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### Do Top 100 wine lists provide consumers with better information?

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#### Abstract

This paper shows that the Wine Spectator Top 100 list mixes objective and subjective information while resembling a bargain wines list, in which the ranking is better when the price (score) is lower (higher). Indeed, there is a weak but positive and significant correlation between the WS ranking and the hedonic bargain wines rank calculated in this analysis. However, significant geographic bias, wineries bias, and the large part of unexplained variance of the WS ranking reveal that some subjective information also determines the WS Top 100 ranking. This blend of objective and subjective determinants, added to the formal aspect of the list, hierarchized from 1 to 100, might mislead the consumer into considering this ranking as a “best (top 100) bargain wine list”. Therefore, this impossibility to disentangle objective from subjective information could be seen as a source of inefficiency on the wine market. Splitting the WS Top 100 list into a hedonic bargain wine list (based on objective components) and a non-hierarchized “crush” wine list could be a solution for reinforcing the quality of the information on the wine market.

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## Abstract

This paper shows that the Wine Spectator Top 100 list mixes objective and subjective information while resembling a bargain wines list, in which the ranking is better when the price (score) is lower (higher). Indeed, there is a weak but positive and significant correlation between the WS ranking and the hedonic bargain wines rank calculated in this analysis. However, significant geographic bias, wineries bias, and the large part of unexplained variance of the WS ranking reveal that some subjective information also determines the WS Top 100 ranking. This blend of objective and subjective determinants, added to the formal aspect of the list, hierarchized from 1 to 100, might mislead the consumer into considering this ranking as a “best (top 100) bargain wine list”. Therefore, this impossibility to disentangle objective from subjective information could be seen as a source of inefficiency on the wine market. Splitting the WS Top 100 list into a hedonic bargain wine list (based on objective components) and a non-hierarchized “crush” wine list could be a solution for reinforcing the quality of the information on the wine market.

### 1. Introduction

Wine is an experience good which requires a mechanism for reducing information asymmetry between the consumer (who is unaware of the quality of the wine before consuming it) and the producer (who knows the quality of his wine). This quality-disclosure mechanism exists thanks to the work of a large number of wine experts. Experts in the wine world have been extensively analyzed in the academic literature. A large body of wine economic literature highlights the lack of wine experts’ consistency (see Storchmann, 2012, for a survey). Indeed, this literature underlines the absence of consensus among experts (Cliff and King, 1996; 1997; Ashenfelter, 2006; Hodgson, 2008, 2009; Ashton, 2011; Cardebat and Paroissien, 2015), their lack of reliability over time (Hodgson, 2008, 2009, Cao et al. 2010), the systematic bias of their judgements due to their preferences (Masset et al., 2015; Cardebat and Livat, 2016; Oczkowski, 2017) or due to systematic measurement errors (Cardebat et al., 2014; Oczkowski, 2016).

The experts publish their comments and their grades in different media such as guides, letters, newspapers or magazines, blogs and websites, etc. In the US, which is the largest wine-consuming country in the world, the most important medium providing wine grades is the magazine entitled the *Wine Spectator* (WS)<sup>1</sup>. Beyond its notes, in December of each year, in its final issue, WS also delivers an annual Top 100 wine list. The Top 100 ranking is determined by multicriteria factors: 1) the quality of the wines; 2) the availability of the wine in the US; 3) the price of the wines, which must be globally affordable; 4) the preferences of the journalists (the excitement, called the “X-Factor”). Mixing different criteria to assess the interest of a wine for consumers appears to be a valuable tool for providing more information to consumers. However, multicriteria wine lists already exist, based on quality (defined by an expert score) and price. Such lists are very popular in the press (Miller et al., 2015; Gaeta and Corsinovi, 2014). A best wines list consists, therefore, of a list of wines ranked by their quality-price ratio. The academic literature also proposes some bargain wines lists founded on hedonic regressions since the seminal paper of Oczkowski (1994).

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<sup>1</sup> With close to 3 million readers: [http://www.mshanken.com/images/ws/WSMediaKit\\_2016.pdf](http://www.mshanken.com/images/ws/WSMediaKit_2016.pdf).

To what extent does the WS Top 100 list differ from bargain wines lists based on a quality-price ratio? What are the main determinants of the ranking of these Top 100 lists? Finally, does this list provide additional information to the consumer compared to a basic quality-price analysis? What is the interest for the consumers in terms of information?

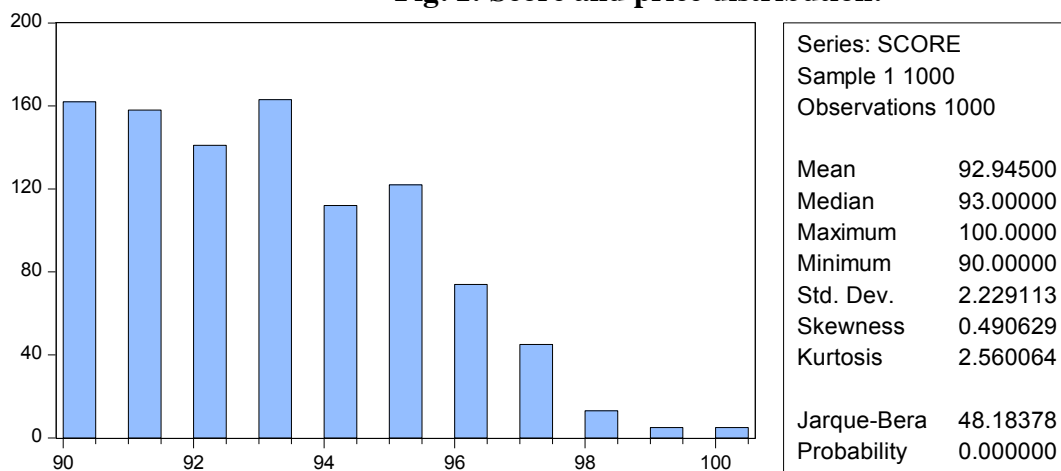
The following sections of the paper present the data (2), the method and results (3), and propose an interpretation of these results (4) before concluding (5).

## 2. Data

Wine Spectator has released its Top 100 list since 1988. The WS editors select the best wines of the year from the thousands they reviewed during the course of the previous twelve months. The lists are based on quality (based on score), value (based on price), availability (based on the number of cases either made in the USA or imported) and excitement (called the *X-factor*). According to the WS editors, the top 100 lists cover a diverse group of wines – ranging from emerging labels and regions to traditional estates – and all generate the excitement defined by the editors as the *X-factor*. These criteria are applied to the wines that rated as outstanding (90 points or higher on Wine Spectator’s 100-point scale) each year to determine the WS Top 100.

This study takes into account 1000 wines mentioned in the Wine Spectator Top 100 lists from 2005 to 2014. Figure 1 shows the distribution of the scores and the prices over that period. Most of the WS’ scores are distributed between 90 and 94. Less than 40 wines reach a score higher than 98. According to the Wine Spectator’s 100-point scale, a wine scoring 95–100 is considered “Classic: a great wine” and a wine from 90–94 is “Outstanding: a wine of superior character and style”. About 70% of the wines are sold for less than 50 USD per bottle.

**Fig. 1: Score and price distribution.**



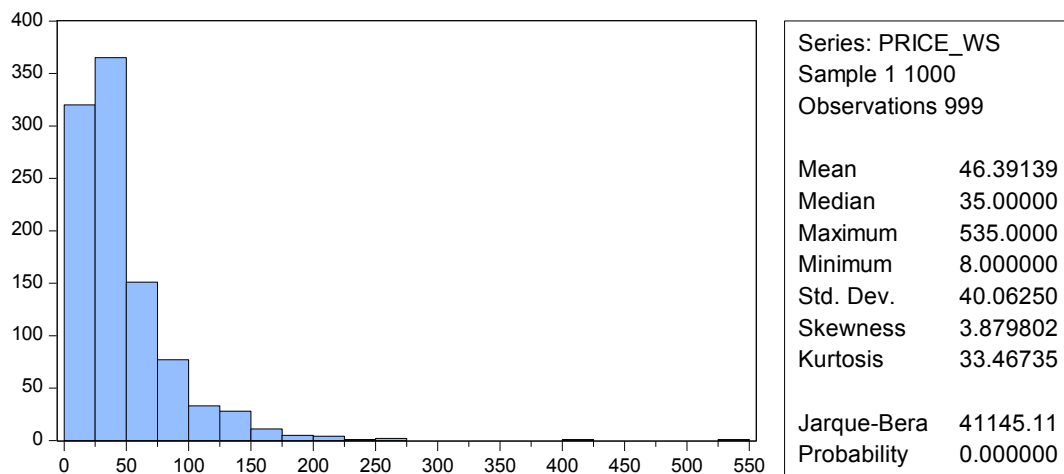


Table 1 exhibits the origin of the wines. American wines are over-represented, especially those from Napa Valley. An explanation for this higher proportion of US wines might be the factor of availability on US shelves. France and Italy, as the main producers of quality wines and the main exporters of quality wines to the US, are also largely represented. However, very few French Denominations (DOs) are in the top 25 of the most cited wine regions by WS between 2005 and 2014.

**Tab. 1: Countries of origin and most represented DOs (2005-2014)**

Countries	Proportion	Mean price	Mean grade	Rank	TOP 25 DO/Wine region	nb
Argentina	3,3%	43,9	92,4	1	Napa Valley AVA	63
Australia	7,0%	34,8	92,4	2	Australian Geographical Indication	48
Austria	1,6%	18,2	91,3	3	Châteauneuf-du-Pape AOC	33
Canada	0,1%	65,0	94,0	4	No Appellation	31
Chile	3,0%	40,1	92,2	5	Columbia Valley AVA	28
Germany	2,1%	26,6	92,0	6	Mendoza	28
France	20,9%	68,3	93,2	7	Douro DOC	26
Greece	0,8%	16,9	90,3	8	Rioja DOC	26
Hungary	0,5%	55,6	93,2	9	Willamette Valley AVA	26
Israel	0,2%	60,0	90,0	10	Russian River Valley AVA	25
Italy	15,3%	46,6	93,1	11	Barolo DOCG	23
New Zealand	2,5%	21,4	91,6	12	Toscana IGT	22
Portugal	3,5%	53,3	93,4	13	Brunello di Montalcino DOCG	20
RSA	1,7%	28,4	92,1	14	Paso Robes AVA	16
Spain	7,2%	25,9	91,8	15	Sonoma Coast AVA	16
USA	30,3%	70,4	93,6	16	Sonoma Valley AVA	15
				17	Champagne AOC	13
				18	Marlborough	13
				19	Chianti Classico DOCG	12
				20	Colchagua Valley	12
				21	Mosel	12
				22	Walla Walla Valley AVA	12
				23	Qualitätswein bestimmter Anbaugebiete	11

	(QbA)	
24	D.O. Duero	9
25	Santa Cruz Mountains AVA	9

### 3. Method and results

The aim of this section is twofold: identifying the main determinants of the WS Top 100 list and comparing this list to a bargain wine ranking based on a quality-price ratio.

First, a linear regression of the wines rank is performed. The general model takes the following form:

$$Rank_i = c + \alpha_1 \cdot Pr_i + \alpha_2 \cdot Sc_i + \alpha_3 \cdot Nb_i + \alpha'_4 \cdot (Char_i) + \alpha'_5 \cdot (Orig_i) + \mu_i \quad (1)$$

The price of the wine  $i$  ( $Pr_i$ ) and its quality (i.e., the score obtained from WS magazine,  $Sc_i$ ), should be crucial determinants of the wine position. As in a bargain wines list, the higher the price, the lesser the ranking and the higher the score, the better the ranking. The variables  $Nb_i$  (i.e., frequency with which a winery appears in the WS Top 100 list), and the vectors  $Char_i$  (i.e., the wine's characteristics such as colour and classification [e.g., Gran Reserva or Crus Classés]) and  $Orig_i$  (i.e., the country and region of origin of the wine) are controls.

Table 2 presents the results of the linear regression (1) using a parsimonious approach (i.e., keeping only the statistically significant results). The raw coefficient and the standardized coefficients are presented. Standardized coefficients are used to facilitate the comparability of the relative importance of the independent variables. Thus, the higher value of the standardized coefficients of the price and the score confirms that they are the principal determinants of a wine's position in the Top 100 lists of the magazine. However, the effect of price is more complex. In fact, a non-linearity was introduced (price + squared price) to test whether the effect of the price was linear.

The results demonstrate that the effect of the price on the wine's position is described by an inverse U-shaped curve. This means that for the lower values of the price (<350 USD), an increase in the price raises the position of the wine on the lists (i.e., the wine position goes towards 100, while falling in ranking because the best wine has the top rank and the 'worst' one has the one hundredth rank). This confirms that lower prices receive the highest ranking in the lists, confirming the bargain wines list status of the WS Top 100 list. However, this result is reversed for very expensive wines (i.e., the final part of the wine price distribution >350 USD).

For these wines, the higher the price, the lower the position (i.e., the better the ranking in the Top 100 lists). In relation to the score, examining the raw coefficient demonstrates that, on average, a one-point increase in the score induces a 13.3 (WS) position decrease in the list. That is, unsurprisingly, the higher the score of the wine, the higher its ranking in the Top 100 lists.

**Tab. 2: Determinants of the wines' position in the WS top 100 list**

Variable	Coefficient	Standardized Coef.	Prob.
Constant	1275.419	-	0.000
# times winery is in the Top100	-1.553	-0.099	0.000
Price	0.553	0.768	0.000
Price <sup>2</sup>	-0.000	-0.341	0.000
Score	-13.337	-1.029	0.000
Australia	-10.544	-0.093	0.000
Chile	-7.466	-0.044	0.040
Italy	-7.302	-0.091	0.000
Spain	-8.097	-0.072	0.001
USA	-7.904	-0.125	0.000
Chassagne_montrachet_aoc	29.497	0.032	0.000
Chateaufneuf_du_pape_aoc	-10.652	-0.065	0.014
Hermitage_aoc	13.989	0.015	0.004
Pauillac_aoc	-18.621	-0.057	0.023
Chianti_classico_docg	-14.932	-0.056	0.000
Chianti_docg	-31.620	-0.034	0.000
Cahors_aoc	-13.257	-0.035	0.066
Chablis_aoc	12.725	0.031	0.000
Corton_charlemagne_aoc	14.072	0.021	0.002
Cote_du_roussillon_villa	-27.035	-0.041	0.007
Dominio_de_valdepus_do	26.528	0.041	0.000
Dao_doc	-29.456	-0.045	0.000
Eola_amity_hills_ava	34.655	0.075	0.000
Gevrey_chambertin_aoc	21.692	0.033	0.001
Haut_medoc_aoc	-36.367	-0.039	0.000
Igp_collines_rhodanienne	32.051	0.035	0.000
Marlborough	-17.901	-0.070	0.000
Montlouis_aoc	47.137	0.051	0.000
Niagara_peninsula_vqa_on	50.383	0.055	0.000
Rockpile_ava	-24.561	-0.026	0.000
Saint_joseph_aoc	31.012	0.048	0.000
St_julien_aoc	-16.320	-0.053	0.066
Taurasi_docg	39.753	0.043	0.000
Victoria	18.548	0.040	0.000
Volnay_aoc	17.751	0.027	0.000
R-squared	0.602		
Adjusted R-squared	0.586		
F-statistic	38.164	Prob(F-stat.)	0.000
Observations:	1000		

The standardized coefficients reveal that the other determinants of wine position have a lesser relative weight. However, Table 2 reveals that for WS, the origin of the wine (country and region

DO) is often significantly associated with a better (when the coefficient is negative) or a lower (when the coefficient is positive) position in the Top 100 list (compared to the country and DO origins absent from the regression result; see Table 1 for the complete list of the country and DOs).

In particular, US origin has a strong effect on wine position in that US wines are significantly and strongly the highest ranked in the Top 100 lists. This analysis confirms the existence of a national bias for WS. Australia is another country benefiting from a relatively strong positive bias in its list positioning for WS. The results also exhibit bias in relation to the region DO and the frequency with which a winery appears in the WS Top 100 lists. The more frequently a wine appears in the lists, the higher the ranking of the wine. The part of the variance explained by the model is approximately 60%. The remaining part of unexplained variance could be interpreted as the X-factor mentioned by the magazine.

To perform a robustness check, we also used a probit and a logit model which both examine the probability of being included among the best rated wines, defined as the top 10 in the Top 100 lists. We also considered the top 20 and top 25 of the Top 100 lists. All the results (non-reported here) are qualitatively equivalent to those displayed in Table 2. Especially, price, score and the wines' characteristics have the same qualitative effect on the position of the wine in the Top 100 list.

Secondly, we compared the WS ranking with a bargain wines rank. The method used for making a bargain wines list is based on a hedonic regression of the wine prices (see Oczkowski, 1994; Miller, 2015). From the hedonic regression of the wine prices we kept the residuals  $\varepsilon_i = p_i - \hat{p}_i$  from the following hedonic equation:

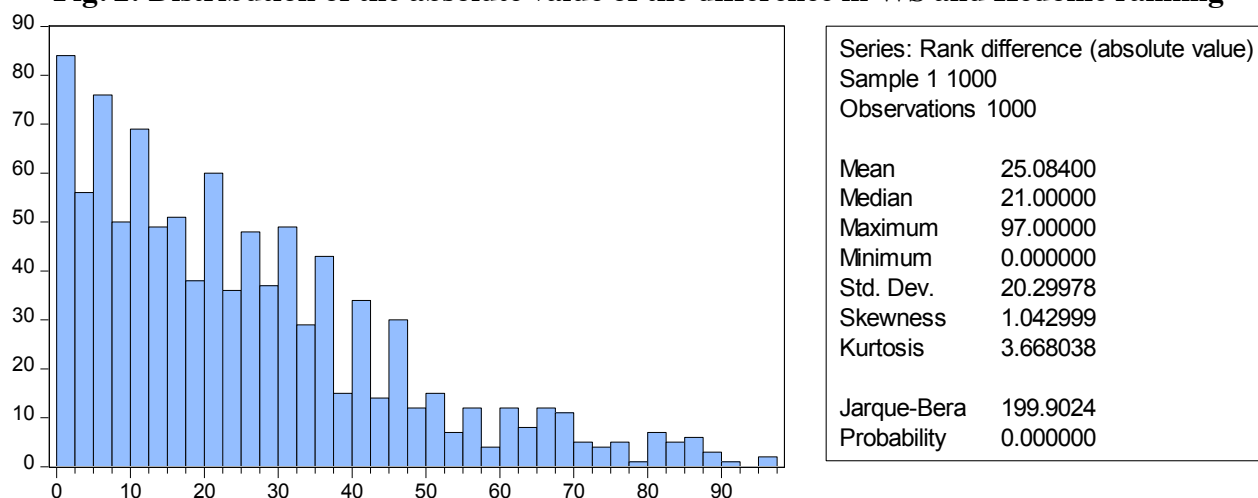
$$p_i = \hat{p}_i + \varepsilon_i = \left( c + \beta_1 \cdot Sc_i + \beta_2 \cdot Nb_i + \beta'_3 \cdot (Char_i) + \beta'_4 \cdot (Orig_i) \right) + \varepsilon_i \quad (2)$$

The higher the residual ( $\varepsilon_i$ ), the higher the observed price ( $p_i$ ) compared to its hedonic theoretical value ( $\hat{p}_i$ ). In this case, the wine can be seen as “too” expensive and cannot be considered as a bargain wine. Based on these residual values, the wines are ranked in a bargain wines list. The WS ranking and this bargain ranking can then be compared.

Figure 1a (in appendix) exhibits, from 2005 to 2014, the respective ranks obtained by each wine in the WS list and in the hedonic bargain wines list respectively. Figure 1a provides ambiguous information. On one hand, the upward regression line in each graph reveals a positive correlation between both rankings. The overall correlation (Spearman Rank-Order Correlation) over the 1000 observations is 0.375 and is statistically significant at 1%. This means that globally, the WS ranking is positively associated with a bargain ranking. On the other hand, each graph exhibits a strong dispersion, especially in 2005, meaning that this relation is poor. The part of the WS ranking variance explained by the hedonic ranking is worth 14%.

Figure 2 analyzes the ranking difference for the whole sample of wines. On average, there is a difference of 25 positions between both rankings. Therefore, the correspondence between both rankings appears as weak.

**Fig. 2: Distribution of the absolute value of the difference in WS and Hedonic ranking**



#### 4. Discussion

As in a bargain wines list, prices (negative impact) and scores (positive impact) are two of the determinants of the WS ranking. However, although the WS ranking is positively correlated with a traditional hedonic bargain wines ranking, the relation is weak. The other determinants of the WS ranking seem to play an important role. In particular, there is a strong geographic bias; US wines appear as privileged, i.e. they received on average a significantly better ranking in the WS list.

One possible interpretation of this bias is the wines' availability on the US shelves. US wines are probably easier to find on the US market compared to foreign imported wines. Another explanation that cannot be ignored is national bias, that is, the bias of the magazines towards US wines because the magazines are also produced in the US and have a predominantly US readership.

The frequency of appearance of the wineries in the WS list is also a factor positively influencing the ranking. Some wineries are more frequently quoted than others and therefore receive a better ranking on average. All the determinants used in the regression explain 60% of the WS ranking variance. The remaining 40% would be interpreted as the X-factor, i.e. the excitement provided by a wine or the subjective opinion of the experts. The X-factor could then be seen as the main determinant of the wine ranking.

Another possible interpretation of the geographic and the winery biases would lie in a form of collusion between WS and some wineries. This issue has been raised in two former studies examining the possibility of a positive bias in WS's ratings or awards towards firms that pay for advertising space or awards competitions. Ashenfelter et al. (2011) demonstrated that an invented restaurant was able to receive the WS Award of Excellence. The researchers created a false restaurant that they called *Osteria l'Intrepido*, which was said to be located in Italy, typed a menu, created a wine list, and submitted the menu and wine list to WS, along with a \$250 fee. The list was approved and given an Award of Excellence. Reuter (2009) examined the correlation



between wine price and rating, and whether WS tasters give better ratings to wineries that advertise in their magazine. He found that ‘although the average Wine Spectator ratings earned by advertisers and non-advertisers are similar, [...] advertisers earn just less than one point higher Wine Spectator ratings than non-advertisers when [he] use[s] Wine Advocate ratings to adjust for differences in quality’. These findings raise serious questions about the value of the information WS provides to readers, and raise doubts about the informative value of the Top 100 wine lists published each year by WS.

However, this last statement is pure speculation in our study. Let us assume therefore that there is no collusion. What is the interest of this list for the consumer? The WS Top 100 list provides diversified information, mixing objective characteristics of the wine (price and score), with market information (availability of the wines on the US shelves, even if nothing is said in the WS website about the calculation of any wine availability indicator) and subjective information (the X-factor). Compared to a pure bargain wine list only based on score and price, the WS list adds a significant degree of subjectivity mudding the waters in the wines’ quality assessment. The consumer is therefore unable to determine whether the ranking of a specific wine is due to its objective quality (price-score ratio) or to its subjective appreciation by an expert. In this sense, the WS list has a highly limited impact on the reduction of the consumer information asymmetry. Worse, because he cannot disentangle objective and subjective information contained in the WS Top 100 list, the consumer could be confused and misled in his purchasing behavior.

Our suggestion in order to enhance the information of the consumer would be to publish two different lists. The first would be based on a hedonic regression, as made in the academic literature. Such a bargain wines list should deliver objective information to the consumers interested in quality-price ratios. This list would be hierarchized on a quantitative basis. The second one, based on excitement, could be interpreted as a “crush” list, with no hierarchy since it has no sense in this subjective context.

## **5. Conclusion**

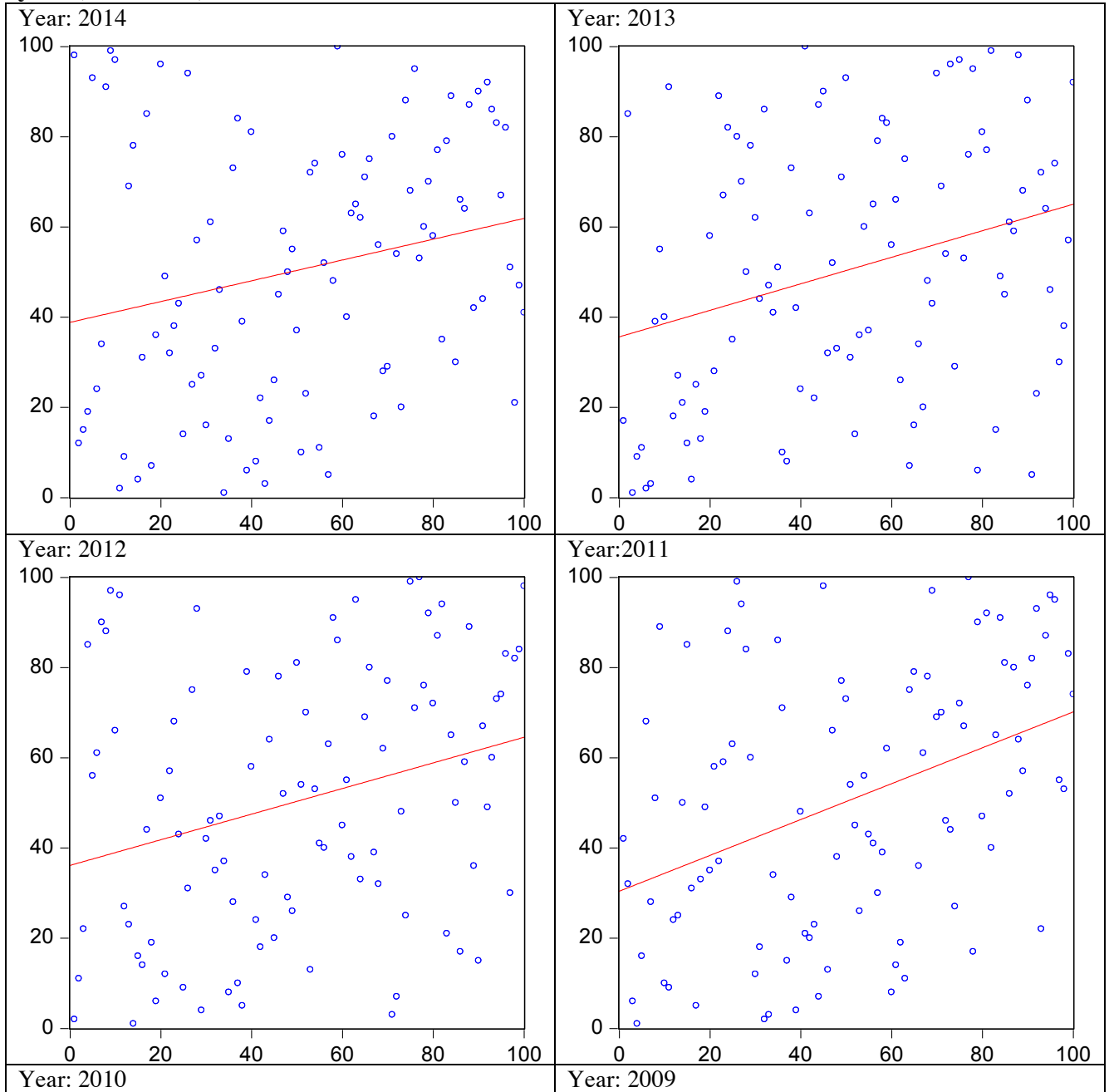
This paper shows that the WS Top 100 list mixes objective and subjective information while resembling a bargain wines list, in which the ranking is better when the price (score) is lower (higher). Indeed, there is a weak but positive and significant correlation between the WS ranking and the hedonic bargain wines rank calculated in this analysis. However, significant geographic bias, wineries bias, and the large part of unexplained variance of the WS ranking reveal that subjective information also determines the WS Top 100 ranking. This blend between objective and subjective determinants, added to the formal aspect of the list, hierarchized from 1 to 100, might mislead the consumer into considering it as a “best (top 100) bargain wine list”. Therefore, this impossibility to disentangle objective from subjective information could be seen as a source of inefficiency on the wine market. Splitting the WS Top 100 list into a hedonic bargain wine list (based on subjective components) and a non-hierarchized “crush” wine list could be a solution for reinforcing the quality of the information on the wine market.

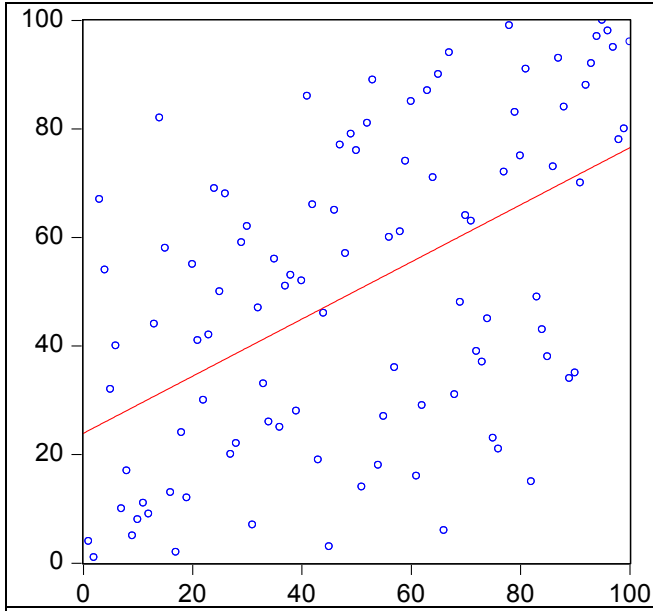
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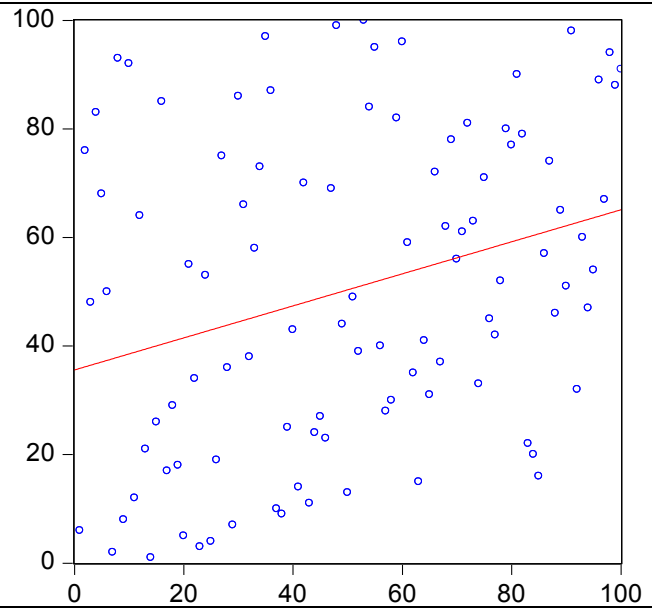
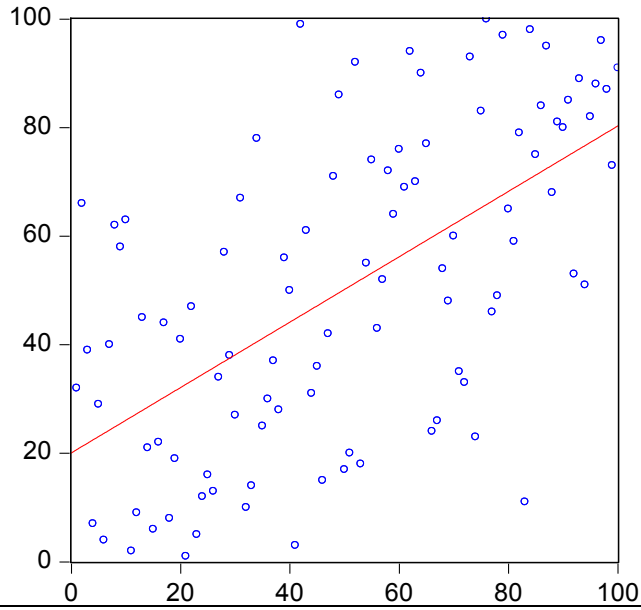
## APPENDIX

**Fig. 1a: Wine Spectator rank (X axis) vs Hedonic bargain rank (Y axis) for each wine by year (2005-2014)**

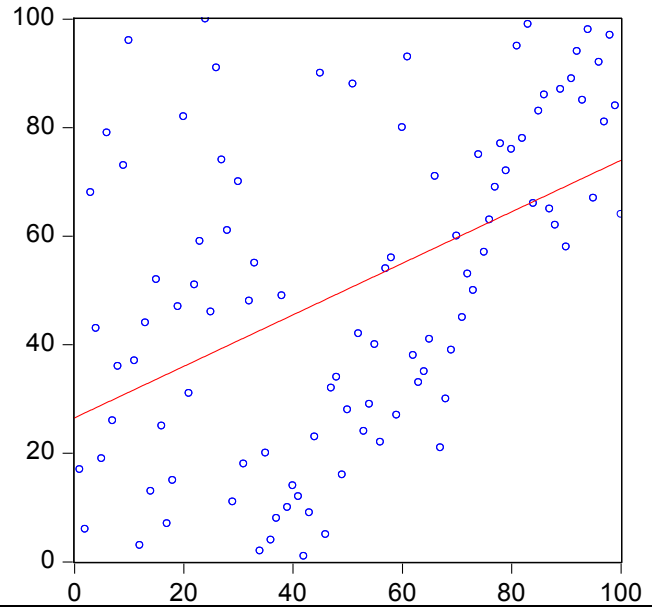




Year: 2008



Year: 2007



Year: 2006

Year: 2005

