

## Padua 2017 Abstract Submission

### Title

Analyzing Barrel Purchasing Decisions on Winery Costs

### I want to submit an abstract for:

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### Keywords

early pay discounts, wine, input prices, cost minimization, exchange rates

### Research Question

This is the first paper to investigate the existence of an optimal decision rule regarding the purchasing of wine barrels; early with a discount or upon delivery without.

### Methods

The present work analyzes historical barrel-specific data over the last fifteen years from a barrel used by Continuum Estate in Sonoma, California, along with exchange rate data to minimize costs.

### Results

Early purchasing of French oak barrels over the past fifteen years, accounting for lost interest, would have decreased average winery costs by over \$60,000 as compared to paying upon delivery.

### Abstract

As a producer of any good or service, one's all-encompassing goal is generally to maximize profit, which oftentimes comes in the form of minimizing cost. In some industries it is fairly straightforward to do so just by having a strong understanding of the product that you are producing and its accompanying inputs and technologies. However, in the wine industry, these decisions are increasingly complex given exchange rate volatility and limited resources of small wineries, as well as the rising costs of oak barrels for reasons related to barrel production and use elsewhere (Stamp, 2015).

Despite acknowledging the importance of barrel purchasing decisions in operating a successful winery, little to no attention has been paid to timing of purchasing within academic or practitioner publications. Instead, authors have focused on storage costs, barrel type, and quality rating implications (Noparumpa, et al., 2015; Stamp, 2015). This paper is the first to utilize data and systematically analyze the timing of this purchasing. Wineries have the option to pay for their barrels in advance with a discount, or upon delivery for full price. This choice depends not only on the discount, but since French oak barrels are purchased in euros, exchange rates also impact the real cost.

Utilizing fifteen years of price data for a specific custom made barrel, the current paper analyzes costs of purchasing the same type of barrel over time. This barrel is specifically made for winemaker Tim Mondavi, and provides a reliable starting point for the long-term analysis of understanding the expense of barrel purchasing. From these initial values, the analysis extrapolates to other similar firms' decisions using exchange rate data over the same time period.

Research within the context of the wine industry is not novel: questions range from understanding the impact of

quality ratings on price, validity and robustness of quality ratings, as well as traditional economic concepts as applied to wine. For example, researchers have found expert ratings to be highly correlated with quality ratings of self-reported wine connoisseurs (Schiefer & Fischer, 2008) and that engaging in wine futures to mitigate risk results in premiums (Noparumpa, et al., 2015). Broader scale analyses find higher quality wines have a lower exchange rate pass-through in the Argentinian wine market (Chen & Juvenal, 2016). Relatedly, evidence exists that there is a premium to higher quality in firms' export decisions for Champagne producers (Crozet, et al., 2011). In order to consider the impact of exchange rates and the early-pay discounts on costs, the present work focuses on wineries within the United States, which produce approximately 8% of the world's wine. There are 7,061 bonded wineries in the United States of America and 2,885 of those are found in California (Wine Business Monthly 2016). Production in the U.S. has broadened however, with over 600 wineries in Washington and 439 in Oregon (Wine Business Monthly 2016).

The majority of these wineries produce fine wines and use French oak barrels in the production process. In fact, French oak barrels are the overwhelming favorite with 63 percent of all new barrel purchases (Wine Business Monthly 2016), and 170,000 barrels imported annually to the U.S. (communication with Union of Barrel Makers, 2016). Though there are unlimited opinions given what makes a great wine superior, one almost universally agreed upon component of fine wine is French oak barrels, which are expensive. For example, a single Taransaud T5 barrel was €1,500 in 2016 (if you were lucky enough to be allocated any).

Much of the complexity of purchasing barrels comes from staffing at a typical small winery. The professional staff of a 10,000 case winery typically includes a Winemaker, Viticulturist, Salesperson, and Accountant. Wineries who purchase these barrels could employ winery accountants or controllers to develop a working knowledge of Euro exchange rates and hedging strategies to be used in this once a year transaction. However, given the resource constraints regarding finance decisions for the average winery, this is impractical, and barrel decisions become a small part of an annual procedure where one employee is responsible for a wide variety of financial decisions. This paper seeks a simple and consistent tactic which could be utilized by wineries without the resources to make an independent annual decision regarding when to pay for their barrels. This solution could be used annually to minimize costs over time.

Consider a typical small single vineyard wine and its barrel requirements. A typical 228 litre (60 gallon) wine barrel will hold 25 cases of wine. A high-end luxury cuvee of 1,000 cases of wine would require 40 barrels per year - assuming one hundred percent new oak. At €929 per Taransaud Ref 102 barrel it would cost the winery € 37,160 for barrels (assuming 100 percent new oak) in 2016. Roughly, \$40,000 a year is not worth adding a hedging expert. But, it is worth seeking a simple repeatable tactic.

Wineries have a few options of how to purchase their barrels. Tonnelleries (coopers) send out order forms in January and February for barrels to be delivered in August. All prices are denominated in Euros, generally with a discount for paying early. For example, Artisan Barrels & Tanks, Inc. Pricing Catalog 2016 states "3% discount for all Rousseau barrels orders placed by April 1st, 2016 and delivered by June 15, 2016. Net 30 days." Bouchard Cooperages, representing the coopers Billon and DAMY grants a 50 Euro per barrel discount (6%) for orders placed by April 15 and delivered by July 1. Barrels are typically delivered at the end of summer, just before the grape harvest begins. The first option for purchasing barrels is to purchase barrels and pay early with the discount. Another standard option is to pay thirty days after delivery; usually the end of September. The present estimates assume a 5% discount rate; a mid-range estimate for savings by paying early.

The purpose of the current work is to address this extremely important, and yet, minimally discussed question: is there a simple tactic or rule to purchase barrels and minimize costs? More specifically, using historical price patterns, what would have been the most cost effective if a winery had a single tactic and pursued it every year? These questions are made more complicated in application given the infrequency of foreign transaction, lack of institutional knowledge, plus the exchange rate volatility and high cost of French oak barrels.

The present analysis approaches this question in a specific real-world applied framework; utilizing barrel prices paid by Robert Mondavi Winery and Continuum Estates in Napa Valley. Both of these high-end wineries feature Tim Mondavi, the son of ledged Robert Mondavi, as the primary Winemaker. A bottle of Continuum sells for over \$200. Since 2001 Tim Mondavi has purchased a custom barrel; in terms of cooper, forest, toast and shape. It is the Taransaud Ref 102 barrel, considered vital to producing the high-quality red wine flavor of these wineries (Penn, 2003).

Table 1 provides calculations for the total cost of each tactic over these fifteen years, illustrating the huge advantage over time of paying in April and receiving a discount. For simplicity, the first column estimates assume the firm has no other options for the money used in the early purchasing. However, Column 2 includes an estimate of opportunity cost for the winery: the interest they could have earned if the barrel funds were spent on a 3 month

CD to earn interest. Even including this foregone interest earnings, and then purchasing later, the overall savings is roughly \$60,000 for purchasing in April with a discount. For the average winery, this amount of money is nontrivial.

We explore this simple methodology and compare to a slightly more complicated approach of using exchange rate futures to predict and compare those changes to the stated discount from barrel suppliers. These two approaches are the first attempt by a practical or academic article to explain the best option for a winery to pursue in purchasing barrels.

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**Table 1. Difference in Cost by Barrel Payment Decision**

	Pay in April vs. Pay in September		Pay in April vs. Pay in October	
	Payment Difference (Sept.– April)	Payment Difference Including Foregone Interest (3 month CD)	Payment Difference (Oct. – April)	Payment Difference Including Foregone Interest (6 month CD)
2001	\$(1,207.57)	\$(1,506.03)	\$(1,864.57)	\$(2,461.50)
2002	\$10,143.18	\$9,856.06	\$10,418.38	\$9,844.13
2003	\$4,329.85	\$3,967.72	\$9,271.85	\$8,547.60
2004	\$3,248.00	\$2,838.36	\$4,963.00	\$4,143.72
2005	\$538.65	\$107.76	\$(2,646.35)	\$(3,508.12)
2006	\$9,880.05	\$9,462.91	\$8,919.09	\$8,084.81
2007	\$7,044.62	\$6,565.92	\$11,568.62	\$10,611.22
2008	\$(2,027.52)	\$(2,616.65)	\$(6,304.32)	\$(7,482.58)
2009	\$14,015.43	\$13,505.79	\$15,837.93	\$14,818.65
2010	\$43.74	\$(474.44)	\$7,544.34	\$6,507.98
2011	\$7,029.67	\$6,474.85	\$(883.41)	\$(1,993.05)
2012	\$(626.46)	\$(1,161.69)	\$1,894.62	\$824.17
2013	\$8,473.80	\$7,943.19	\$11,797.20	\$10,735.97
2014	\$127.60	\$(448.82)	\$(4,378.00)	\$(5,530.84)
2015	\$9,148.38	\$8,689.62	\$8,403.04	\$7,485.53
Total	\$70,161.43	\$63,204.55	\$74,541.43	\$60,627.68