### Title
Interdependency of Grape Crushing and Purchasing in California Wine Industry

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Conference Presentation

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### Keywords
Grape Crushing, Grape Purchasing, Grape Pricing

### Research Question
Are grape purchasing, crushing, and pricing among 17 California Grape Pricing Districts correlated?

### Methods
Standard VAR and Panel VAR models

### Results
They are correlated. Red grape varieties are more correlated than white grape varieties.

### Abstract
Interdependency of Grape Crushing and Purchasing in California Wine Industry

This study investigates the relationship between grape crushing and pricing in California. The research focuses on the correlation among grape purchasing, crushing, and pricing across a total of 17 California Grape Pricing Districts, including Sonoma (District 3), Napa (District 4), Monterey and San Benito (District 7), and San Luis Obispo, Santa Barbara, and Ventura Counties (District 8). This research, initiated by the Wine Business Institute at Sonoma State University, was prompted by the board members' desire to examine the relationship between grape pricing within neighboring regions. The board members were particularly interested in the significant difference in average pricing per ton of grapes between Napa Valley and surrounding regions, such as Sonoma and Lake County. It was deemed crucial to empirically test the extent to which proximity to Napa Valley impacts the change in average grape pricing in surrounding regions over time.

This research holds significance for Californian wine businesses for three reasons. First, grape pricing is one of the most critical subjects in the wine industry. Second, while there are strong references on grape pricing in Europe, there is, as far as I am aware, no academic research on grape pricing and its correlations among Californian wine districts. Lastly, this research can provide meaningful insights to Californian grape growers for their production and forecasting.

To empirically test these correlations, this study uses the California Grape Crush reports published by the United States Department of Agriculture (USDA). These annual reports cover every grape variety produced in California, spanning from 2004 to 2021 for all 17 Californian grape pricing districts, with a total of approximately 300,000
observations. To display how dominant districts, such as Napa and Sonoma, affect grape crushing and pricing in other districts, the study separates grapes into two groups: White and Red. The White group contains five white varieties (Chardonnay, French Colombard, Muscat of Alexandria, Pinot Gris, and Sauvignon Blanc), while the Red group includes five red varieties (Cabernet Sauvignon, Merlot, Pinot Noir, Rubired, and Zinfandel).

The study employs standard VAR models to demonstrate how decisions by a district affect grape purchasing and crushing in other districts. Panel VAR models are utilized to detect the overall relationship among all 17 districts. Initial empirical findings reveal that, for red wine grapes, grape crushing by dominant districts, such as Sonoma and Napa, has a statistically significant impact on grape crushing in other districts, and this effect is persistent. However, statistically, Sonoma and Napa counties do not influence white wine grapes; grape purchasing and crushing in these counties do not alter purchasing and crushing in other districts. Instead, for white wine varieties, Monterey and San Benito counties have the most significant influence on grape crushing in other districts. Overall, red wine grapes exhibit a stronger correlation in terms of crushing and purchasing among Californian 17 grape districts than white wine varieties. The effects also last longer with red wine varieties than with white varieties.

As of now, this study has produced empirical outputs on crushing and purchasing grapes and is investigating correlations in grape pricing. Given the substantial volume of the crushing and purchasing part of this research, the grape pricing aspect can be separated and integrated with wine pricing, forming another independent research paper.

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