VINEYARD ECONOMICS

Vineyards as Investments

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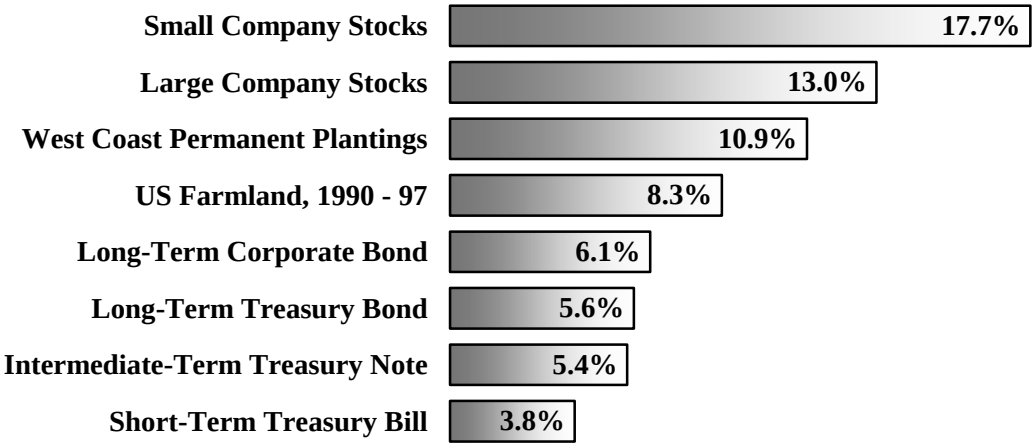
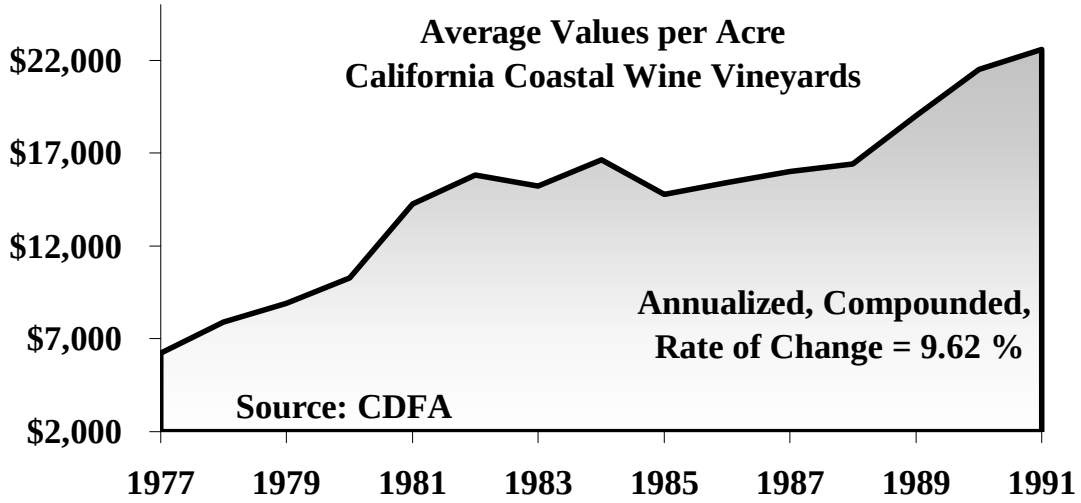
Investment objectives are usually quite simple: The highest return possible. The measure of performance for investment vehicles is typically the rate of return earned by the investment. However, rates of return, like most barometers of wealth, are complex, multi-faceted, jewels. Viewed from different perspectives, or under different light, they display shifting kaleidoscopes of brightly shining facets, some the rare jewels of true wealth, but others only transitory, temporary, illusions, ethereal fantasies which disappear with the next twist of the tube. Our objective, here, is to sort the wheat from the chaff, seeking the true jewels amongst the chimera.

Rates of return are typically related to the degree of assumed risk, so higher rates of return are accompanied by commensurate higher levels of risk. The hierarchy of risk may be illustrated by observation of total rates of return earned by differing investment vehicles over time. The highest rates, of course, are "earned" from high-risk, highly speculative vehicles, such as "junk" bonds, and/or venture capital. Excluding such speculative vehicles, we can look towards traditional equity investments in the stock market, with long-term returns on smaller capitalization stocks earning approximately 18%, almost a 5% premium over the large cap stocks, which tend to be more stable over time. The lowest levels of returns, and of risk, are seen in treasury bonds, at roughly 4 – 6%. These returns come almost entirely from income, and can be used as a benchmark for "safe" rates, with increasing risks accumulating from this point.



Investments in agricultural land, and, more specifically, in West Coast permanent plantings (vineyards and orchards) fall in the mid-range, somewhere between corporate bonds and large-cap stocks, reflecting the general perception of asset stability typically associated with land. California's premium coastal vineyards have proven to be excellent investments for those who have held such assets in recent history. A review of average vineyard values over the years prior to the airing of the "French Paradox" reveals an annualized rate of increase in value of 9.6%.



While every investment arena has its tales of woe, and stories of small fortunes made (usually, from large ones), for the most part, these assets have performed well, both in terms of income and growth. Income in recent years has proven excellent, while 1997 can only be described as spectacular. Vineyard values have also grown at stellar rates, with the true premium areas, and some emerging areas, experiencing Silicon-Valley type growth rates.

As risk is associated with unpredicted change, risk is related to the passage of time. Thus, higher risk rates (and rates of return) may be simply interpreted as accelerated recapture of the investment. A highly risky investment will demand an accelerated rate of return, as the investor will demand a quicker payback, due to the perceived level of risk. Conversely, the investor may be willing to accept a much lower rate of return on a more stable investment, over a much longer period of time, because of the perceived stability of the basic investment vehicle. A basic assumption in the total return inherent in these scenarios, however, is the implied stability of the investment principle, i.e., the investor assumes he will receive his initial investment back at the end of the period. The observed rates of return, then, imply only return "on" the investment, as we are assuming the total return "of" the investment at the end of the holding period. If we believe the investment may actually lose value during the holding period, we will want to recapture that lost value within the period. So if we feel our investment will lose half (50%) of its value within a 10 year holding period, we will want to recapture that 50% within that 10 year period, so we will require 5% per year as return "OF" our investment.

For example, we are considering the acquisition of an older vineyard, suffering from the usual nasty little buggies in the soil, and in obvious decline. After consulting with our chosen viticulturists, agronomists, vineyard managers, and various clairvoyants, we establish our basic assumptions.

We assume the vineyard production at 4.2 tons per acre for the coming year, declining at a rate of 0.4 tons per year. Cultural costs are estimated at $1,400 per acre, with harvest at $125 per ton, and overhead at $250 per acre. We believe the land underlying the vineyard has a base value of $21,000, and we are confident this land will continue, at a minimum, to hold this value for the reasonably foreseeable future.

Our friendly local winery will contract for the grapes at a contract price of $1,800 per ton, but only for three years, and we anticipate lower prices in four years. Clearly, the operation of the vineyard will not be feasible after the third year, when expenses will exceed revenues, so we must recapture the cost of the vineyard within the first three years. In addition, we desire an 11% total rate of return on our investment. Given these assumptions, our first year's operations will net $5,385. After satisfying our target rate of return of 11%, or $2,970, we have $2,415 left available for recapture, or return "of" our investment in the vineyard improvements of $6,000 (the land will continue to hold its value as at the date of our purchase). Thus, at the end of our first year, we have a remaining balance in the vineyard improvements of $3,585.

We determine we are willing to offer a price of $27,000, per acre, for the vineyard, because:

Older Vineyard Acquisition, @	**$27,000**	**per Acre**		
Year	**1**	**2**	**3**	**4**
Yield	4.20	3.80	3.40	3.00
Price/Ton	$1,800	$1,800	$1,800	$1,500
Revenue	$7,560	$6,840	$6,120	$4,500
Expenses;				
Cultural	*$1,400*	*$1,400*	*$1,400*	*$1,400*
Harvest	*$525*	*$475*	*$425*	*$375*
Overhead	*$250*	*$250*	*$250*	*$250*
Total Expenses	***$2,175***	***$2,125***	***$2,075***	***$2,025***
Net Operating Income	$5,385	$4,715	$4,045	$2,475
Target Rate of Return	$2,970	$2,704	$2,483	$2,311
Available for Recapture	$2,415	$2,011	$1,562	$164
Land Value	$21,000	$21,000	$21,000	$21,000
Vineyard Value	$6,000	$3,585	$1,574	$13
Less; Recapture	($2,415)	($2,011)	($1,562)	($164)
Remaining Vineyard Value	$3,585	$1,574	$13	($151)
Remaining Asset Value	$24,585	$22,574	$21,013	$20,849

At the end of our last year of viable operation, we have recaptured the total cost of the vineyard improvements, plus earning our target rate of return of 11%.

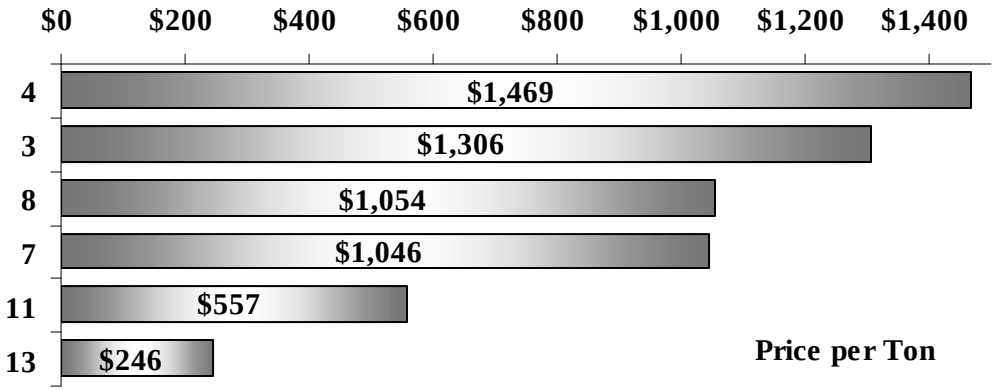
Conversely, if we view the same analysis, but use the average values indicated by the current survey, of non-resistant vines at $28,457, and $21,070 for the underlying land, we do not achieve our target rate of return, earning only 8.75% on our total investment, while recapturing the vineyard value within the first three years of operation.

We may also analyze rates of return in terms of their components, i.e., income and capital appreciation, as observed in similar investments in the marketplace. Historical actual rates of return on investment grade farmland properties across the US have averaged 8.3% over the past seven years. These rates have been generated primarily from annual income, with only 27% earned from capital appreciation of the assets. Similarly, rates on West Coast permanent planting properties have averaged just under 11%, with capital appreciation contributing only 15% to 27% of total return. Conversely, however, in "the bad years" of the late 1980's the huge losses experienced in these types of properties were driven by capital depreciation. Compared to current stock market returns, these returns are seen to be almost perfect mirrors, or inverted reflections, of stock market investment returns. Long-term total returns in large-cap stocks have generated approximately 13% rates, with over 60% of total return generated from capital appreciation.

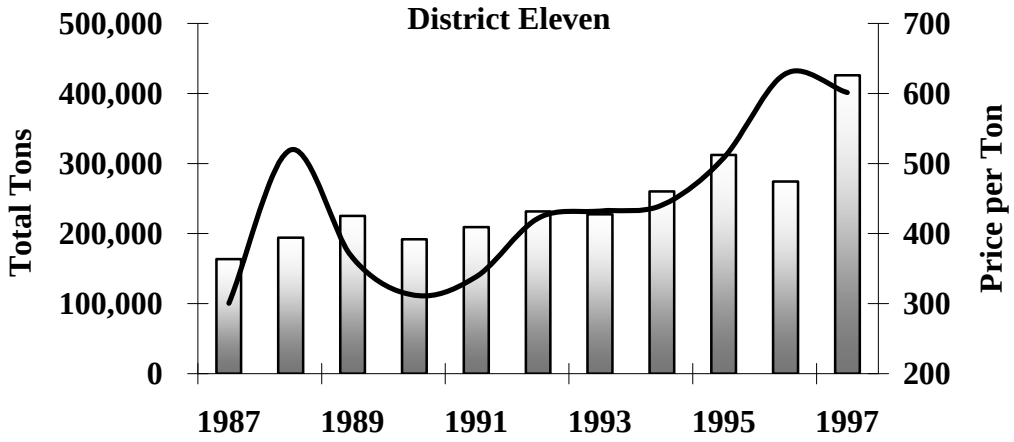
The stock returns' dependence upon capital appreciation hints at the inherent speculative nature of such investments, whereas the agricultural properties' reliance upon income underscores the market's perception of the underlying stability of asset values.

So, our perception of the stability, or conversely, the volatility, of the value of our investment will drive the rate of return we will require. Thus in areas of the highest perceived stability, e.g., Napa Valley, rates of return may be observed at much lower levels than in areas of higher volatility, which equate to higher risks.

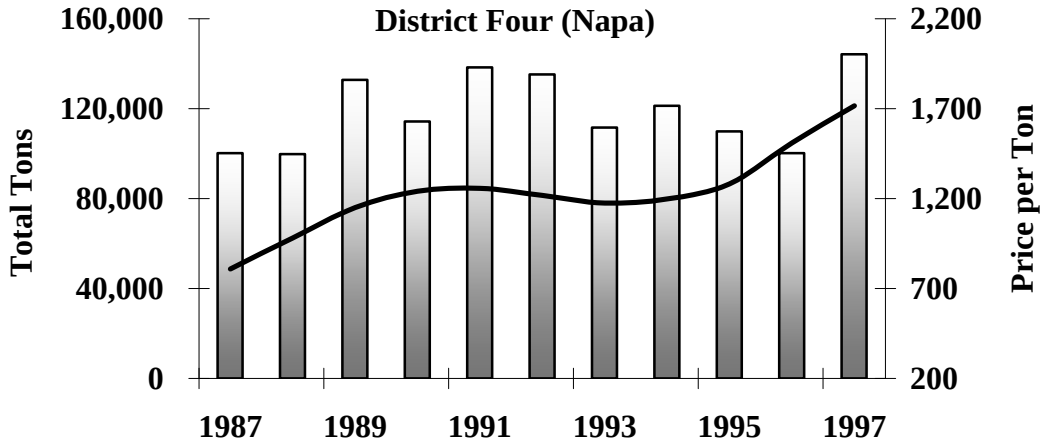
Moving to analyses of the rates generated from "typical" vineyards in the major wine growing areas of California, we see a broad spectrum of returns. The lowest rates, as we discussed, above, are seen in the areas of greatest stability, and highest demand, e.g., Napa valley, while the highest rates are observed in the "emerging markets" of the central coastal Districts 7 and 8, and the spectacularly growing Delta district Eleven. The most obvious measure of distinction between the premium districts is the average price per ton, as reported in the Grape Crush Report.



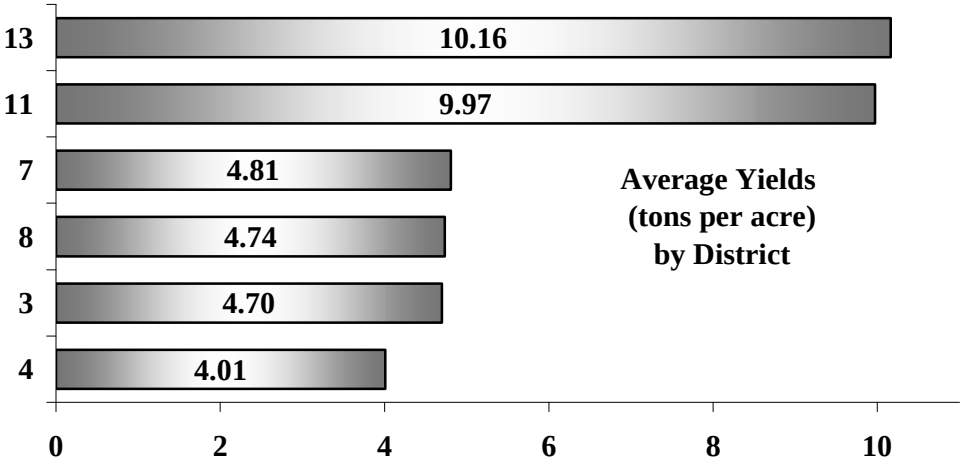
Price, however, is only one component of the total equation, only one piece of the puzzle. Volatility of price structure is a major concern, as we have all learned, painfully, over the years. Looking back at average grape prices over the past ten years, we see the greatest volatility in Districts Seven, Eight and Three, with the lowest volatility in Districts 13, 11, and Four, respectively. These lower rates may be deceptive, however, due to the lower unit prices in Districts 13 and 11. While District Four prices have run from a low of $808 to $1,716, a total increase of 112%, District 13 went from only $143 to $278, or 94%, and District 11 from only $300 to $628, or a total increase of 109%. Conversely, District Seven moved from $388 to $1,240, a total increase of 219%. Also worthy of note, here, however, is the decline in grape prices observed in District 11 in 1997, with 1997 prices 4.3% lower than 1996, as district production increased by 55%.



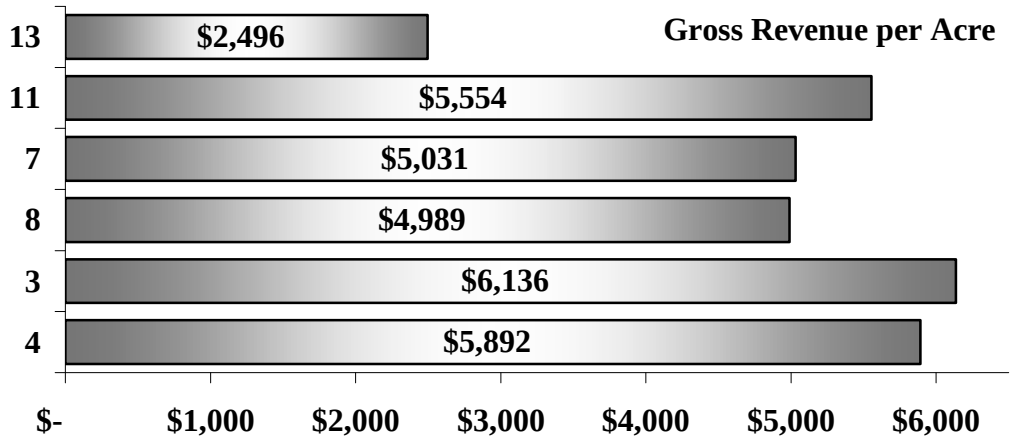
Conversely, Napa increased production by 7% as grape prices rose 10%.



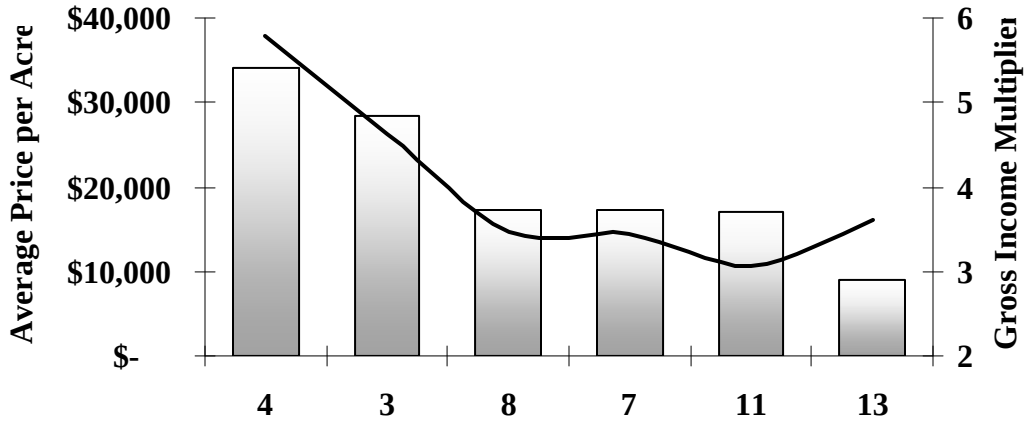
Returns are also heavily impacted by yields, the average tons of grapes produced per acre. Here again, we see a broad spectrum, with Districts 13 and 11 producing double the yields seen in the coastal areas. When reviewing such data, however, we must always keep in mind the three types of lies, lies, "damn lies", and statistics. These numbers reflect overall district averages, both old and new vineyards, and mirror the results of the massive replantings on resistant rootstock in many areas, and do not necessarily capture the true impact of new, modern style, higher density plantings, which may yield much higher tonnage than the reported district averages. In those areas which have experienced large-scale new plantings, e.g., Districts 7, 8, and 11, we may safely anticipate these new vineyards will significantly impact average yields as they achieve their full productive potential.



We now have two pieces to the puzzle, grape prices and yields. Calculating average gross revenue for each respective district, then, we see, again, a broad spectrum of numbers, an almost mirror image of the above analysis, i.e., the areas of lowest yields, Districts 3 and 4, generate the highest revenues, due to their much higher grape prices.



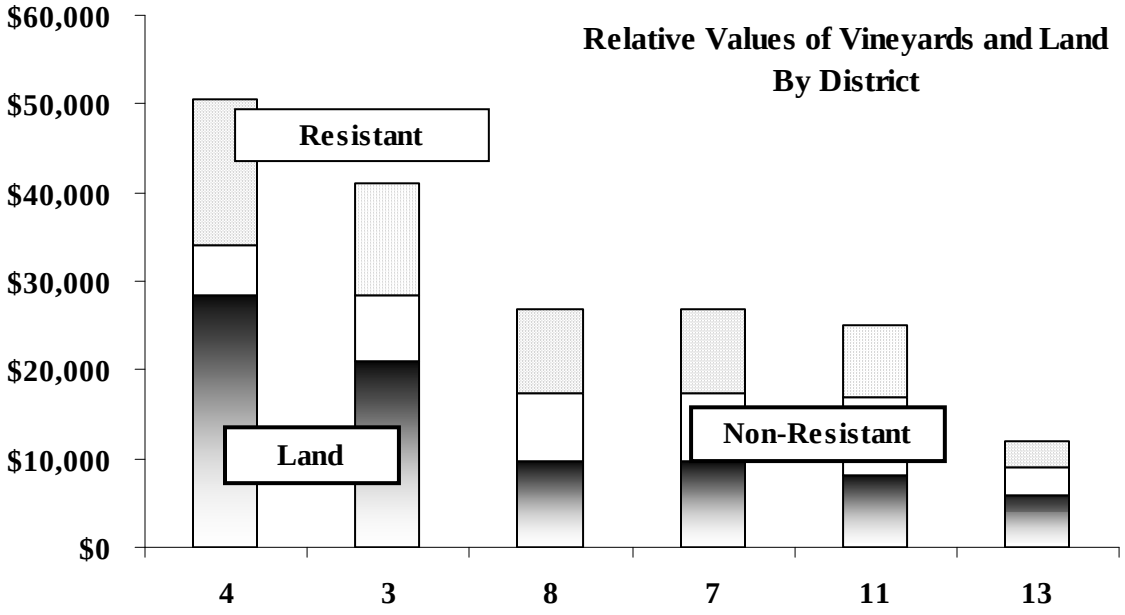
The data is, again, somewhat deceptive as District Four's averages reflect the massive replantings which have occurred there in the recent six years, with attendant loss in production as those older vineyards were removed, replanted, and gradually regained production. The newer, modern style, replanted vineyards are attaining much higher levels of production while still maintaining the high grape quality demanded by area wineries. However, these average numbers may be used effectively for comparisons between the various districts. If we then look towards the prices we would have to pay for vineyards in each of these respective areas, we can gain some insight into the multiple of revenue we can anticipate as a measure of the relative value of investments in these discrete areas. Utilizing the values indicated by this seminar's survey results for non-resistant vines, we can then calculate revenue multipliers. Once again, the market's obvious preference for Napa (District Four) is illustrated as we see the highest revenue multiplier here, at almost 6.0 (Gross Revenue of $5,892, at a vineyard price of $34,136 per acre, equates to a multiplier of 5.79 [$34,136 ÷ $5,892 = 5.79]).



While this may be a valid measure of an older vineyard, on non-resistant rootstock, we cannot use this data for modern style vineyards, with their higher levels of production, anticipated long vineyard lives, and production periods, and consequent higher vineyard prices. Again, utilizing the survey results of prices for resistant vineyards, and adjusting

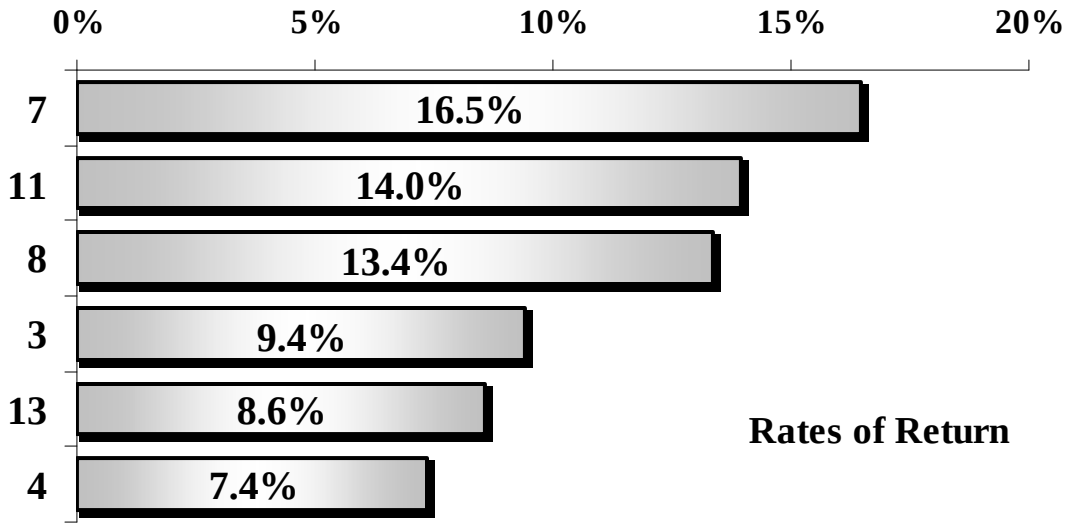
production to levels consistent with actual yields observed on such vineyards, we see a similar multiplier curve, only at slightly higher levels.

Reviewing the survey results with respect to land and vineyard values, we see trends consistent with conventional wisdom, i.e, Napa enjoys the highest values in both land and vineyards, followed closely by Sonoma, with the central coastal areas and the delta somewhat lower.



As expected, we see a smaller incremental value for the older style vineyards in Napa, as the higher land prices demand accelerated recapture and force redevelopment to modern style vineyard, which is precisely what has actually been occurring over the past ten years.

However, the true measure of vineyard performance is net operating income, with the typical measure of vineyard value the overall, direct, capitalization rate, or the ratio of income to value. The various regions demand differing costs of production, resulting in various respective net incomes. Following our previous analysis, we will look first at traditional, older style vineyards on non-resistant rootstock. Some regions may gain performance in this analysis, with lower costs, but the overall pattern is familiar, Napa yields the lowest rates of return, with the highest rates seen in the emerging areas of Districts 7 and 11.



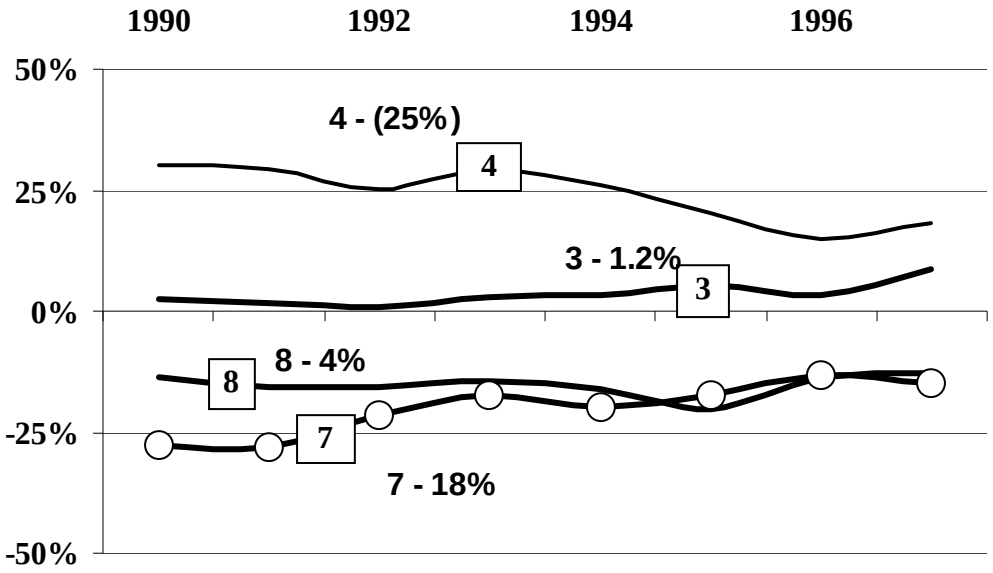
Moving to the newer, modern style, vineyards on resistant stock, we see a slightly different pattern of returns, but with Napa still holding the line at the lowest rate, and the highest rates still observed in the central coastal districts, 7 and 8.

District Seven, Monterey and San Benito Counties, continues to hold the high point of the range. This district is unique in several regards, first, the premiere grape growing areas of this district have not shared in the general growth of demand for coastal homesites, or other alternative non-agricultural uses. In the dominant grape growing area, the Salinas valley, vineyards compete for land with the opposing dominant ag use, vegetables, but this competition is based on an inverse relationship; e.g., while demand for, and values of, vegetable land increase as one moves north within the Salinas valley, the demand for, and value of, land for vineyard moves in an inverse trend, gaining demand and price levels as one moves farther south in the valley. This trend, and market opposition, is a result of the unique climatography of the Salinas valley, a classic illustration of a thermal siphon, drawing the cool marine air up into the sun-drenched interior of the valley, creating multitudinous micro-, and meso-, climates, within the interior reaches of the valley.

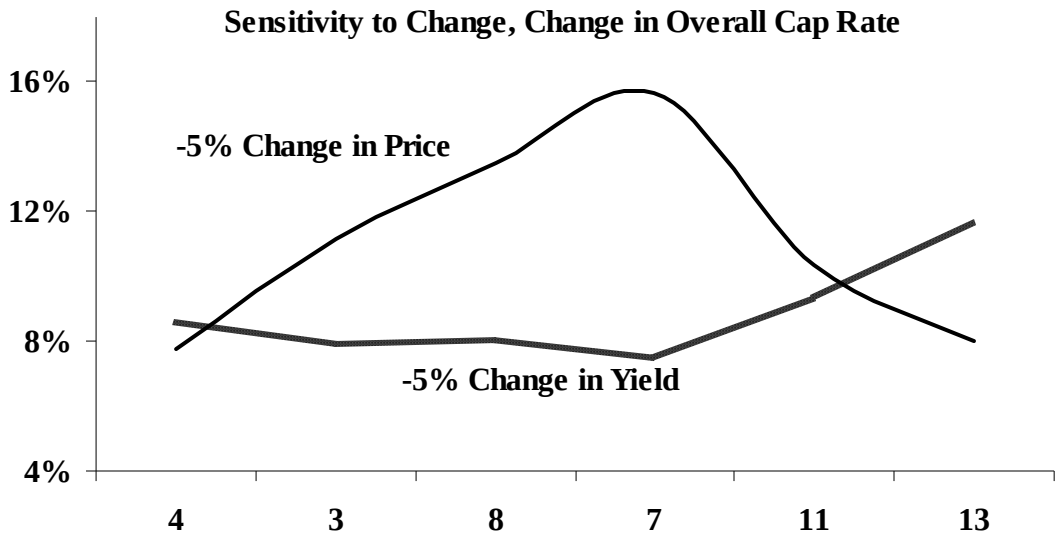
While this area has already experienced its own brushes with the economic reality of wine grape production, local vignerons have learned much about which varieties may be grown where, and wineries have responded positively to the production of new vineyards, founded in the experience of the past few decades.

District Eight also represents the results of a long, painful, learning curve, as area growers have slowly defined the proper varieties in their respective locations, and have slowly fine-tuned the production of premium varieties. District Eight, however, is distinguished from Seven in light of the significant demand for alternative uses, with homesite and other non-ag uses impacting local land markets significantly.

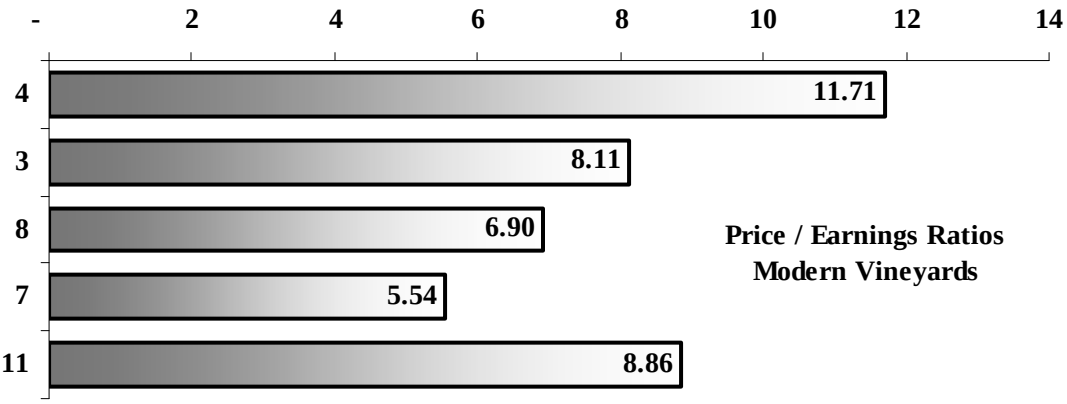
We may also view historical grape prices in relative terms, i.e., how they move in relation to each other, or to an index composed of the weighted average prices of the premium areas. If we develop such an index for the major coastal premium areas of Districts, 3, 4, 7 and 8, and view each district's prices relative to this index, we see the index rising, with District Four (Napa) actually declining in relative terms, while 3, 8 and 7 are increasing, again, in relative terms, with respect to the index (0%).



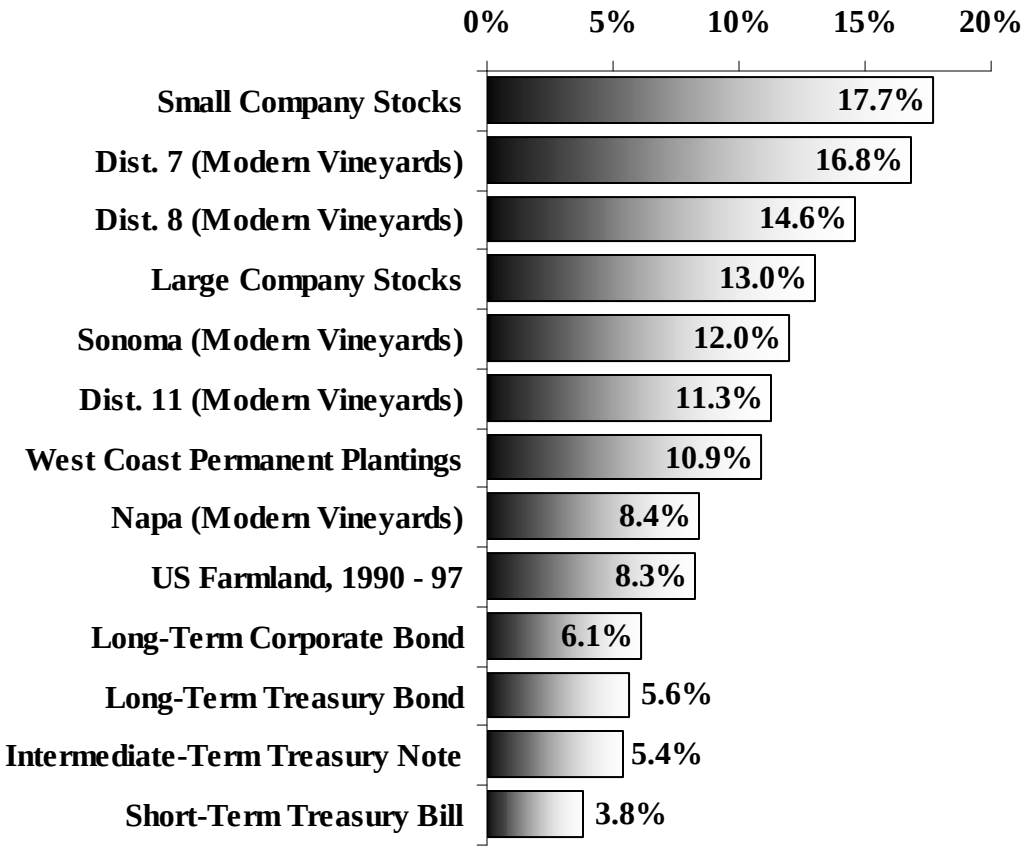
Districts Seven and Eight also stand out in the analysis of sensitivity to change. Looking at changes in grape prices, a negative change of five percent (5%) in grape prices creates an average change in capitalization rates of 9%, with Districts 7, 3, and 8 reflecting the lowest rates of change, with the highest levels seen in Districts 11 and 13. Conversely, Districts 3, 8 and 7 are most sensitive to changes in per-acre yields.



We may also view this data from a slightly different perspective, using the stock market's benchmark measure of price/earnings (P/E) ratio. The P/E is nothing more than the inverse of the capitalization rates, thus a cap rate of 18% translates to a P/E of 5.54, surely not up to Netscape standards. Reviewing the data for the various districts, we see the obvious mirror image of the trend presented directly above.



With all this information in hand, we may revisit our hierarchy of risk and return analysis. Reviewing rates for modern vineyards, the scale of returns now reads as follows;



So, where does all this lead us? We have determined the areas of lowest rates of return, which may (or may not) imply the lowest degree of risk, and we have defined those areas with the highest rates of return, which, again, may (or may not) imply the highest levels of risk. At the very least, I trust we have gained a greater understanding of the concept of "rate of return" and the commensurate levels of risk associated with those rates. As we explore investment in the respective premium grape growing areas of California, we may use this knowledge to better understand, and quantify, the risks, and returns, available in such investments.

Vintage Values
A Vineyard Investment Portfolio

We have been "given" a sizable cash account, to invest in California vineyards. The investments are to be limited to direct equity, with no leveraging, or "gearing" to multiply the impact of the cash equity funds. Any required redevelopment, or other capital expenditures, must either be funded from operating profits, or be allocated going into the respective investments, i.e., no additional funds will be available in the future. Investment vehicles are limited to wine grape vineyards in California.

So where do we go to spend our bag of cash? Clearly, a significant portion will be earmarked for investment opportunities in Napa County, as the true "blue chip" account. Why do we consider Napa a "blue chip" opportunity? Reviewing the risk/return analyses presented, Napa investments appear to generate the lowest level of returns observed in our overview of the premium growing areas of California's coast. These returns, however, are low because of the low level of risk perceived by investors in this market. And, in fact, Napa continues to be an extraordinarily stable market, with land and vineyard values climbing steadily over the years, albeit with the usual, occasional, hiccup. Napa has clearly emerged as a world-class premiere wine growing area, and, in comparison to other such world-class sites, even the extraordinarily high vineyard values observed today may, indeed, yet be seen to be bargains as we enter the twenty-first century. The stability of this market is amplified by the demand for alternative uses, with homesite values adding significant incremental value. The severe geographic constraints of this area sharply limit the supply of available land, and demand is further enhanced by the physical location proximate to the bay area urban centers, and the valley's considerable aesthetic attractions.

As Napa wines continue to gain global stature, these values can be expected to, at a minimum, hold, and, perhaps, gain, slowly, as world demand for luxury level wines continues to grow, as the areas capable of growing such wines remain severely constrained. The premiere appellations within Napa valley continue to gain global stature as the wines produced from these grapes continue to shine in the harsh, unforgiving, light of global level competition.

Proximity to the bay area urban centers, and aesthetics, are not exclusive to Napa, however, and just over the hills, Sonoma County beckons. Sonoma shares much of the support for land values as Napa, as homesites and non-ag uses continue to compete with vineyards. Sonoma's many appellations are continually gaining recognition for high quality wines at good value, although vineyard and land values still reflect a significant increment of value less than Napa. Sonoma's vignerons must still deal with the replanting of many thousands of acres to resistant rootstock, and this extensive endeavor may provide targets of opportunity for clever investors such as we. Redevelopment of older vineyards, however, must be approached cautiously, as these projects can consume cash quickly, and many folks are reluctant to bite the bullet and call in the bulldozers when

grape prices are as high as they are today. But is it wiser to wait, as the older vines decline, and yields taper off into negative cash flows?

Our next target would be the Central Coast, specifically such defined areas as Arroyo Seco, the Santa Lucia Highlands, Paso Robles, and the cooler climes of Santa Maria and Santa Ynez. Many of the more southern areas on this coast also experience significant non-ag forces impacting land values.

The final area for our endeavor would be the Delta, the Lodi-Woodbridge area which is doing such a great job of raising consumer awareness of their sense of place, and which is capable of such amazing production levels.

All of these areas, of course, are the focus of intense competition for land and vineyard properties, and our investment objectives will demand a tightly focused effort at identifying, and acquiring, those jewels of opportunity which we know are always out there in the dust.