The Ups and Downs of Wirecard AG: An Application of the Reversed News Model

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Abstract

In early 2019, the stock prices of the German company Wirecard AG experienced market turmoil after several critical reports on activities claimed to be illegal. To analyze the market impact of news, we use stock price data for Wirecard AG and apply the *reversed* news model. We elaborate on whether new information can explain subsequent changes in the stock price. We find that articles published in the *Financial Times* as well as *investor communications* were important drivers of the stock price.

JEL classification: D82; G14; G32
Keywords: News Model; Stock Market Efficiency; Event Study

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1 Introduction

In September 2018, the German fintech company *"Wirecard AG"* replaced Commerzbank AG in the DAX 30 stock market index, cf. Storbeck (2018).[1] Wirecard is therefore considered one of the few success stories in the German fintech sector. However, in the beginning of 2019, several articles published by the *Financial Times* questioned whether Wirecard's subsidiary operations in Singapore engaged in forgery and falsification of accounts and documents, cf. McCrum and Palma (2019d). Had this turned out to be true, a strong markdown in the company's value would have been justified. Even the bare rumor of such illegal behavior can create uncertainty among investors and declining stock prices.

It is a central assumption of the *news model* that agents collect every piece of publicly available information and incorporate this information into their asset price expectations. This leads to a scenario where asset prices are efficient in a semi-strong sense as defined by Fama (1970). As a consequence, changes in asset prices are the outcome of the appearance of new, non-expected information that was not considered in asset prices so far. Frequently, this information is called a *signal* with respect to the fundamental value of an asset.

In this article, we apply a *reversed* news model to Wirecard daily returns. The reversed news model observes strong market reactions (that is, strong absolute changes in stock prices compared to a market reference, in this case, the DAX 30) and afterward identifies possible news-related drivers of these changes. Using this, it can be shown whether the investigated underlying is inferred by news and if so, which types of news are strongly influential.

A central finding of this paper is that newspaper articles concerning the allegedly illegal behavior of Wirecard indeed influenced the company's stock price in a negative way. However, press releases and ad-hoc news of Wirecard tried to correct the public opinion and influenced stock prices in a positive way. This emphasizes the importance of investor communication.

[1] In early 2019, Wirecard's market capitalization was even larger than that of Deutsche Bank, Germany's largest commercial bank: Deutsche Bank's free float amounted to around 2 bn. stocks. Given a stock price around 7 € yielded a market capitalization of around 14 bn. €, while Wirecard's free float was little more than 123 m. pieces. Given a stock price of around 130 €, this yielded around 16 bn. € in market capitalization.

The remainder of this article is organized as follows: Section 2 briefly explains the reversed news model. Section 3 discusses the data set and the empirical findings. Section 4 gives an overview of the identified events and Section 5 concludes.

2 The Reversed News Model

Empirical studies that apply the news model of asset price determination traditionally follow this procedure: In a first step, a theoretical model is derived that identifies the different news categories which are assumed to drive asset prices. In the second step, the influence of the different news categories on the asset price is quantified empirically.

In contrast to that, the *reversed* news model as presented by Fisher Ellison and Mullin (2001) changes the order of these steps and provides an alternative approach: In the *first* step, large stock price movements are disentangled from the prevailing market environment. In a *second* step, it is checked whether company specific information can be identified which might have caused the stock price reactions. Stock price shocks may be caused by company specific events, but also by overall events such as, e.g., reported business cycle predictions, regulations, political developments or disasters. Thus, it is important to control for the market into which the investigated underlying is embedded. For Wirecard, this manifests in controlling for DAX 30 developments. The procedure is carried out by regressing Wirecard daily returns on DAX 30 daily returns and then investigating only the innovations.

As a consequence, large (absolute) spikes in the time series development of innovations can be identified. It is then up to the researcher to identify the driving events behind these spikes, that is, the corresponding news. In contrast to the traditional approach, the reversed news model identifies *first* large stock price reactions which cannot be explained by overall stock market conditions. In this article, we categorize the identified news as *external* or *internal* by differentiating whether the respective news stem from external press reports or from the company itself, e.g. in terms of an ad hoc news release.

Gerrard and Lossius (2004) use the reversed news model to analyze publicly

listed English football teams. They argue that the reversed news model is a proper method to circumvent some pitfalls of traditional event studies, such as the problem of choosing the appropriate length of the event window. More recently, and also in the research field of sports economics, Croonenbroeck et al. (2015) apply the reversed news model to identify the relevant stock price influencing news to Danish football club Brøndby. They find that match results, but also news related to corporate governance and financial status influence the stock prices.

3 Empirical Analysis

The time period under investigation runs from Sept. 3rd, 2018 to Sept. 11th, 2019.[2] All stock prices are daily closing prices. In order to control for overall stock market effects, we incorporate daily DAX 30 data. Figure 1 presents the time series of Wirecard and DAX 30.

We regress Wirecard's daily returns, r_{Wire}, on a constant α and the DAX 30 daily returns, $r_{\text{DAX 30}}$:

$$r_{\text{Wire}} = \alpha + \beta \cdot r_{\text{DAX 30}} + \varepsilon. \tag{1}$$

The results are as follows (t-values in parentheses):

$$\hat{r}_{\text{Wire}} = -0.001 \ (-0.38) + 1.83^{***} \ (6.89) \cdot r_{\text{DAX 30}} \tag{2}$$

at an adjusted R^2 of 0.1535. We sort the innovations according to their *absolute* value, $|\hat{\varepsilon}|$, in a descending order. In Table 1 we present the ten largest absolute innovations. For each date identified due to absolute innovations, we research company specific news that may have caused the unexplained reaction in stock prices. Note, however, that for innovation No. 7 no news can be identified. The strong stock price reduction on that day could be due to high overall volatility during the first days after entering DAX 30 index. Table 1 highlights that

- the release of several articles in the *Financial Times* as well as
- the reactions of *Wirecard AG*

[2] We opted for Sept. 2018 as the starting point because Wirecard AG entered the DAX 30 index on Sept. 24th, 2018, cf. Storbeck (2018).

influenced Wirecard's stock market prices. All news concerning allegations against Wirecard, in fact, led to stock price declines (negative innovations). All news releasing pressure, however, resulted in positive innovations (increasing stock prices).

To sum up, by applying the reversed news model we are able to show that *not only* the Financial Times articles *but also* the reactions of Wirecard information are important drivers of the stock market price. In the next section, we give some more details with respect to the identified news.

4 The Sequence of Events

We briefly elaborate on the events identified. In contrast to Table 1, the time line is discussed in chronological order. For reference, however, numbers link events to entries in the table which are sorted by the respective innovations' magnitudes.

- October 8, 2018: No news identified, possibly turmoil few days after entering DAX 30 notation. (8)
- January 30, 2019: Financial Times releases first article containing reports on forgery and money laundering. The so-called "Zattara" report is referenced. Wirecard immediately disclaims and raises suspicion of systematic short selling. (4)
- February 1, 2019: The next Financial Times article claims to have "proof of serious felonies". (1)
- February 4, 2019: Wirecard CEO Markus Braun claims that there is no proof for any of the allegations, that he does not expect further critical Financial Times articles and that Wirecard will now "return to business". (5)
- February 7, 2019: Financial Times provides details on allegedly committed actions of Wirecard Singapore, especially dealing with license fraud. (7)
- February 8, 2019: Financial Times and also other media report claim about a police raid at Wirecard Singapore headquarters. (6)

- February 18, 2019: The German Federal Financial Supervisory Authority (BaFin) bans short selling of Wirecard shares for the upcoming 2 months. (3)
- March 15, 2019: Financial Times reports that Wirecard India is under investigation by public prosecution for fraud. (9)
- March 26, 2019: Wirecard AG publishes ad hoc news claiming that an external investigation reveals no criminal actions whatsoever. (2)
- March 29, 2019: Another Financial Times article claims police investigations of Wirecard Singapore. (10)

Finally, we run another regression containing ten impulse dummies for each of the identified ten largest (absolute) innovations in addition to specification (1):

$$\hat{r}_{\text{Wire}} = 0.001\ (0.57) + 1.54^{***}\ (8.43) \cdot r_{\text{DAX 30}} + \hat{\gamma}_1 dum_1 + \ldots + \hat{\gamma}_{10} dum_{10}. \quad (3)$$

This robustness check shows that the parameters for intercept and slope are stable. All coefficients for the dummy variables are significantly different from zero (not presented here, estimates are almost identical to the values presented in Table 1). The adjusted R^2 increases from 0.1535 to the value of 0.6271. Hence, we indeed identified those *news* which drove the stock price under the time period of investigation.

5 Conclusion

We apply the reversed news model to identify those events that had a major impact on the stock price of Wirecard in 2018/2019. We find that several Financial Times articles led to strong stock price declines and ad hoc news by Wirecard itself resulted in positive daily returns. While Wirecard public relations did not make severe mistakes in public communications, we recommend that any public company reacts to allegations such as those raised by Financial Times with a maximum of transparency to attain as much credibility as possible.

One disadvantage of the reversed news model can be seen in the fact that

the model is not able to detect news categories. This is up to the researcher. Also, as the reversed news model focuses on large absolute innovations it is not able to detect news that have a significant, but only small impact on stock prices. This, however, could be overcome by piecewise linear regressions analyzing the degree of statistical significance for each piece or by explaining the innovations in a second-step OLS model using relevant instruments. Additional methodological research has to be carried out.

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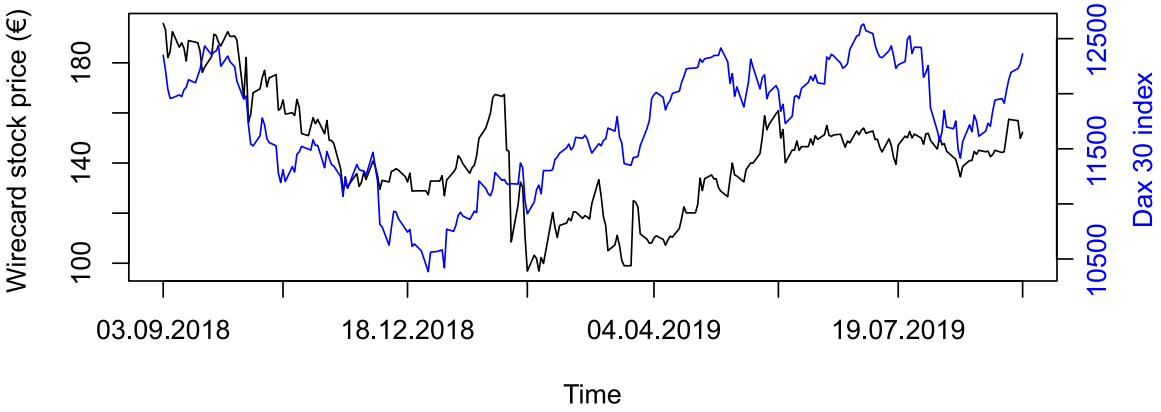

Figure 1: Time series data of Wirecard stock prices and DAX 30 index data, time frame Sept. 3rd, 2018 to Sept. 11th, 2019.

No.	Innovation	Date	Event	Category
1	-28.8 %	February 1, 2019	Second Financial Times article (McCrum and Palma, 2019d)	External
2	22.2 %	March 26, 2019	Ad hoc news (Wirecard AG, 2019)	Internal
3	14.2 %	February 18, 2019	German regulator bans short selling (BaFin, 2019 and McCrum and Chazan, 2019)	External
4	-13.6 %	January 30, 2019	First Financial Times article (McCrum and Palma, 2019a)	External
5	13.0 %	February 4, 2019	Wirecard CEO considers "the whole issue resolved" (Storbeck and Palma, 2019)	Internal
6	-11.4 %	February 8, 2019	Fourth Financial Times article (Palma and McCrum, 2019)	External
7	-11.2 %	February 7, 2019	Third Financial Times article (McCrum and Palma, 2019c)	External
8	-11.1 %	October 10, 2018	NA	NA
9	-10.6 %	March 15, 2019	India investigations after FT reports (McCrum and Palma, 2019b)	External
10	-10.6 %	March 29, 2019	Sixth Financial Times article (McCrum and Palma, 2019e)	External

Table 1: Results of the reversed news model.

Note: Price reaction of Wirecard stocks not explained by overall market reaction. "NA": No news identified. "External": News created by external parties, especially newspapers. "Internal": Ad hoc news, press releases by the company.