The Roles of Social Media and Expert Reviews in the Market for High-End Goods: An Example Using Bordeaux and California Wines

Alex Albright, Stanford/Harvard University
Peter Pedroni, Williams College

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Overarching goal

Try new approach to evaluating/understanding expert impact on price by exploiting social media data

We take wine as a fitting case study

“Our best—rated over 700 in both Math and Verbal.”

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Existing approach to expert influence

- Impact of an expert review entirely attributed to his/her reputation (eg., Reinstein et al. 2005; Ali et al. 2007)

- Leads to impression that market price is highly influenced by a few expert reviews

- But, expert reviews are driven in part by underlying quality
  - In turn drives price
The appeal of wine as a case study

Features of wine that are attractive for the purposes of structural analysis:

▶ Interesting signal extraction problems: Quality is not fixed; it evolves over time in a non-monotonic fashion, rising for a period before falling

▶ Once wine has been produced and released, the evolution of wine quality is exogenous to reviews (unlike the case with, say, restaurants)
More attractive features:

- Strong expert reviewer presence (ie, Robert Parker for the sake of the analysis)

- Wine boasts a uniquely informed and extensive rating community: CellarTracker.com
More on CellarTracker

- A few hundred thousand users
- Tracking tens of millions of bottles of wines
- Over 5 million tasting notes

Difficult to successfully manipulate the online ratings since:
  - For high-end wines, the number of reviews can be fairly large
  - Users can see number of reviews by others and can discount opinions of others who only have a few reviews completed
Data for analysis

Collect CellarTracker scores as well as:

- Parker events via eRobertParker.com
  - Difference between revisionary review and previous review
  - First reviews come out too quickly to see impact of event with respect to CellarTracker data

- Auction prices (Wine Market Journal)
- Retail prices (Wine-searcher.com)
What do we mean by quality?

Features of the wine that consumers care about

- Quality is not just peoples’ opinions or personal preferences
- Components of wine: concentration of fruit, level of tannins, acidity, etc.
  - Longevity (aided by combination of three above) factored into quality
- Quality changes over time
  - Makes quality assessments difficult/complex
- Note: quality characteristics people care about for a given wine depends on the person and the type of wine being consumed
Other factors matter for price as well

While quality corresponds to internal factors (those \textit{inside} the bottle), factors \textit{outside} the bottle also influence price

- Think name/label
- Especially relevant: expert review scores
  - Consumers ascribes social value to these (bragging rights)
How do we distinguish between these?

We have the public & we have CT community

Both conduct signal extraction problems to make decisions about price

But, CT users **also** make a decision about scores
  - Learn/filter in a way they do not for price decision
  - Exploit this difference for the purposes of identification
How do we do this econometrically?

Use method developed in Pedroni (2013)

- Identify unobservable shocks in heterogeneous panel via a VAR method
- Allows for endogeneity of variables (price and Cellarracker scores)
- Allows for heterogeneity in relationship between wine attributes and quality assessments across wines, i.e. not all wines are evaluated by the same criteria
- Accounts for evolving nature of wine
- Accounts for the dynamic effect of vintages over time on both price and quality assessments
Our unobservable shocks

Wine quality itself evolves in a smooth manner, but new information that arrives about its quality comes in the form of shocks = "quality information shocks"

Wine price is impacted by other factors that influence supply and demand for wine after it has been produced = "other" shocks (a sort of catch-all)
Pedroni (2013) VAR approach

We use a bivariate VAR process

- VAR for each wine
- VAR is 2-equation, 2-variable model (log cellarTracker scores and log auction prices)
- Each variable is explained by its own lagged variables as well as the current and past values of the other variable
- Want to obtain the impulse responses of our endogenous variables (reactions of these variables at time of shocks and in subsequent quarters)
Specifics of identification

Use CT to help in identification

- Other shocks have no immediate direct impact on CT quality assessment
- They have indirect impact over time since they impact price, and CT reviews may be done in part conditional on price
  - ie, "what is the quality relative to the price I paid?"

- Key identifying restriction (for SVAR) specifies: CellarTracker scores do not change in the short-run w.r.t. other shocks
  - Restricts an element of the impact matrix
Bringing in Parker

Treat Parker as known event & decompose into the two shocks of interest (quality information & other)

What does "other" mean for Parker? Argue it is a publicity shock, since Parker reviews:

(1) are an innovation to the quality information stockpile [quality information shock]

(2) disseminate information to a larger audience (due to his reputation), thus raising awareness [publicity shock]
Interpreting results

- Impulse responses describe reaction of endogenous variables at time of shocks and during subsequent time periods.
- Since using logs, these are percent responses.
- There are impulse responses for each wine and each looks different.
  - Challenge: these graphs represent responses for the whole sample—illustrate the spread of the responses.
  - Represent with quantiles (not showing confidence intervals).
Responses to the two types of shocks

Without Parker:

Response of price to other/publicity shocks is much larger than response to quality information shocks

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Now we want to decompose the Parker shocks into quality information & publicity parts...
Results to the two components of Parker

Story of heterogeneity of mean reviewer score among different wines relative to Parker
Summary of results

- Evidence that expert reviews influence the market primarily due to the publicity effect, rather than due to quality information effect

- Heterogeneity of average CT reviewers among different wines relative to Parker
  - Potential story here: components of wine evaluated differently due to geographic context
  - I.e: Parker-favored components (Parkerization) generate different ratings in Bordeaux vs. California
Future work

- Look into wines making up the graphs for further understanding of heterogeneity of CT across different wines (esp w.r.t. California vs. Bordeaux geography)

- Look into specific characteristics of wine associated with both CT and Parker reviews
  - Scrape the textual components of CT/Parker reviews and investigate descriptive characteristics
  - Special attention to classic descriptions of "Parkerization"
Thanks!
Questions?