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Reversals in Wine Auction Prices*

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Abstract

This paper investigates reversals in wine auction prices following a series of strong positive and negative returns. Using the Chicago Wine Company's auction data, we find evidence of reversals after extreme wine price changes. There is a clear asymmetry in the market reaction to wine price increases and declines. Wine price declines after strong price increases are not, in general, as significant as wine price increases after strong price declines. The strongest reversal occurs for wines that have declined in price by more than 30 percent. (JEL Classifications: D44, G14)

Keywords: price reversals, wine auctions, wine prices.

I. Introduction

Many empirical studies in the finance literature have documented short-term reversals in stock prices. Is it possible to observe short-term reversals in wine auction prices as well? In other words, is there a relationship between changes in past wine prices and the price in subsequent months? This paper attempts to answer this question by analyzing price reversals in wine auctions held by the Chicago Wine Company using four different time filters. As for stock prices, we find evidence of reversals for wine auction prices. In the literature, stock price reversals may be attributed, in part, to the bid–ask spread, and price reversals are generally stronger

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for stocks with low liquidity. For infrequently traded assets such as wines, a liquidity trader would have to take a greater price discount. This price discount would be more severe for liquidity traders who are sellers of wines rather than buyers of wines. Therefore, we expect price reversals following negative returns to be greater than price reversals following positive returns.

Using monthly wine price changes, we find that wines with strong declining prices experience significant price reversals in subsequent periods. The strongest price reversals of 35–50 percent occur after a decline of 30 percent or more in wine prices over the previous month. The reversal in returns is weaker for wines that have increased in price. Weaker price reversals of about 10–12 percent follow an increase in wine prices of 30 percent or more over the previous two months. Thus wine price declines after strong price increases are not, in general, as significant as wine price increases after strong price declines. These results support the existence of profitable trading strategies based on monthly price reversals for wine investors.

The remainder of the paper is organized as follows. Section II discusses the relevant literature on reversals in stock prices. We discuss the basic information about wine auctions and present the methodology and the data for this study in Section III. Section IV reports the empirical results, and Section V contains the concluding remarks.

II. Literature Review on Reversals in Stock Prices

Most of the literature on reversals is associated with stock prices and supports the hypothesis that stocks with strong returns over a week or a month tend to reverse themselves over the subsequent week or month. Lehmann (1990) finds reversals in weekly stock returns, and he formulates a trading strategy based on weekly reversals that is profitable even after accounting for the bid–ask bounce and transaction costs. Jegadeesh (1990) detects negative first-order serial correlation in weekly and monthly stock returns and a positive correlation for longer lags, particularly twelve months. Bremer and Sweeney (1991) find that large negative stock returns are followed by positive rebounds over the next two days. Conrad et al. (1994) observe that high-transaction securities undergo price reversals, while the returns of low-transaction securities are positively autocovarying. Cooper (1999) reports reversals after a period of strong stock returns. Avramov et al. (2006) analyze NYSE-AMEX stocks and report stronger reversals for losing stocks. McInish et al. (2008) report significant profits from reversal or contrarian strategies in the Japanese stock market. Other financial assets also exhibit reversals; Wang and Yu (2004) find reversals in futures market prices.

Short-term reversals in stock returns have several possible explanations. One is related to market microstructure effects (bid–ask bounce and other liquidity problems). Several studies attribute reversals at least in part to the bid–ask bounce. Kaul and Nimalendran (1990) show that bid–ask errors are the predominant source

of stock price reversals. Conrad et al. (1991) demonstrate that negative autocorrelation is partially explained by bid–ask errors. Ball et al. (1995) attribute the short-term profitability of contrarian strategies to the bid–ask bounce. Cox and Peterson (1994) analyze large one-day stock price declines and find that the bid–ask bounce and market liquidity explain price reversals.

Another explanation is related to behavioral effects (stock market overreaction/correction hypothesis). Subrahmanyam (2005) observes that the bid–ask bounce cannot fully explain reversals in returns, and Platt (2006) reports a next-day reversal after negative stock returns even when the minimum spread declined to $0.01. Jegadeesh and Titman (1995) find that short-horizon reversals may be caused by imbalances in specialists' inventory. Avramov et al. (2006) report that the largest reversals occur in low liquidity stocks and attribute reversals to price pressure caused by noninformational demands for immediacy. Cooper (1999) examines the overreaction hypothesis and supports that decreasing volume stocks experience greater price reversals. Zawadowski et al. (2006) find reversals after large intraday price changes. However, the spread subsequently increases, eliminating most of the profits. More recently, Watkins (2006) finds consistency in two-week returns for firms with high institutional ownership. Subrahmanyam (2005) believes that inventory effects are not sufficient to explain reversals in monthly returns. The reversals may be partly driven by belief reversion. Nam et al. (2001) find mean reverting patterns in U.S. monthly return indices and evidence supporting the stock market overreaction hypothesis. Gutierrez and Kelley (2008) report that extreme weekly returns are followed by reversals, and these reversals themselves are followed by a continuation of returns. Finally, Yalçın (2008) finds that reversals are stronger among stocks with low information diffusion rates.

III. Wine Auctions and Data

We obtain wine auction prices from the Chicago Wine Company (TCWC) Web site. TCWC follows the English auction model, which is commonly used to sell wine and art (see Ashenfelter, 1989). An English auction, also known as an ascending price auction, starts with a low price for the item for sale (wines are sold in lots ranging from a single bottle to several cases), which is successively raised (either by the auctioneer or by the bidders themselves) until only one bidder remains and the auctioneer "hammers down" the item for sale. Then, in most cases, the highest bidder pays the hammer price for the item if it is higher than the reserve price (the minimum selling price for the item, which is generally not revealed to bidders to discourage collusive bidding). TCWC does not charge lotting fees, buy-in fees for unsold wines, and insurance fees. While auctioneers typically receive a commission from both the buyer and the seller, TCWC does not charge a buyer's premium, so successful bidders pay no more than the hammer price. Marks (2009) finds that auctioneers' commissions paid by the buyer are reflected in the winning bids, which results in lower proceeds to sellers. The seller's premium, expressed as a percentage

of the hammer price, is negotiable and depends on the quantity and rarity of the wine offered for sale. TCWC does not advertise sellers' commissions, but reasonable estimates range from 15 to 25 percent for wines. Assuming a seller's premium of 25 percent and a hammer price of $100 for a lot of wine, the buyer will pay the auctioneer $100 (plus applicable state and local sale taxes or shipping fees and storage costs), and the seller will receive $75 (less shipping charges, if applicable) from the auctioneer.

An interesting observation in wine auctions is the existence of the declining price anomaly (or the "afternoon effect") documented in both theoretical and empirical research on sequential wine auctions. The anomaly refers to the observation that when identical lots of wine are sold sequentially in a single auction, prices are more likely to decrease with later lots. This declining price anomaly is a violation of the "law of one price," and its existence in wine auction prices was confirmed in several empirical studies including Ashenfelter (1989), Di Vittorio and Ginsburgh (1996), and McAfee and Vincent (1993). Ashenfelter (1989) suggests that the declining price in repeated auctions is due to risk-averse bidders. If the price for the first lot of wine is equal to the later ones plus a risk premium, wine buyers may gain from not bidding too aggressively for early lots of a selected wine, as long as the winning bidder for the first lot of wine does not have the option to take all the other lots at the same price (see Black and De Meza, 1992). McAfee and Vincent (1993) show that for risk aversion to be at the root of the declining price anomaly, bidders must exhibit nondecreasing absolute risk aversion, an attitude that is very unconventional among buyers. More recently, Ginsburgh (1998) shows that there is no anomaly in wine auctions as the price decline is due to absentee bidders who win the first lots using nonoptimal bidding strategies. Finally, Ashta (2006) suggests that there are so many economic, institutional, and behavioral explanations for the observed declining prices in sequential wines auctions that maybe it is not an anomaly at all.

TCWC has been operating in Chicago since 1974 and has been conducting at least one live wine auction every month since 1977 (although the majority of bids are submitted by absentees). The dates on the wine auctions included in this study range from June 27, 1998, to January 21, 2009. The data contains the year and name of the wine, the auction (hammer) price, and the size and quantity of the wine auctioned. There are a total of 615,469 auction observations with 62,006 unique wines by year, name, and condition. We delete any transaction in which the lot size is not "bottle." We also require that each observation has a lot number and that it be associated with an auction date. While the auctions are generally conducted a month apart, in some instances two auctions are associated with the same date. Both pre- and post-period returns are based on the one, two, three, and six months surrounding the wine auction months. For a wine to be included in our sample, it must trade on three dates: the formation or pre-period months, the current month, and the post-period months. For example, for the analysis involving a one month formation or pre-period and two months post-period, a wine has to trade in the previous month

(at time $t-1$), in the current month (at time 0), and two months later (at time $t+2$). Similarly, for the analysis involving two months pre- and post-periods, a wine has to trade two months prior (at time $t-2$), in the current month (at time 0), and two months later (at time $t+2$).

IV. Empirical Results

The results are presented in Table 1. The first column in Table 1 shows the return or change in wine auction prices, X, in the formation or pre-period. In the formation period, there are two return categories for wines with a negative change in prices: a pre-return between 0 and –30 percent (small decrease) and a pre-return of less than −30 percent (large decrease). Similarly, the formation period with positive returns has two return categories: a pre-return between 0 and 30 percent (small increase) and a pre-return of more than 30 percent (large increase). The second column specifies the length of the formation period, one, two, three, or six months, in which the change in wine prices occurred. Therefore, wines may exhibit a small or a large change in prices at auctions in the previous one-, two-, three-, or six-month periods. The fourth column reports the number of observations in the sample, Num, and the average return of the sample in the formation or pre-period is reported in the fifth column. The sixth column shows the average return of the sample in the post-period, and the third column specifies that the length of the post-period can be one, two, three, or six months. Therefore, the first line in Table 1 indicates that 11,468 observations had a small drop ($-30 < X < 0$) in prices the previous month (pre-month 1) with an average returns of −6.55% and realized an average return of 0.97% the next month (post-month 1). In the table significance level for returns are 1% (***), 5% (**), or 10% (*).

The strongest reversals occur for wines that declined in price by more than 30 percent in one month (during a formation period of one month). These wines rise in price by more than 35 percent during the following one-, two-, and three-month periods. More specifically, after a more than 30 percent drop in price in a given month, wine prices rise by 35.46 percent the first subsequent month, by 51.56 percent the first two subsequent months, and by 42.94 percent the first three subsequent months. These returns are both statistically and economically significant for wine investors as bid–ask spreads for wines of about 20 to 30 percent are quite plausible (especially for wine dealers who can negotiate a lower seller's premium). Similarly, after more than a 30 percent drop in price in a given two-month period, wine prices rise by as much as 21.14 percent the next month, by 32.34 percent during the following two-month period, and by 25.88 percent during the following three-month period. For a three-month formation period, wine prices rise by only 10.06 percent the next month and by 12.96 percent during the two-month period following a drop in prices of more than 30 percent. Thus, there are both statistically and economically significant wine price reversals during the three-month period

Table 1
Changes in Wine Auction Price

X = Pre-Return in %	*Pre-Months*	*Post-Months*	*Num*	*Avg Pre-Return in %*	*Avg Post-Return in %*
−30<X<0	1	1	11,468	−6.55***	0.97***
X<−30	1	1	636	−49.85***	35.46***
0>X>30	1	1	8,370	4.33***	−0.55*
X>30	1	1	556	114.25***	−11.03***
−30<X<0	1	2	7,447	−6.01***	−0.40
X<−30	1	2	358	−49.64***	51.56***
0>X> 30	1	2	6,122	4.09***	−0.81***
X>30	1	2	393	110.21***	−12.52***
−30<X<0	1	3	5,558	−5.32***	−0.61*
X<−30	1	3	241	−50.73***	42.94***
0>X>30	1	3	4,585	4.07***	−0.28
X>30	1	3	274	115.96***	−13.67***
−30<X<0	1	6	68	−5.52***	9.52
X<−30	1	6	5	−54.17***	36.44
0>X>30	1	6	92	5.90***	5.11
X>30	1	6	13	97.76***	−36.54***
−30<X<0	2	1	9,946	−7.51***	1.04***
X<−30	2	1	674	−47.73***	21.14***
0>X>30	2	1	6,771	4.44***	−0.87***
X>30	2	1	521	113.60***	−9.59***
−30<X<0	2	2	6,643	−6.87***	−0.51**
X<−30	2	2	376	−47.28***	32.34***
0>X>30	2	2	5,029	4.26***	−0.94***
X>30	2	2	327	124.07***	−11.49***
−30<X<0	2	3	4,836	−6.45***	−0.69**
X<−30	2	3	241	−48.28***	25.88***
0>X>30	2	3	3,678	4.30***	−0.06
X>30	2	3	232	120.47***	−11.40*
−30<X<0	2	6	41	−6.59***	6.70
X<−30	2	6	4	−45.72***	37.40
0>X>30	2	6	43	5.79***	18.11
X>30	2	6	9	76.99***	−10.45
−30<X<0	3	1	8,152	−7.48***	0.96***
X<−30	3	1	729	−45.19***	10.06***
0>X>30	3	1	5,469	4.62***	−0.74***
X>30	3	1	431	112.59***	−8.78***
−30<X<0	3	2	5,177	−7.02***	−0.34
X<−30	3	2	392	−44.52***	12.96**
0>X>30	3	2	3,874	4.49***	−0.32
X>30	3	2	293	114.77***	−13.00***
−30<X<0	3	3	3,779	−6.92***	−0.73**
X<−30	3	3	229	−45.50***	3.24
0>X>30	3	3	2,737	4.42***	−0.18
X>30	3	3	195	100.83***	−11.89***
−30<X<0	3	6	26	−6.56***	7.85
X<−30	3	6	3	−46.13*	57.4
0>X>30	3	6	27	5.13***	20.02
X>30	3	6	7	88.22**	−1.70

−30<X<0	6	1	3,435	−8.12***	0.53***
X<−30	6	1	429	−46.54***	4.58
0>X>30	6	1	2,149	4.85***	−0.61***
X>30	6	1	184	81.91***	−5.86***
−30<X<0	6	2	1,980	−7.65***	−1.74***
X<−30	6	2	221	−44.15***	−1.03
0>X>30	6	2	1,466	4.72***	−0.74**
X>30	6	2	113	72.70***	−8.81***
−30<X<0	6	3	1,323	−7.41***	−2.06***
X<−30	6	3	121	−42.60***	2.30
0>X>30	6	3	963	4.73***	−0.62
X>30	6	3	70	57.67***	−6.66*

following a more than 30 percent price drop in any given one and, possibly, two months.

We find no evidence of momentum in wine auction prices. In fact, statistically significant price reversals also occur after wine prices rise by more than 30 percent. However, results are not economically significant as wine prices decline by about only 12 percent. For example, after a more than 30 percent increase in wine prices in a month, prices decline by 11.03 percent the next month, by 12.52 percent during the following two-month period, and by 13.67 percent during the following three-month period. Similarly, after wine prices increase by more than 30 percent in a two-month period, prices decline by 9.59 percent the next month, by 11.49 percent during the following two-month period, and by 11.4 percent during the following three-month period. Similar price drops take place following a three-month formation period with wine returns of more than 30 percent.

We find no pattern on returns following small drops or small increases in wine prices. That is, after a less than 30 percent change (increase or decrease) in wine prices during a one- or two-month formation period, subsequent returns are small and do not necessarily follow a reversal pattern. Similarly, we do not observe any reversal or momentum effect using six-month pre- and post-periods.

Our results suggest that the most successful investment strategy in wine auctions is to bid at prices at least 30 percent below the previous month's prices. The successful purchases at discounted prices of 30 percent or more are likely to bring returns as high as 35–50 percent, before transaction costs, in the next three months' auctions. Similarly, if wines are not traded or are unsold in the previous month's auction, a strategy of bidding on wines that traded two months ago at a large discount and then trying to sell them in the next three months could generate returns in the range of 20–30 percent before transaction costs. Such returns are likely due to the liquidity premium that sellers seem willing to incur as wines may not sell for several months, especially if high reserve prices are set. However, when wine auctions result in significant price increases, this may be due to herd behavior and

excessive optimism, and wine prices drop by only about 10 percent during the following three months.

V. Conclusion

Several empirical studies support price reversals in stocks. The present study finds that at English auctions of wine, price increases after a month or two of strong price declines are significant during the subsequent one or two months. This study shows that there are economically significant (more than 35 percent) price reversals in wine during the two-month period following a large drop (decline of more than 30 percent) in wine prices during the previous month. The results are, however, weaker for reversals after periods of three and six months of declining wine prices. There is a clear asymmetry in the market reaction to wine price increases and declines. Wine price declines after strong price increases are not, in general, as significant as wine price increases after strong price declines.

References

Ashenfelter, O. (1989). How auctions work for wine and art. *Journal of Economic Perspectives*, 3, 23–36.

Ashta, A. (2006). Win auctions: More explanations for the declining price anomaly. *Journal of Wine Research*, 17, 53–62.

Avramov, D., Chordia, T., and Goyal, A. (2006). Liquidity and autocorrelations in individual stock returns. *Journal of Finance*, 61, 2365–2394.

Ball, R., Kothari, S.P., and Weasley, C.E. (1995). Can we implement research on stock trading rules? *Journal of Portfolio Management*, 21(2), 54–63.

Black, J., and De Meza, D. (1992). Systematic price differences between successive auctions are no anomaly. *Journal of Economic and Management Strategy*, 1, 607–628.

Bremer, M., and Sweeney, R.J. (1991). The reversal of large stock-price decreases. *Journal of Finance*, 46, 747–754.

Conrad, J., Gautam, K., and Nimalendran, M. (1991). Components of short-horizon individual security returns. *Journal of Financial Economics*, 29, 365–384.

Conrad, J.S., Hameed, A., and Niden, C. (1994). Volume and autocovariances in short-horizon individual security returns. *Journal of Finance*, 49, 1305–1329.

Cooper, M. (1999). Filter rules based on price and volume in individual security overreaction. *Review of Financial Studies*, 12, 901–935.

Cox, D.R., and Peterson, D.R. (1994). Stock returns following large one-day declines: Evidence on short-term reversals and longer-term performance. *Journal of Finance*, 49, 255–267.

Di Vittorio, A., and Ginsburgh, V. (1996). Pricing red wines of Medoc vintages from 1949 to 1989 at Christie's auctions. *Journal de la Société Statistique de Paris*, 137, 19–49.

Ginsburgh, V. (1998). Absentee bidders and the declining price anomaly in wine auctions. *Journal of Political Economy*, 106, 1302–1319.

Gutierrez, R.C., and Kelley, E.K. (2008). The long-lasting momentum in weekly returns. *Journal of Finance*, 63, 415–447.
Jegadeesh, N. (1990). Evidence of predictable behavior of security returns. *Journal of Finance*, 45, 881–898.
Jegadeesh, N., and Titman, S. (1995). Short-horizon return reversals and the bid-ask spread. *Journal of Financial Intermediation*, 4, 116–132.
Kaul, G., and Nimalendran, M. (1990). Price reversals: Bid–ask errors or market overreaction? *Journal of Financial Economics*, 28, 67–93.
Lehman, B. (1990). Fads, martingales and market efficiency. *Quarterly Journal of Economics*, 105, 1–28.
Marks, D. (2009). Who pays brokers' commissions? Evidence from fine wine auctions. *Oxford Economic Papers*, 61, 761–775.
McAfee, R., and Vincent, D. (1993). The declining price anomaly. *Journal of Economic Theory*, 60, 191–212.
McInish, T.H., Ding, D.K., Pyun, C.S., and Wongchoti, U. (2008). Short-horizon contrarian and momentum strategies in Asian markets: An integrated analysis. *International Review of Financial Analysis*, 17, 312–329.
Nam, K., Chong, S.P., and Avard, S.L. (2001). Asymmetric reverting behaviour of short-horizon stock returns: An evidence of stock market overreaction. *Journal of Banking & Finance*, 25, 807–824.
Platt, H.D. (2006). Revisiting the reversal of large stock-price declines. *The Journal of Alternative Investments*, 9, 48–63.
Subrahmanyam, A. (2005). Distinguishing between rationales for short-horizon predictability of stock returns. *Financial Review*, 40, 11–35.
Wang, C., and Yu, M. (2004). Trading activity and price reversals in futures markets. *Journal of Banking and Finance*, 28, 1337–1361.
Watkins, B.D. (2006). Institutional ownership and return reversals following short-term return consistency. *Financial Review*, 41, 435–448.
Yalçın, A. (2008). Gradual information diffusion and contrarian strategies. *Quarterly Review of Economics & Finance*, 48, 579–604.
Zawadowski, Á.G., Andor, G., and Kertész, J. (2006). Short-term market reaction after extreme price changes of liquid stocks. *Quantitative Finance*, 6, 283–295.