinguishes it from other alternatives and collectables: it is a perishable product that can go bad due to inappropriate storage conditions.

Wine investments are not only profitable but also have additional characteristics that are typical for this market and that increase investment risk: the need for specific knowledge, low liquidity, high dependence on climatic conditions, difficultly in establishing the real price, and, due to transactions made not in the auctions or exchanges, a lack of publically available recorded data. Finally, wine prices depend on evaluation given by wine critics. This conditions moderate place among alternative investments though its popularity is growing. Investments in wine stand up only in the long run (up to the century) and it is crucial to choose an appropriate particular wine for investment purposes. The most suitable are French Bordeaux wines.

Popularity of wine has been increasing since 2006. During 2011–2012, investments in wine were rising by 10% and were on the third place between nine most popular collectables. Financial crisis of 2007–2009 did not influence the fine wine market as much. The movement of the eldest index Fine Wine Investable, created by Liv-ex exchange, did not show a downfall but only a slowdown in growth rates. This proves that wine is a sufficiently stable investment and its return exceeds the majority of other investments.

The correlation analysis obtained between Fine Wine Investable and S&P 500 indexes shows a weak correlation of 0.46 and proves that wine could be used for portfolio diversification. The created portfolios show that inclusion of wine both with equities and with bonds gives a higher return than portfolios made only from traditional securities. Comparison of portfolios wine/equities and wine/bonds demonstrates that the latter gives a higher return with the same risk in a particular segment. However, the highest return was obtained with all three tools – equities, bonds and wine. In some cases, it shows that diversification with wine helps to reduce a possible risk.

To use wine in investment portfolio with success, it is necessary to grasp peculiarities of the wine market. Only this could ensure a high enough return and a lower risk. However, even a perfect knowledge in the field could not secure from unappreciated risk in the future.

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