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Detecting the great short squeeze on Volkswagen

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ABSTRACT

On 28 October 2008 a short squeeze on Volkswagen stock propelled this car maker to become the world's most valuable company for a day. I study the market behavior empirically and investigate whether the timing of the price spike could have been anticipated from earlier trading. I utilize price information from regional stock exchanges in parallel with the primary electronic trading platform Xetra. Although the trading volume on the seven regional exchanges is small, the geographical variation in traded prices shows anomalies when the law of supply and demand begins to overrule the law of one price, and this is observed more than 24 h ahead of the price peak. I find that the coefficient of variation in the prices at the regional exchanges is a leading indicator of the Volkswagen price spike.
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1. Introduction

Financial events are notoriously difficult to predict. Investors and traders seek competitive advantages by analyzing information such as news releases, accounting reports, industry forecasts, technical trends, and quantitative trading behavior. While individual approaches may be as diverse as the market participants, their goal remains the same — to provide useful trading signals ahead of anticipated price movements.

In this paper I study the information surrounding the extraordinary event in Volkswagen stock that occurred on Tuesday 28 October 2008. On this day, while most stock prices were battered by a global financial credit crisis, the price of Volkswagen stock jumped from around €200 to €1000. The cause was insufficient stock available for purchase by traders needing to cover short positions, and for a few hours this German automaker became the most valuable company in the world by market capitalization. While the short sellers who managed to hold on throughout the short squeeze could eventually feel vindicated with Volkswagen trading under € 100 a year later, this is no comfort to those who were forcibly closed out on 28 October. Their losses were massive — estimated to be around six billion euros (Economist, 2008b).

In hindsight it seems irrational that the short interest was so high. More than 12% of the stock had been short sold by October 2008 with an underlying value of around €10 billion. The short-selling of Volkswagen had become a crowded strategy. Several news articles and analyst reports advised of the dangers, and the challenge for traders is to turn such analysis into profits.

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While a trader aware of a potential short squeeze can avoid losses by choosing not to go short, an even better strategy would be to turn the same knowledge into a profitable trade. One possibility is to enter a long position, but that carries uncertainty of when or if the squeeze will eventuate while in the meantime it risks losses from the downward price pressure of short sellers taking the opposite position. The profitability of such a trade depends on the timing of the entry and the exit.

Recognizing the conditions for a short squeeze is one thing. Picking its timing is another. Although fundamental and technical analyses are useful in identifying the forces that may move a price, they are less useful at forecasting the timing. Price movements result from the active trading of market participants rather than their long-term predictions. A statistical approach, quantitative analysis, may be better at identifying the times when market conditions start to change.

Quantitative analysis has intuitive appeal for detecting market shifts because it focuses on the trading empirically. In this study of Volkswagen, I show that a change in trading conditions can be identified on Monday 27 October 2008 a full day ahead of the price spike. Achieving this requires more than the traditional analysis of trade price and volume. The quantitative characteristics of the price and volume show nothing unusual during the squeeze besides the abnormally high price, by which time any trading opportunity has already passed. To gain predictive power I combine trading information from the seven regional stock exchanges around Germany – specifically the price variation among them – information which is more commonly ignored.

Nearly all the trading in Volkswagen stock in Germany – more than 98% of trading volume –takes place on the electronic exchange Xetra. The remaining trading occurs at regional stock exchanges in the cities of Berlin, Frankfurt, Düsseldorf, Hamburg, Hanover, Munich, and Stuttgart. Although the volume of trading at these seven regional bourses may seem statistically insignificant (and indeed the location of trade can be ignored for most purposes) I use this information to build an indicator of deteriorating market health. The idea comes from the "law of one price" — the proposition that identical goods should trade at the same price. Under normal circumstances, the price of Volkswagen shares should be the same in each city, and indeed for most of the time this is confirmed empirically. This rule however can break down when limits to arbitrage arise such as reduced stock availability in the extreme market conditions of a short squeeze. During these times, the law of supply and demand can overrule the law of one price.

By measuring the coefficient of variation in Volkswagen stock prices between the seven exchanges in 15-minute intervals, I find that abnormal trading conditions can be detected by 10 am on the day before the price spike. This warning could give traders a significant time advantage. Those with short positions may be able to exit while the Volkswagen was trading at €350, perhaps saving them from being closed out the next day as the price headed towards €1000. Speculators could profit by purchasing out-of-the-money call options, which means paying a relatively low premium for a chance of a much larger payoff. Compared with fundamental and technical analysis, this quantitative analysis is fast and can put traders ahead of others who need time to process news and fundamentals. It may even be possible to profit by trading on the abnormal conditions in a stock without knowing what has triggered them.

The following sections review the conditions for the Volkswagen short squeeze, examine warnings from news and technical analysis, then develop a quantitative measure of price variation which can identify the onset of the squeeze empirically.

2. The Volkswagen Short Squeeze

A short squeeze occurs when short sellers race to repurchase a stock to close their positions, and their buying pressure in turn triggers more short sellers to close out. In manipulated markets a short squeeze can arise in many ways (Merrick et al., 2005) but the risk with Volkswagen may have seemed low because of the firm's large size and high liquidity (Elfakhani, 2000). In reality the event on Volkswagen in 2008 was a "perfect" or "infinite" squeeze because there was less stock in free float than needed to close out all the short seller's obligations. The short sellers could not have repurchased at any price.

The Volkswagen short squeeze of 2008 arose after rival car manufacturer Porsche had built an interest of 74.1% in the company including an undisclosed holding of 31.5% in cash-settled options. Porsche had earlier declared a milestone holding of 30% as required by German takeover law, and the next update was not required until reaching 50%. Meanwhile the option position did not require disclosure at all under German law because settlement by cash would not provide stock and therefore not provide control of the company. Delaying the disclosure of insider trades tends to increase the profit opportunity of such trades (Etebari et al., 2004) and this was no doubt part of the Porsche's strategy. Nonetheless, although Porsche could build its holding quietly, the options purchases would still cause observable upward pressure on the stock price because Porsche's counterparties would need to hedge their written positions by buying the underlying stock.

Porsche's counterparties found they could reduce their hedging costs by lending their Volkswagen shares for short-sale. They could earn a lending fee each time they lent out a share, and meanwhile the same share could be repurchased on the market by themselves or another counterparty, or perhaps even by Porsche. They were incentivized to encourage short selling and they had plenty of stock to lend, inverting the more common situation where demand for short selling outstrips supply (Asquith et al., 2005). Without disclosing their intent to repurchase the stock, this action would have biased the market for short selling (the typical market for borrowing stock is described by D'Avolio (2002)). It introduced a cycle where the same share could be purchased then be lent for short sale again as if it were untainted (Murphy, 2008), and this enabled Porsche's counterparties to acquire their stake in Volkswagen more cheaply and quickly than otherwise possible.

Porsche declared its interests on Sunday 26 October 2008 in a voluntary news release. By that time, there was perhaps only 5.7% in free float due to Porsche's holding of 42.6%, Porsche's counterparties' hedge of up to 31.5%, and a 20.2% protective stake held by the State of Lower Saxony (Ehrhardt, 2007). At the same time, the short interest in Volkswagen had grown to around 12.9% of the stock (de la Merced and Dougherty, 2008). The short-sellers were in an infinite squeeze.

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