INTRODUCTION

Non-Technical Presentation
"Grape Capital – Wine Investment Thesis"

Presenter: Bart Teeuwen
Date: February 14th, 2021

Agenda

- Problem Summary

- Key insights & recommendations

- Wine industry analysis
  - Wine variables
  - Wine quality
  - Wine ratings
  - Wine varieties
  - Wine countries
  - Wine price & points
  - Wine climate
  - Wine climate prediction

- Recap

- Winery investments

- Q&A

Problem Summary

1. Grape Capital

- Venture capital firm investing in high growth industries
- Witnessed high growth in wine industry
- Looking to acquire a stake in this industry
- Initial investment of $10M in wineries in next 5 years with 20% ROI

2. Problem

- No previous knowledge of wine industry
  - Wine quality
  - Wineries
  - Wine climate
  - Wine countries

3. Project

- Research wine industry:
  - Wine quality understanding
  - Wine ratings, points, and price foundation
  - Wine varieties & country locations
  - Effect of climate change

- Recommendations for which wineries to invest in based on thorough data analysis

Key Insights & Recommendations

Recommendations

- Split the $10M in two investment groups of short and long-term investments:
  - Short-term – Invest 70% in four wineries based in the US and Portugal between 2021 and 2025
  - Long-term – Invest 30% in three wineries based in Argentina, Spain, and Australia
- Advise wineries of nuances in wine variety preferences for red/white wine to help better market wines
- Consider creating another investment fund if wineries perform above expectation

Key learnings

- Creating high quality red and white wine requires a delicate balance of variables, with alcohol as the main driver
- American wines have more ratings and a lower price points than French wines, which stand out with a high average price
- Wine varieties produced in small regions in a complex climate tends to differ by country and has a higher average price point
- Red wine varieties seemed more popular than white wines based on wine ratings
- Most wineries are in the US followed by France and Italy. Other EU countries are up and coming
- The top 3 winery locations also score most wine review points followed by Mediterranean countries
- Average wine price does not seem to correlate to a higher average point score with wine reviews
- Typically, countries with a Mediterranean climate are a better choice to operate wineries
- Countries not known as a wine country are hosting more wineries, which could prove to become an opportunity eventually
- Europe is well suited for producing wine based on average temperature
- The average climate temperature is set to reach 20 degrees Celsius by 2025, which may provide some countries with a better climate to produce wine while other countries climate could become disadvantageous

Problem

- Grape Capital invests in high growth industries but has observed a large growth in the wine industry
- The company wants a piece of the pie and plans on investing $10M in wineries that it thinks can generate an ROI of 20%
- Grape Capital doesn't have extensive knowledge about the global wine industry and which wineries are successful
- A data analyst is hired to perform data analyses across four datasets: wine quality (1), wineries (2), wine countries (3), and climate change (4)
- The goal is to make recommendation for which wineries Grape Capital should invest its money to achieve it's ROI
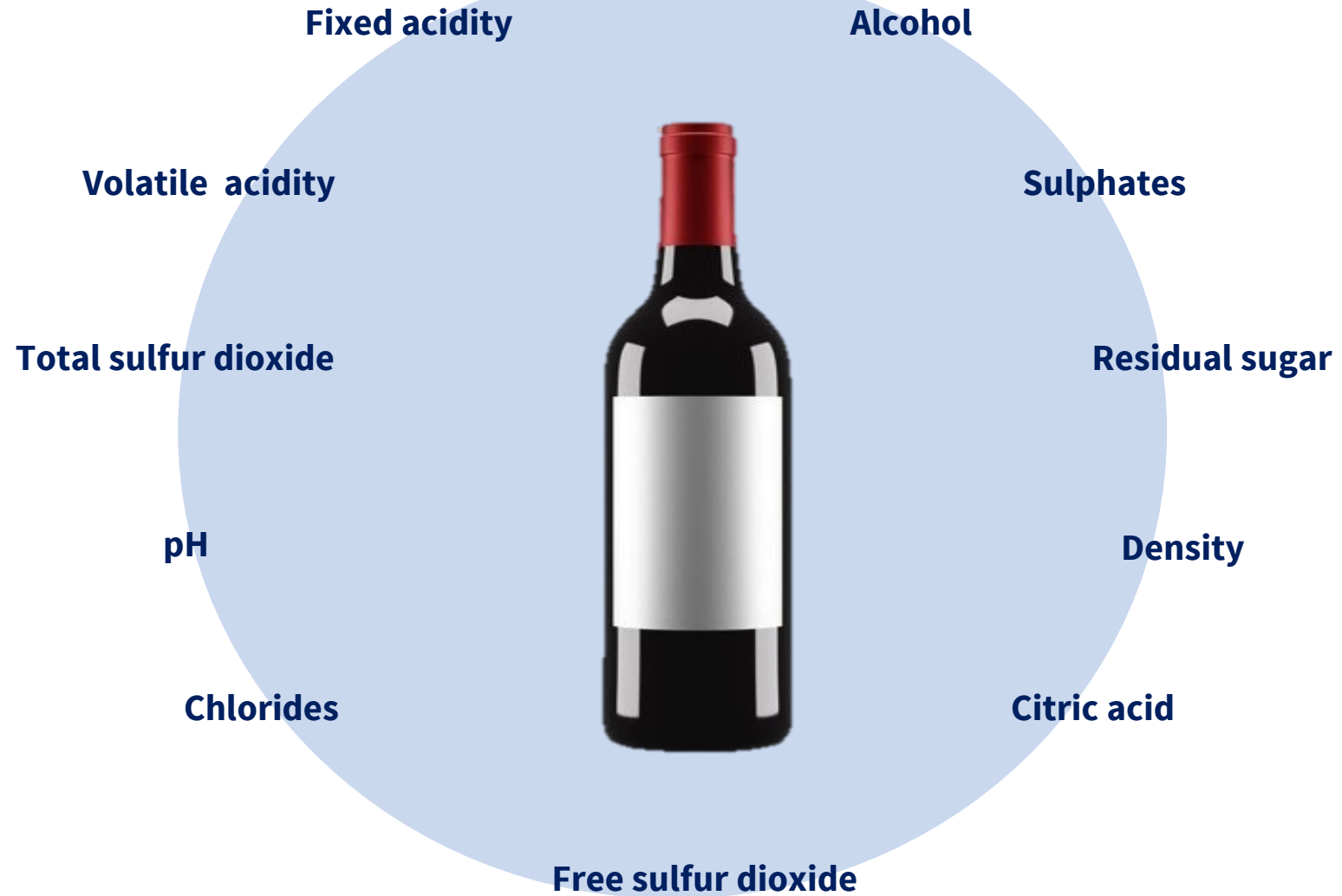
Wine industry analysis

1. Wine variables

2. Wine quality

3. Wine countries

4. Wine ratings

5. Wine varieties

6. Wine price & points

7. Wine climate

8. Wine climate prediction

Wine variables– There are eleven variables that together make a wine, with its delicate balance determining the level of quality

This balance is different for both red and white wine varieties

Fixed acidity

Alcohol

Volatile acidity

Sulphates

Total sulfur dioxide

Residual sugar

pH

Density

Chlorides

Citric acid

Free sulfur dioxide

Wine Quality – Data shows density has a positive relationship while volatile acidity and chlorides have a negative relationship to wine quality

1. Wine variables significant to quality

Strong		Volatile acidity	Fixed acidity	Total sulfur dioxide	Free sulfur dioxide
Weak	Alcohol	pH	Sulphates	Residual sugar	Density	Citric acid	Chlorides

2. Influence of strong significance

Volatile acidity	Density	Chlorides
Negative relationship with wine quality	Positive relationship with wine quality	Negative relationship with wine quality

3. What this means

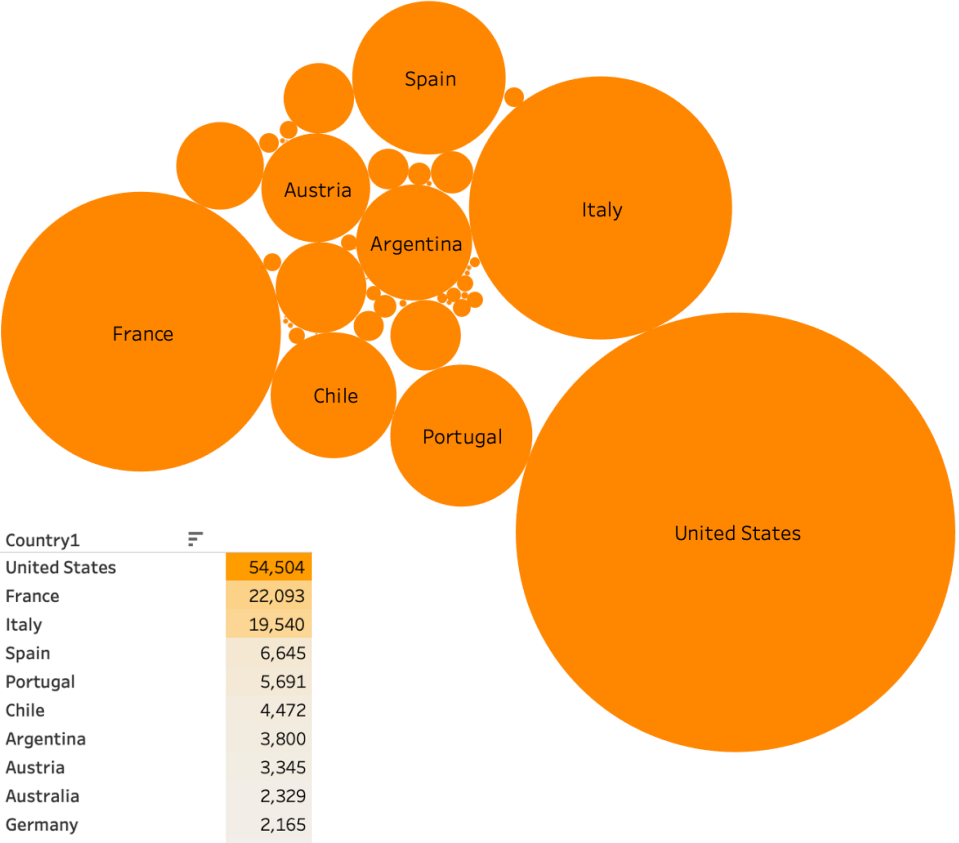|		
More results in a lower wine quality	More results in a higher wine quality	More results in a lower wine quality

Wine Countries – The United States, France, and Italy host most wineries and points globally

Wine Countries

- The United States, France, and Italy are the top 3 winery destinations
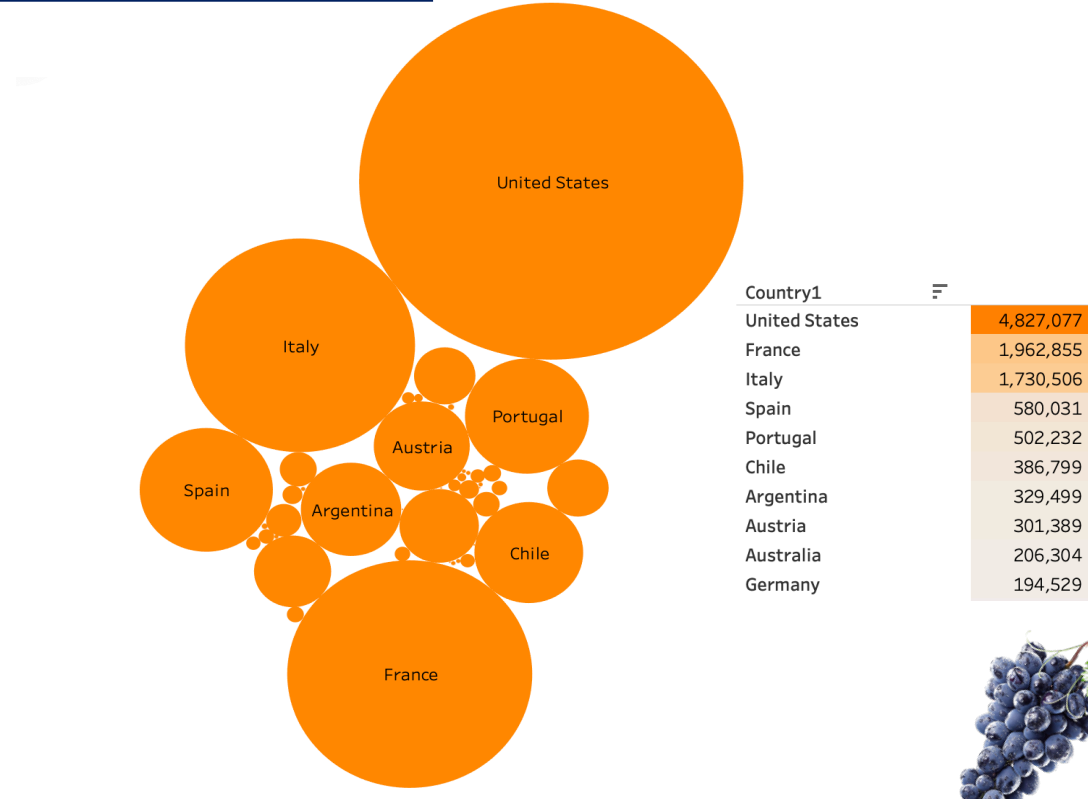- The US has more than double the number of wineries France has

Countries with Most Wineries

Country1	
United States	54,504
France	22,093
Italy	19,540
Spain	6,645
Portugal	5,691
Chile	4,472
Argentina	3,800
Austria	3,345
Australia	2,329
Germany	2,165

Wine Points

- The United States, France, and Italy scored the most wine points
- Mediterranean countries seem to pick up in points
- The US has almost 2.5X more points than France

Countries with most Points

Country1	
United States	4,827,077
France	1,962,855
Italy	1,730,506
Spain	580,031
Portugal	502,232
Chile	386,799
Argentina	329,499
Austria	301,389
Australia	206,304
Germany	194,529

Wine Ratings – The top 15 wineries all have 100+ reviews but cost less than $135 avg while the top 15 most expensive wineries have <30 reviews

Winery Reviews

- The United States has a lot of wineries that have a lot of reviews compared to other countries
- France still maintains its presence as a large wine country

Wineries with Most Reviews

Winery1	Country1	
Wines & Winemakers	Portugal	222
Testarossa	United States	218
DFJ Vinhos	Portugal	215
Williams Selyem	United States	211
Louis Latour	France	199
Georges Duboeuf	France	196
Chateau Ste. Michelle	United States	194
Concha y Toro	Chile	164
Columbia Crest	United States	159
Kendall-Jackson	United States	130
Siduri	United States	126
Gary Farrell	United States	125
Lynmar	United States	118
Montes	Chile	117
Albert Bichot	France	117

Winery avg Prices

- 93% of the top 15 most expensive wineries by avg price is France
- Each of the top 15 wineries has less than 30 reviews overall
- Wineries with the most reviews cost on avg cost less than $135 a bottle

Wineries with Highest AVG Price

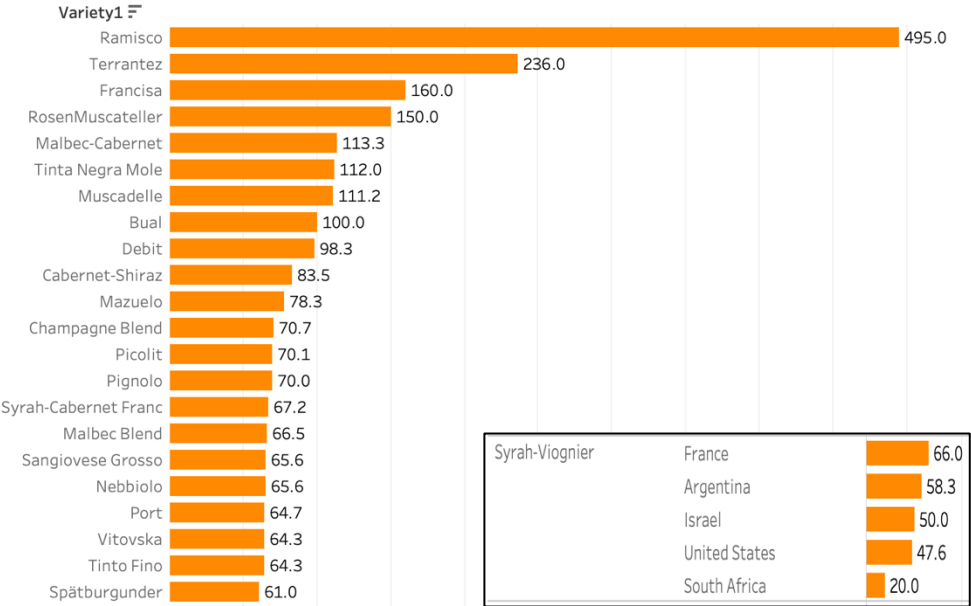| Winery1	Country1	
Château les Ormes Sorbet	France	3,300
Château Pétrus	France	2,250
Domaine du Comte Liger-Belair	France	1,489
Château Cheval Blanc	France	825
Château d'Yquem	France	800
Masseto	Italy	588
Château Laville Haut-Brion	France	580
Château Haut-Brion	France	572
Château La Mission Haut-Brion	France	546
Château d'Ausone	France	507
Château Mouton Rothschild	France	479
Château Lafite Rothschild	France	473
Armand de Brignac	France	469
Château Margaux	France	448
Château Latour	France	437

Wine Varieties – The most popular wine varieties are red wines, and there seems to be a large price difference by wine variety due to scarcity

Wine Varieties & Avg Price

- Ramisco, Terrantez, and RosenMuscateller have the highest avg price (rare Portugese/Australian grapes)
- Wine varieties range in price by geography

Wine Varieties with High Price

Variety1	
Ramisco	495.0
Terrantez	236.0
Francisa	160.0
RosenMuscateller	150.0
Malbec-Cabernet	113.3
Tinta Negra Mole	112.0
Muscadelle	111.2
Bual	100.0
Debit	98.3
Cabernet-Shiraz	83.5
Mazuelo	78.3
Champagne Blend	70.7
Picolit	70.1
Pignolo	70.0
Syrah-Cabernet Franc	67.2
Malbec Blend	66.5
Sangiovese Grosso	65.6
Nebbiolo	65.6
Port	64.7
Vitovska	64.3
Tinto Fino	64.3
Spätburgunder	61.0

Syrah-Viognier		
	France	66.0
	Argentina	58.3
	Israel	50.0
	United States	47.6
	South Africa	20.0

Wine Varieties

- Pinot Noir, Chardonnay, Cabernet Sauvignon, Red Blend, and Bordeaux-Style Red Blends are the popular wine varieties
- Red wine varieties seem to be more popular than white wine varieties

Most Popular Wine Varieties

Variety1	
Pinot Noir	13,272
Chardonnay	11,753
Cabernet Sauvignon	9,472
Red Blend	8,946
Bordeaux-style Red Blend	6,915
Riesling	5,189
Sauvignon Blanc	4,968
Syrah	4,142
Rosè	3,564
Merlot	3,102
Nebbiolo	2,804
Zinfandel	2,714
Sangiovese	2,707
Malbec	2,652
Portuguese Red	2,466

Wine Price & Points Comparison – A higher wine price does not ensure higher point reviews by (experienced) tasters

Rating Count & Points by Taster

- Roger Voss, Michael Schachner, and Kerin O'Keefe gave out the most wine ratings from all tasters
- Roger Voss gave 1.7X more wine ratings than the 2nd closest taster in terms of wine ratings

Wine Rating Count and Points by Taster

Taster Name	Count of Wine ratings	Points
Roger Voss	25,514	2,263,296
Michael Schachner	15,134	1,315,258
Kerin O,ÄôKeefe	10,776	957,641
Virginie Boone	9,537	850,828
Paul Gregutt	9,532	849,135
Matt Kettmann	6,332	569,935
Joe Czerwinski	5,147	455,696
Sean P. Sullivan	4,966	440,761
Anna Lee C. Iijima	4,415	390,355
Jim Gordon	4,177	370,192
Anne Krebiehl¬†MW	3,685	333,723
Lauren Buzzeo	1,835	161,002
SUnited Statesan Kostrze..	1,085	93,971
Mike DeSimone	514	45,798
Jeff Jenssen	491	43,365
Alexander Peartree	415	35,630
Carrie Dykes	139	12,009
Fiona Adams	27	2,346
Christina Pickard	6	527

Comparing avg Rating Points With avg Price & Reviews

- A higher price does not have more review points
- On average, Anne Krebiehl has given the most points for wine reviews while Virginie Boone review most expensive wines on average
- Michael Schachner and Roger Voss have reviewed most wines from all tasters

Average Points & Price per Wine Review by Taster

| Taster Name	Avg. Points	Avg. Price	Count..
Roger Voss	89	39	25,514
Michael Schachner	87	25	15,134
Kerin O,ÄôKeefe	89	42	10,776
Virginie Boone	89	47	9,537
Paul Gregutt	89	34	9,532
Matt Kettmann	90	39	6,332
Joe Czerwinski	89	35	5,147
Sean P. Sullivan	89	34	4,966
Anna Lee C. Iijima	88	30	4,415
Jim Gordon	89	27	4,177
Anne Krebiehl¬†MW	91	31	3,685
Lauren Buzzeo	88	24	1,835
SUnited Statesan Kostrze..	87	23	1,085
Mike DeSimone	89	28	514
Jeff Jenssen	88	22	491
Alexander Peartree	86	29	415
Carrie Dykes	86	31	139
Fiona Adams	87	31	27
Christina Pickard	88	29	6

Wine Climate – Countries in Africa and South America have a better wine climate despite more wines coming from moderate climates

Country Climate

- The AVG temperature differs by country but follows the general equator climate zones

Countries and AVG Temperature
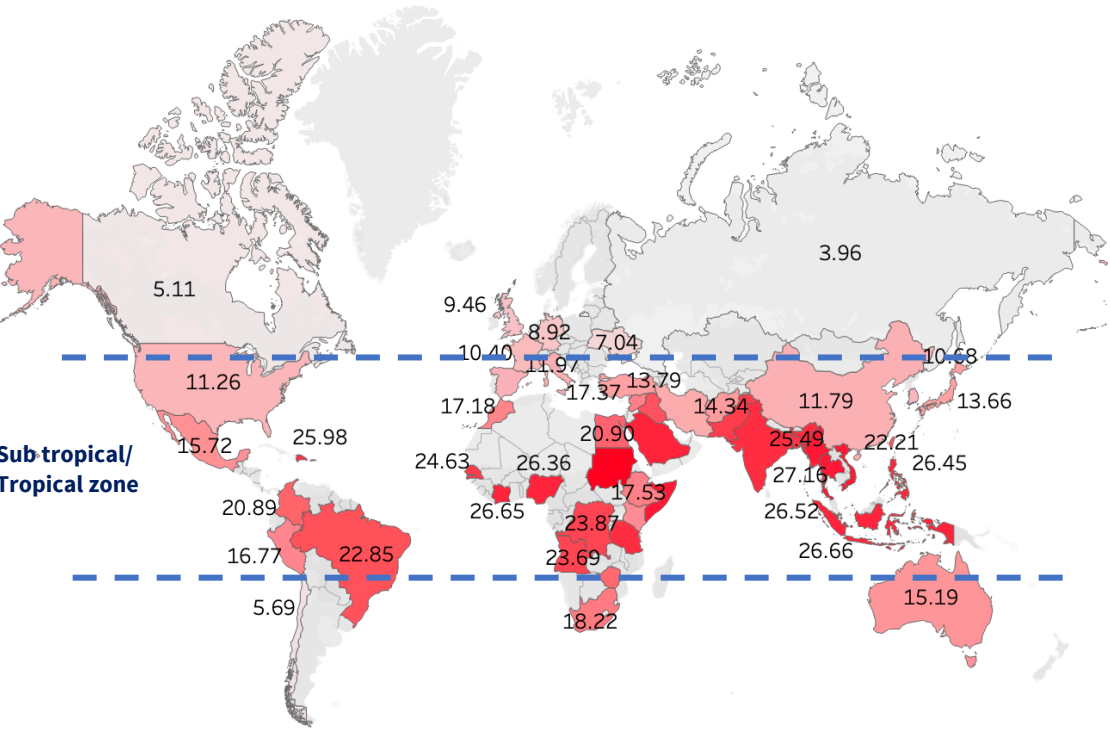
Country Climate Filter

- Filter list of countries with AVG temperatures to match countries from the wine ratings dataset

Country Climate Filter

Ideal Country Climate

- India, Brazil, and Egypt are the top 3 countries based on AVG temperature
- Europe has most countries with ideal climate

AVG Temperature by Country

Country1		Continents	Rank	Score
India	25.81	Asia	Europe	7
Brazil	22.85	South America	South America	3
Egypt	20.90	Africa	Africa	3
South Africa	18.22	Africa	North America	3
Morocco	17.18	Africa	Asia	2
Peru	16.77	South America	Oceania	1
Mexico	15.72	North America		
Australia	15.19	Oceania		
Turkey	13.79	Europe		
Italy	11.97	Europe		
China	11.79	Asia		
Spain	11.45	Europe		
United States	11.26	North America		
France	10.40	Europe		
United Kingdom	9.46	Europe		
Germany	8.92	Europe		
Ukraine	7.04	Europe		
Chile	5.69	South America		
Canada	5.11	North America		

Sub tropical/ Tropical zone

The ideal wine climate is between 10 and 27 degrees Celsius

Wine climate prediction – Globally the average temperature is set to rise 0.15 degrees Celsius by 2025

Recap

So far, we've discussed the following:

- *Problem summary*
- *Key insights & recommendations*
- *Wine industry analysis*

> Investment recommendations

Winery Investments – Grape Capital should consider investing 70% of funding in four wineries based in the US and Portugal short-term, and 30% of funding in three wineries based in Argentina, Spain, and Australia long-term

	Country	Winery	Variety	Investment
Short Term 2021-2025	United States	Testarossa Williams Selyem Chateau Ste. Michelle	Pinot Noir Chardonnay Zinfandel White Riesling	$6M
	Portugal	Wines & Winemakers	Portugese Red Touriga Nacional	$1M
Long Term 2025-2030	Argentina	Trapiche (AR)	Shira- Viognier Malbec	$1M
	Spain	CVNE (ES)	Tempranillo Tempranillo Blend	$1M
	Australia	D' Arenberg (AUS)	Shiraz Riesling	$1M
ROI	**5 countries**	**7 wineries**	**12 varieties**	**$200K** (20% * $10M)

Q&A

Image Sources

Slide 1: source 1

Slide 2: source 2

Slide 5 and 14: source 3

Slide 6: source 4

Slide 6: source 5

Slide 16: source 7

All slides' grapes: source 8

Dataset Limitations & Assumptions

Dataset 1 – Wine Quality for red and white wine:

This datasets is related to red and white variants of the Portuguese "Vinho Verde" wine and is part of the UCI machine learning repository (UCI, 2015). The data was collected from May 2004 to February 2007, included 4898 wine samples for each wine variant, and was evaluated by a minimum of three sensory assessors through blind tastings. Each tasting was given a score on a scale that ranges from 0 to 10, that matches to very bad to excellent quality, respectively (white wine scores ranged between 3 and 9).

Dataset 2 – Wine ratings:

The dataset is pretty large with 150K rows and contains 10 columns of wine reviews scraped from WineEnthusiast during June of 2017. Each record in the dataset represents a single wine review from an online user of Wine Enthusiast Magazine.

Dataset 3 – Climate temperature

This dataset was put together by Berkeley Earth for their Berkeley Earth Surface Temperature Study. It combines 1.6 billion temperature reports from 16 pre-existing archives.

Assumptions

- Wine quality data was assumed to be general for the entire white and red wines available
- Wine reviews from 2017 are assumed to have stayed consistent in quality as to warrant the investment recommendations
- Climate temperature data from countries did not match most of the countries listed in the wine rating dataset. The wine rating dataset was chosen as the main dataset feeding into the recommendations
- The climate temperature dataset with bigger list of countries was primarily used to showcase and predict the average temperature changes over time and matched to countries from wine ratings dataset
- ROI is a projection and may not be generated by the projected date as mentioned