INTRODUCTION

Executive Presentation
"Grape Capital – Wine Investment Thesis"

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Date: February 15th, 2021

Agenda

- Key insights & recommendations
- Problem summary
- Wine analysis
  - Wine quality
  - Wine ratings
  - Wine varieties
  - Wine countries
  - Wine price & points
  - Wine climate
  - Wine climate prediction
- Recap
- Winery investments
- Q&A

Problem Summary

The client

- Grape Capital
- VC firm investing in high growth industries
- Looking to acquire a stake in wine industry
- Capital fund of $10M in wineries in next 5 years with 20% ROI

The problem

- Lack of wine knowledge in areas:
  - Quality of wine
  - Wineries
  - Wine countries
  - Effect of climate change

The 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 density 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
- A higher wine price does not ensure higher point reviews by (experienced) tasters
- 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

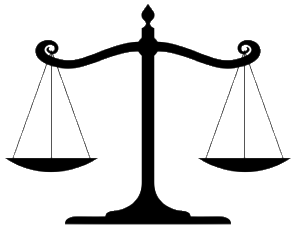
- Grape Capital wants to invest $10M in wineries that it thinks can generate an ROI of 20%
- Grape Capital doesn't have extensive knowledge about the global wine industry and which wineries are successful
- A data analyst is hired to perform data analyses across three datasets: wine quality (1), wine ratings (2), and climate change (3)
- The goal is to make recommendation for which wineries Grape Capital should invest its money to achieve it's ROI

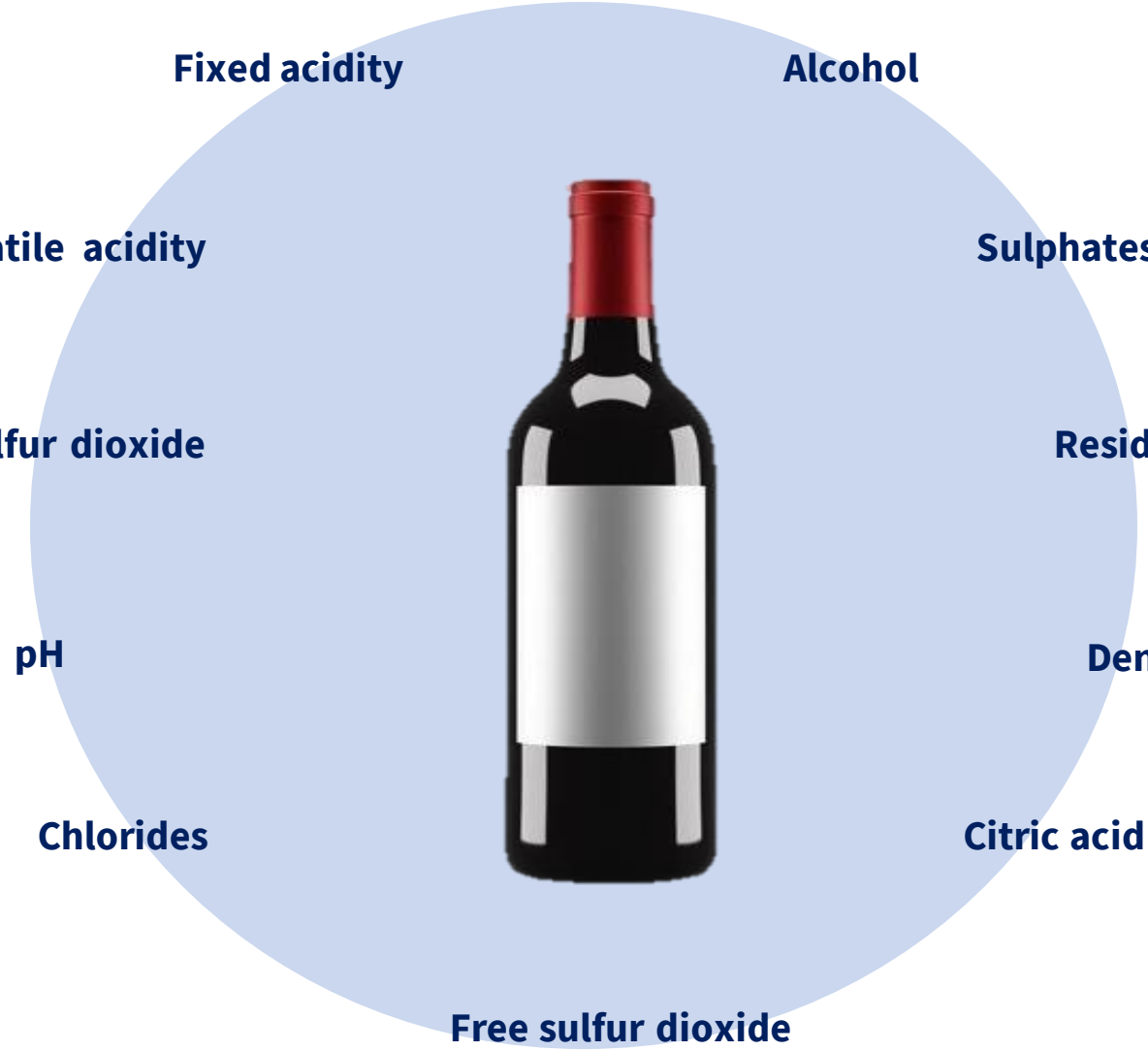
Wine industry analysis

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





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 (P- value >0.05) **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

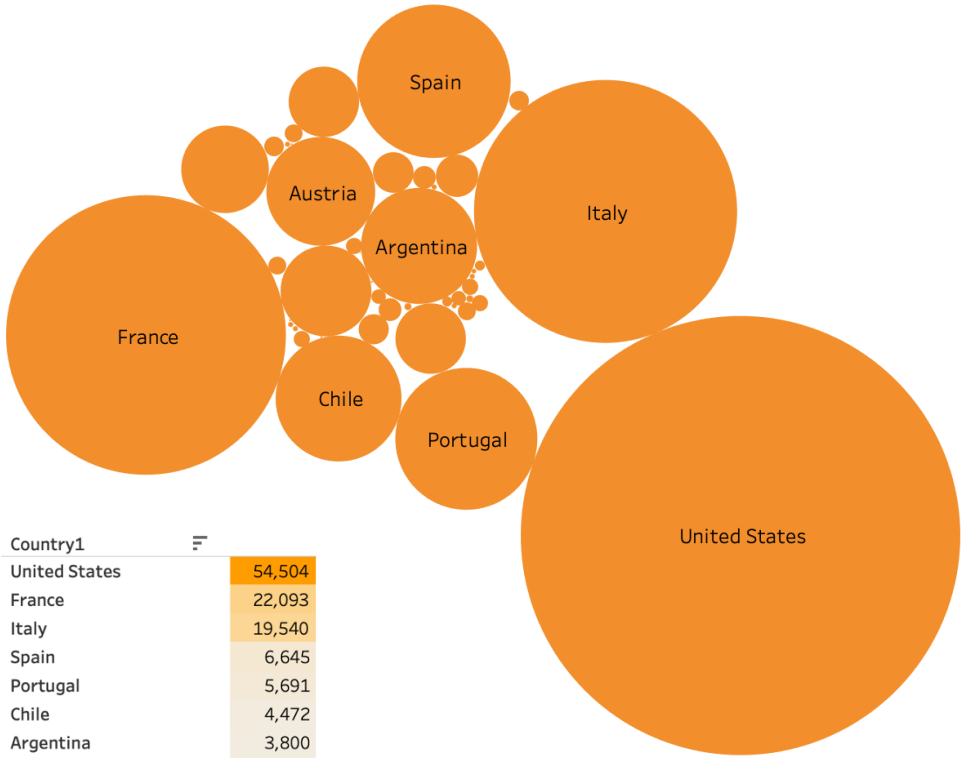
This data can be used by Grape Capital to advise wineries in their production process to increase the quality of their wine

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
- Other European countries are increasing the number of wineries

Countries with Most Wineries

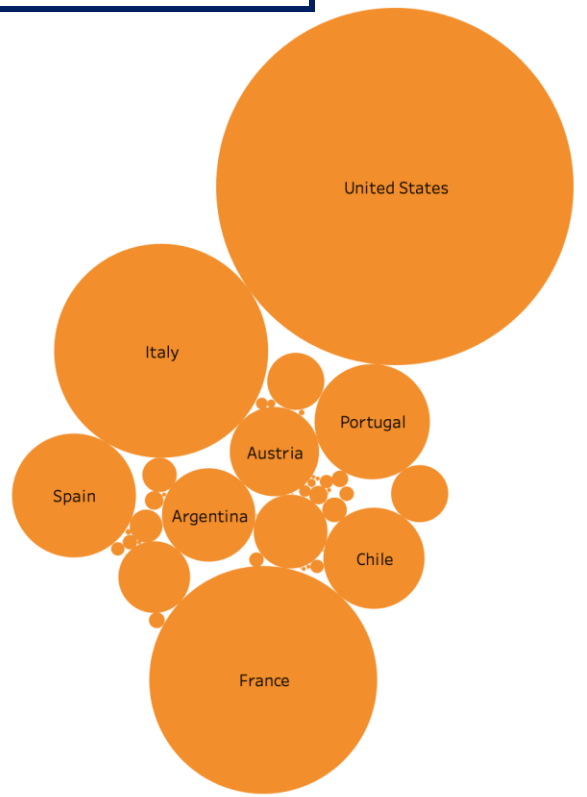


Country1	
United States	54,504
France	22,093
Italy	19,540
Spain	6,645
Portugal	5,691
Chile	4,472
Argentina	3,800
Austria	3,345
Australia	2,329
Germany	2,165

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

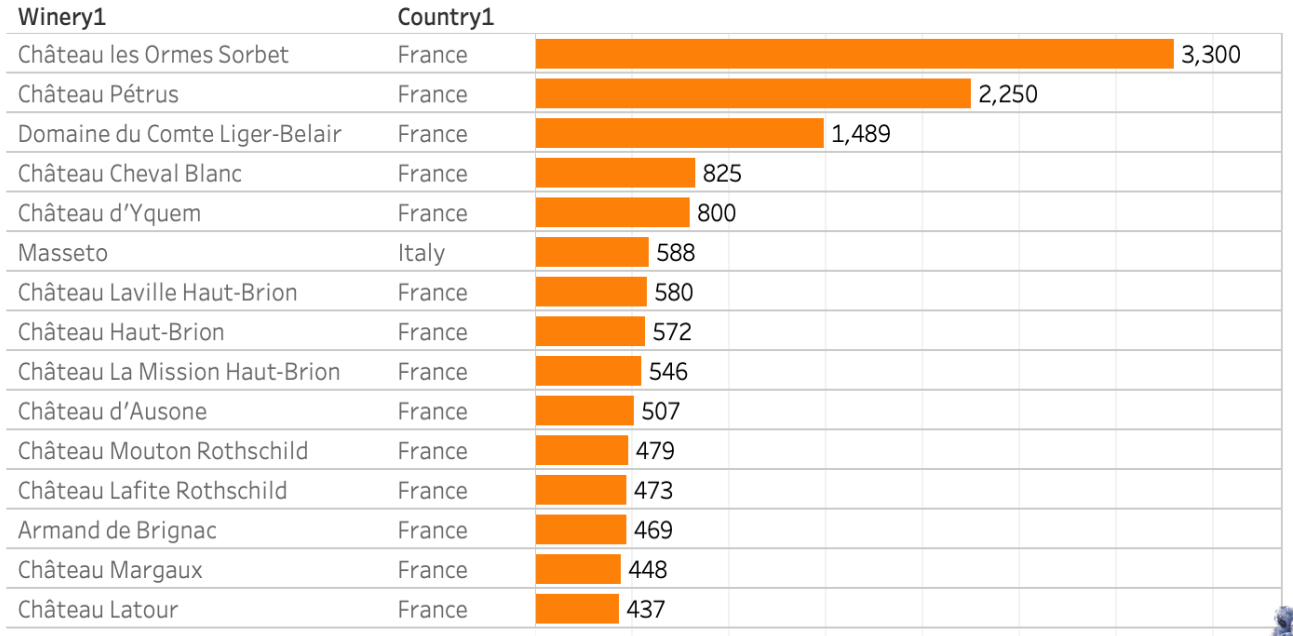
Wineries with Most Reviews

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

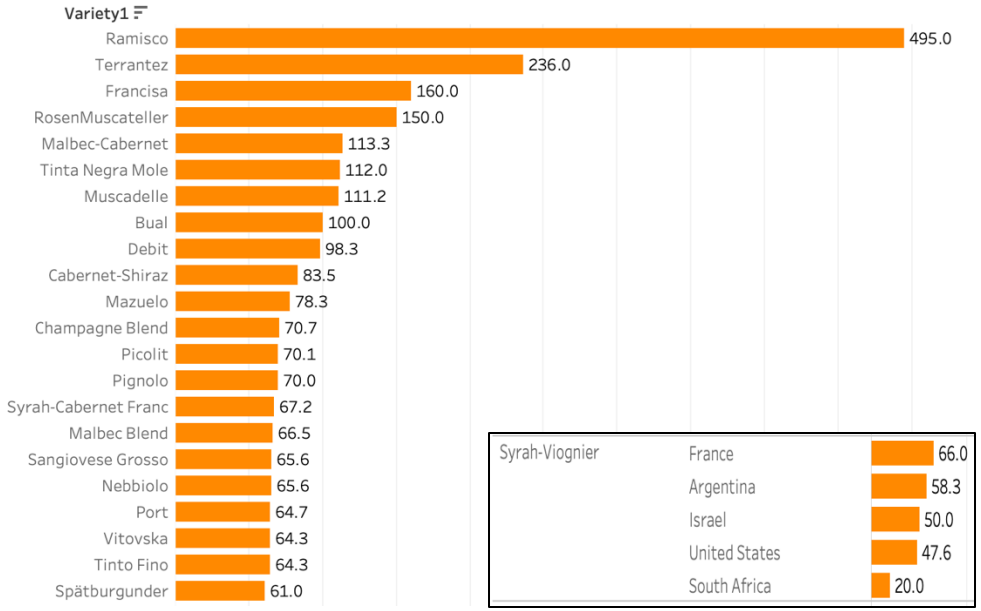


Wine Varieties – The most popular wine varieties are red wines, and there seems to be a large price difference by wine variety due to scarcity

Wine Varieties & Avg Price

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

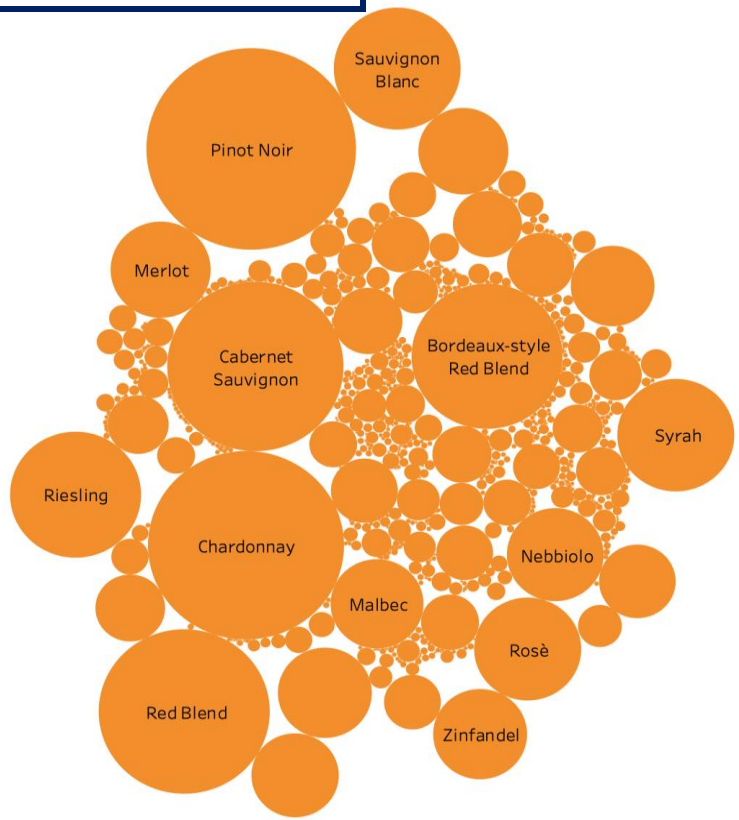
Wine Varieties with High Price



Wine Varieties

- Pinot Noir, Chardonnay, Red Blend, Cabernet Sauvignon, 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



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

- Price does not seem to correlate to more review points
- A large percentage (50% of total) of wines receives a score of at least 86 points
- On average, Anne Krebiehl has given the most points for wine reviews while Virginie Boone reviews 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

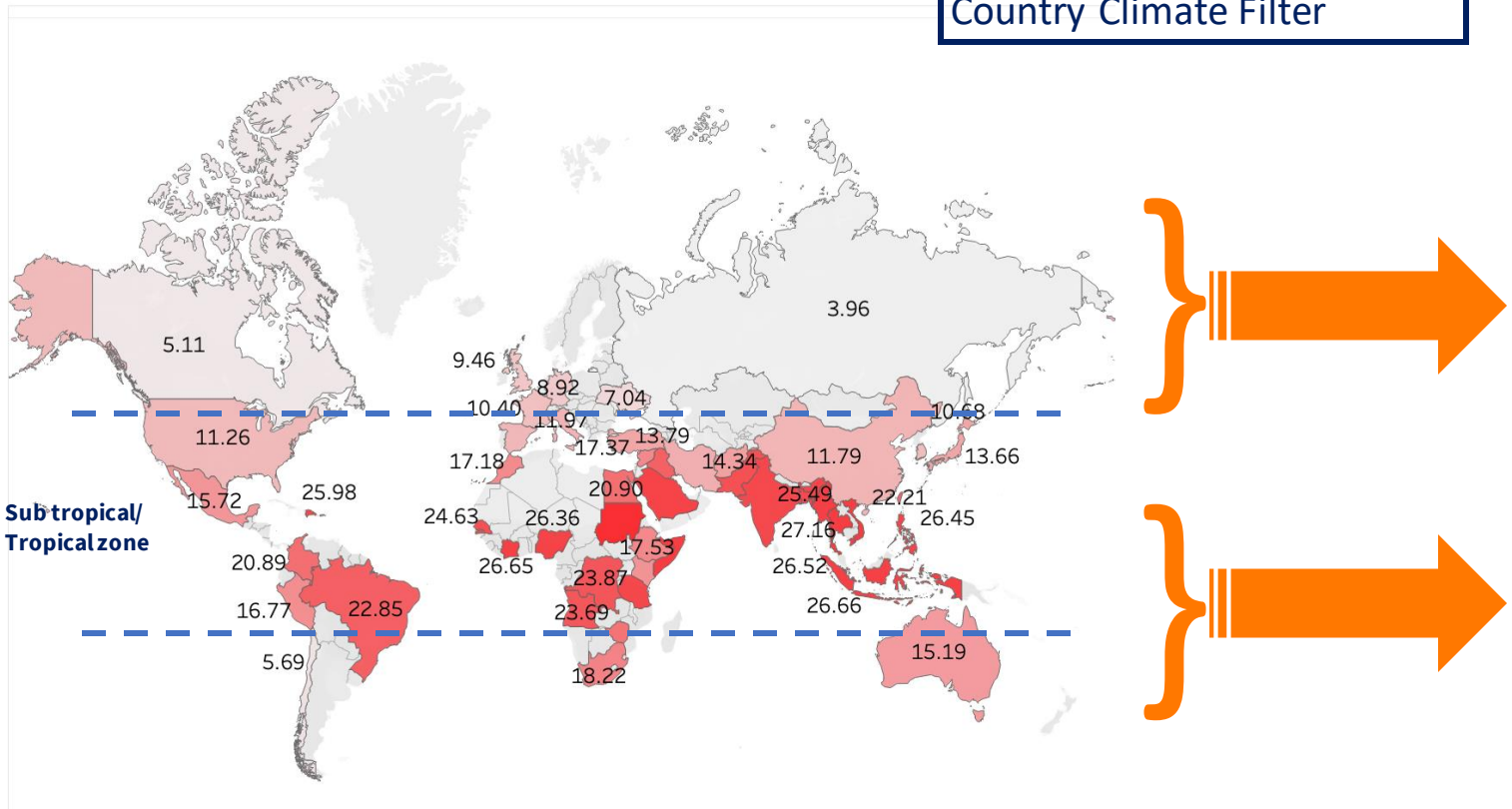
Taster Name	Avg. Points	Avg. Price	Count ..	Percentile (5..
Roger Voss	89	39	25,514	88
Michael Schachner	87	25	15,134	87
Kerin O,ÄôKeefe	89	42	10,776	89
Virginie Boone	89	47	9,537	90
Paul Gregutt	89	34	9,532	89
Matt Kettmann	90	39	6,332	90
Joe Czerwinski	89	35	5,147	89
Sean P. Sullivan	89	34	4,966	89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

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

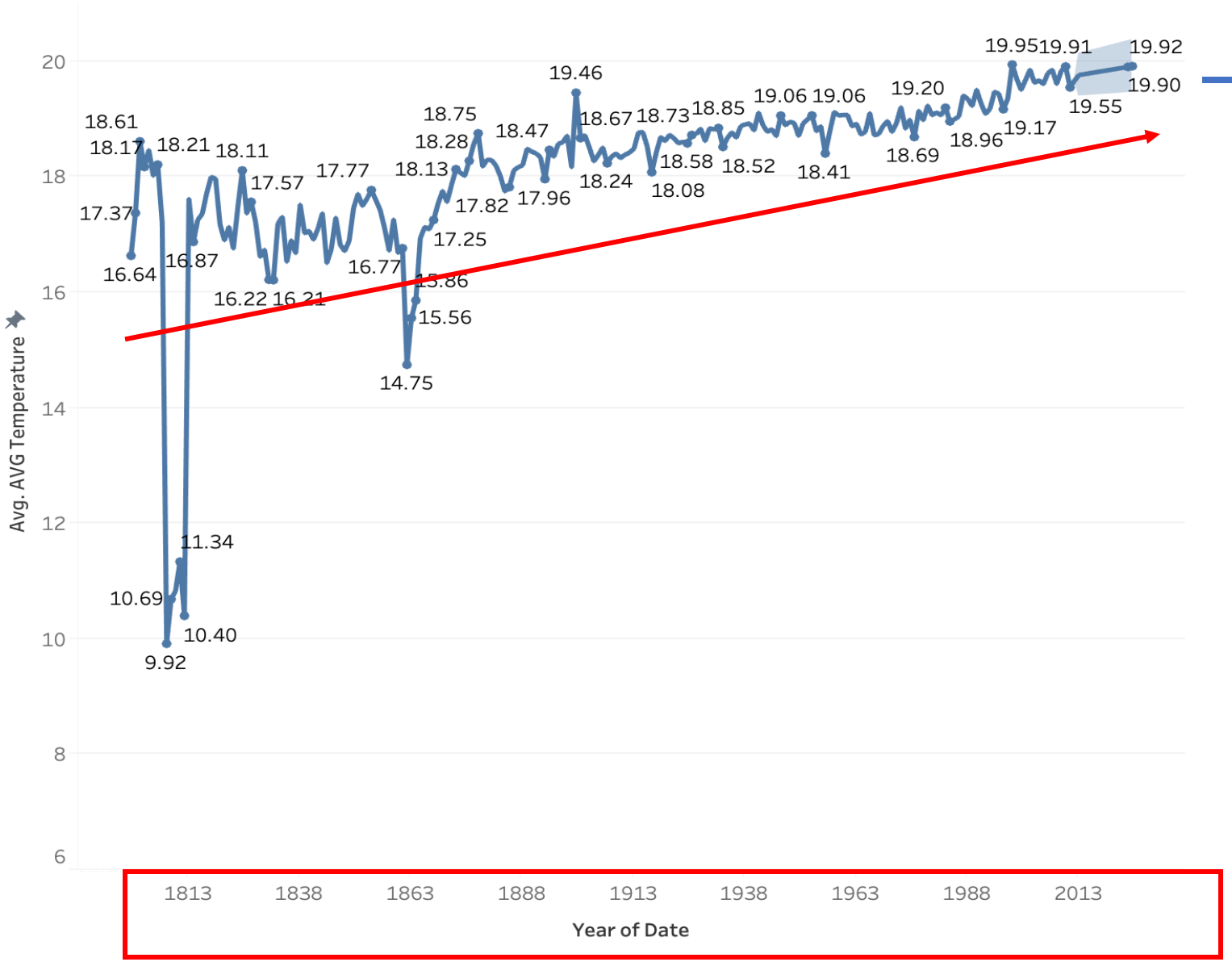
AVG Temperature by Country

Country1		Continents
India	25.81	Asia
Brazil	22.85	South America
Egypt	20.90	Africa
South Africa	18.22	Africa
Morocco	17.18	Africa
Peru	16.77	South America
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

Rank	Score
Europe	7
South America	3
Africa	3
North America	3
Asia	2
Oceania	1

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



Country Climate Prediction

Avg Temperature Prediction

- Avg temperature is set to rise by 0.15 degrees Celsius between 2013-2025
- Not all countries experience the same change in avg temperature due to climate change, economic policies, or other factors

Country Climate Effect

- Countries with historically lower avg temperature could suddenly bloom into a wine region
- Countries with increasing avg temperature due to climate change, economic policies, or other factors could negatively impact wine production

Recap

So far, we've discussed the following:

- *Wine Capital problem*
- *Analysis & insights of various factors ranging from wine reviews, points, varieties, avg climate temperature, etc.*

> 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 3: Source 3

Slide 5: Source 4

Slide 5: Source 5 (red wine glass), Source 6 (white wine glass)

Slide 6: Source 7

Slide 6: Source 8

Slide 12: Source 9

Slide 14: Source 10

All slides' grapes: Source 11

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