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Co-Author/s

<table>
<thead>
<tr>
<th>Name</th>
<th>E-Mail</th>
<th>Affiliation</th>
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<tbody>
<tr>
<td>Marcin Czupryna</td>
<td><a href="mailto:czupryn@uek.krakow.pl">czupryn@uek.krakow.pl</a></td>
<td>Cracow University of Economics, Department of Financial Markets</td>
</tr>
</tbody>
</table>

Keywords
information dissemination, digital communication, social media, wine prices, market liquidity

Research Question
How the information disseminated through digital communication channels and social media influences wine price behaviour and market liquidity?
Are any textual regularities in disclosed phrases and messages?

Methods
text mining techniques, count based analysis, association analysis, similarity and dissimilarity analysis, event study methodology

Results
Our current results confirm hypothesis H2 and partially confirm hypothesis H1 (based on volume-based and transaction cost-based liquidity measures)

Abstract
1. Introduction
Fast expansion of digital communication and social media in recent years has created new possibilities and challenges for information dissemination on products or services of all markets and industries. Various interactive platforms, blogs, forums or messengers with user-generated content serve not only for entertainment and socializing purposes, but more often find use in business as professional communication channels between potential buyers and sellers. Firms implement advanced web- and mobile-based technologies and applications to attract a wide audience of customers and stakeholders and to generate website traffic, and thus product interest. According to Statista – an online portal for market data and research - among the most popular platforms used by marketers to market their business (as of January 2016) are Facebook (used by 93% of respondents), Twitter (76%), LinkedIn (67%) and YouTube (53%). It should not be surprising taking into account the fact that only in the case of Facebook the number of subscribed followers exceeds 1,7 billion of users worldwide (Statista 2016).
A wine is a kind of product eminently susceptible to be marketed through digital communication channels and social media platforms. First, the market is highly fragmented with participants scattered all over the world. Second, there is a wide community of wine enthusiasts and hobbyists who are interested in viticulture and wine making, relish in the wine lifestyle and want to have the permanent access to current news and updated information on events and products from preferred wine regions. Third, wine is suitable for online sales, which makes social media an attractive space to place direct links to official websites, online stores or wine auctions. An example of use of different interactive communication channels in wine business is presented in table 1 (see...
2. Research objectives and hypotheses
The main goal of our research is to investigate the economic value of digital communication and social media use by firms in the wine market by examining how the information disseminated through selected platforms influences wine price behaviour and market liquidity. Supplementary, an in-depth analysis of information contents disclosed at different commercial and non-commercial websites and platforms should help to verify the existence of some textual regularities in disclosed phrases and messages and to reveal their links to wine price movements and changes in liquidity.
Based on observations from financial markets and adapting them to a specificity of the wine market we postulate that:
H1: Information dissemination through digital communication channels (including social media) improves wine pricing efficiency and wine market liquidity
H2: Information style depends on the sales channel (wine exchange, auction house, wholesaler, retailer)

3. Related literature
Although research on information disclosure and dissemination, as well as its incorporation into asset prices has been extensively documented in the literature (e.g. Fama 1970, Hasbrouck 1995, Tang 2014, Twedt 2016), the
dynamic development of digital communication and social media over last decade and their broad and effective implementation into business has shed new light on this problem and initiated increasing research activity. The core issue boils down to verification if distribution of information through digital communication channels improves market efficiency and diminishes information asymmetry between market participants. The analyses are based mainly on data coming from search engine queries, web news, information published at companies’ official websites and social media – the latter two are of our main consideration in this paper.
In this context, Blankespoor, Miller and White (2014) examine the use of Twitter in IT companies and confirm its positive impact on liquidity (lower bid-ask spreads, greater depths and a higher liquidity ratio), consistent with reduction of information asymmetry. Ranko et al. (2015) confirm statistically significant dependence between Twitter sentiment and DJIA stock price returns and Azur and Lo (2016) indicate that the content of tweets can be used for returns prediction. For publicly traded companies the information disclosure and dissemination is a more complex issue as it requires to be in compliance with organizational and legal restrictions imposed by regulators. Beyer et al. (2010) provide an extensive literature review on corporate financial reporting environment in capital market setting. Correspondingly, Qu et al. (2017) examine the influence of SEC policy on Fair Disclosure of corporate information in social media and reveal that news released by S&P 500 firms via Twitter translate into significant spread tightening and trading volume increase.

The question of how social media influences the wine industry and wine consumer behaviour is examined from different viewpoints with apparent emphasis on marketing- and sociology-related concerns (e.g. Fiore et al. 2016, Cuomo et al. 2016, Hoffman et al. 2014). Study of Forbes et al. (2015) confirms a dominant role of Facebook and Twitter as the most adopted social media platforms utilized by wineries in Australia and New Zealand with level of adoption reaching 65%. In turn, Kolb and Thach (2016) reveal quite low level of adoption of Web 2.0 and social media (27%) by German wineries. There is a lack of thorough research on connections between information dissemination and wine pricing and market liquidity. Our study adds to current knowledge regarding the use of digital communication and social media in the wine industry, as well as contributing to a nascent literature on information dissemination and wine market microstructure.

4. Methodology and data
We examine the information dissemination via digital communication channels and social media used by selected entities involved into wine trading and/or having impact on wine prices, as Liv-ex exchange, auction houses (e.g. Christie’s wine department), wholesalers (e.g. Southern Glazer’s Wine & Spirits), WineSpectator, WineSearcher etc. We apply the standard text mining techniques (e.g. Feinerer and Hornik 2015, Feinerer, Hornik and Meyer 2008). In particular the wine related information is read into R environment, preprocessed (stemming, white space elimination, lower case conversion, synonyms replacement) and tagged (each word is classified as noun, verb, adjective, etc.). We than do the count based analysis (to identify the “emotional” content of the text), association analysis (to identify the words related to or associated with “wine”). Furthermore, the similarity and dissimilarity analysis based on defined distance measures as cosine but also more advanced as Extended Jaccard Similarity (Strehl, Ghosh and Mooney 2000) is conducted to identify the similarity among news from one source and the
dissimilarity among news from different sources. We also apply event study methodology (e.g. Campbell., Lo, MacKinlay 1996) to examine how different news (content and style) influence the wine prices. We extend our analysis by exploring bid-ask spreads (actually differences between best ask and bid prices due to limited data) to investigate their impact on wine market liquidity.

5. Results
Our current results confirm hypothesis H2 and partially confirm hypothesis H1 (based on volume-based and transaction cost-based liquidity measures).

6. Bibliography
15) Statista (2016), Which social media platform(s) do you use to market your business?, www.statista.com (downloaded at 12-12-2016)

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Cracow University of Economics
Department of Financial Markets

Marcin Czupryna, Paweł Oleksy

Information matters: how does digital communication and social media affect liquidity and price behaviour in the wine market

Key words: information dissemination, digital communication, social media, wine prices, market liquidity

1. Introduction

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makes social media an attractive space to place direct links to official websites, online stores or wine auctions.

An example of use of different interactive communication channels in wine business is presented in table 1.

Table 1. Use of selected social media communication channels in selected wine business entities (as at 12.12.2016)

<table>
<thead>
<tr>
<th></th>
<th>Liv-ex</th>
<th>Wine-searcher</th>
<th>Wine Spectator</th>
<th>Christie's Wine</th>
</tr>
</thead>
<tbody>
<tr>
<td>blog</td>
<td>YES</td>
<td>NO</td>
<td>YES*</td>
<td>NO</td>
</tr>
<tr>
<td>Facebook</td>
<td>YES (4 539 people like this and 4 310 people follow this)</td>
<td>YES (105 037 people like this and 90 839 people follow this)</td>
<td>YES (260 511 people like this and 250 493 people follow this)</td>
<td>YES** (170 932 people like this and 167 534 people follow this)</td>
</tr>
<tr>
<td>Tweeter</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td></td>
<td>• Tweets: 6 902</td>
<td>• Tweets 7 346</td>
<td>• Tweets 15,5 thous.</td>
<td>• Tweets: 1 245</td>
</tr>
<tr>
<td></td>
<td>• Following: 795</td>
<td>• Following: 1 350</td>
<td>• Following: 25</td>
<td>• Following: 515</td>
</tr>
<tr>
<td></td>
<td>• Followers: 7 373</td>
<td>• Followers: 224 thous.</td>
<td>• Followers: 1 137</td>
<td>• Followers: 3406</td>
</tr>
<tr>
<td></td>
<td>• Likes: 2 193</td>
<td>• Likes: 286</td>
<td>• Likes: 1 137</td>
<td>• Likes: 889</td>
</tr>
<tr>
<td></td>
<td>• Lists: 2</td>
<td></td>
<td>• Lists 5</td>
<td></td>
</tr>
<tr>
<td>LinkedIn</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>YES**</td>
</tr>
<tr>
<td></td>
<td>• Followers: 1 222</td>
<td></td>
<td>• Followers: 2 645</td>
<td>• Followers: 62 820</td>
</tr>
<tr>
<td>Instagram</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td></td>
<td>• Posts: 25</td>
<td>• Posts: 649</td>
<td>• Posts: 391</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Followers: 2 821</td>
<td>• Followers: 134 thous.</td>
<td>• Followers: 3732</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Following: 1 110</td>
<td>• Following: 29</td>
<td>• Following: 460</td>
<td></td>
</tr>
<tr>
<td>Pinterest</td>
<td>NO</td>
<td>NO</td>
<td>YES</td>
<td>YES**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Followers: 7 178</td>
<td>• Followers: 39 830</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Following: 2</td>
<td>• Following: 267</td>
<td></td>
</tr>
</tbody>
</table>

*) several blogs integrated into official website **) included in company’s main fanpage/profile

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