Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
The value of reputation capital during the COVID-19 crisis: Evidence from Japan

Tomonori Manabe a,*, Kei Nakagawa b

a Sansan, Inc., Aoyama Oval Building 13F, 5-52-2 Jingumae, Shibuya-ku, Tokyo, 150-0001, Japan
b Nomura Asset Management Co., Ltd., 2-2-1, Toyosu, Koto-ku, Tokyo 135-0061, Japan

A R T I C L E I N F O

Keywords: Crash risk Corporate reputation COVID-19 Reputation capital Stakeholder

A B S T R A C T

This study investigates the value of reputation capital with regard to the stock market crash in the early stages of the COVID-19 pandemic. At that time, when stock prices fell precipitously, firms with a positive reputation for the usefulness of products/services seen from within their business network showed stock returns five to seven percentage points higher than firms with a low reputation score. This suggests a positive reputation among stakeholders can serve as insurance against shocks in times of crisis. Notably, results suggest firms that can build public trust owing to the usefulness of the product/service are more resilient from crash caused by real economic damage, as occurred with the COVID-19-related crash.

1. Introduction

Corporate reputation (CR), which represents the knowledge and sentiment that stakeholders hold about a company, can lead to long-term benefits and sustainable growth for a company (Hall, 1992; Podolny and Phillips, 1996; Waddock and Graves, 1997; Walker, 2010). Positive CR helps in better sustaining strong profit outcomes over time (Roberts and Dowling, 2002). Recent studies have also shown that corporate social responsibility (CSR), a known factor in CR (Yadav et al., 2018), reduces the risk of stock price plunges (Kim et al., 2014; Lins et al., 2017). Consequently, CR, which is associated with alleviating crash risk that cannot be mitigated by portfolio diversification (Sunder, 2010), is a potentially useful indicator not only for corporate management but also for investors pursuing risk management (Kim et al., 2014).

That notwithstanding, the relationship between CR indicators based on more direct stakeholder evaluations rather than alternative indicators and the risk of stock price crashes has yet to be examined. In particular, the relationship with reputation’s specific components remains unclear. Moreover, it is unclear whether CR can mitigate the shocks caused by damage to the real economy rather than a financial crisis.

In this study, we examined whether positive CR mitigated the stock price crash triggered by the COVID-19 pandemic’s emergence in January–February 2020 (hereinafter the “coronavirus shock”). The background of the coronavirus shock differs from that of previous plunges, such as the global financial crisis, which was mainly caused by concerns about the financial system (Afonso et al., 2011). With the coronavirus shock, the crash in stock prices was caused by concerns about the real economy’s supply-side, i.e., declines in factories’ production capacity and disruption of supply chains and transportation networks (Baldwin and Di Mauro, 2020). It is still unclear whether CR can mitigate the shocks caused by damage to the real economy rather than the credit economy. Furthermore, in the current situation in which the risk of a similar crash persists, it is important for risk management to evaluate whether reputable firms have a lower crash risk.

* Corresponding author.

E-mail addresses: tom.manabe@gmail.com (T. Manabe), kei.nak.0315@gmail.com (K. Nakagawa).

URLs: https://en.sansan-dsoc.com/ (T. Manabe), https://global.nomura-am.co.jp/ (K. Nakagawa).

https://doi.org/10.1016/j.frl.2021.102370

Received 16 May 2021; Received in revised form 3 August 2021; Accepted 8 August 2021

Available online 17 August 2021

1544-6123/© 2021 Elsevier Inc. All rights reserved.
To answer the question, we used a novel CR measurement based on direct evaluations from external stakeholders of the company. In relation to this approach, previous research demonstrated the relevance of CR’s value via third-party evaluations or alternative indicators of CR (Deephouse, 2000; Black et al., 2000; Roberts and Dowling, 2002). Considering the definition of CR (Brown et al., 2006), however, a direct survey of stakeholders may be the most appropriate means of measurement. In this study, we use the Eight Company Score (ECS), released by Sansan, Inc. (Tokyo, Japan) in 2018, as a CR measurement. We examine the impact of the ECS with regard to the coronavirus shock-related stock price declines. Sansan, Inc. conducts a random large-scale survey questionnaire to users via the business card management app Eight (Sansan, Inc., Tokyo, Japan) and builds the ECS based on the results. The ECS measures the perception of the firm maintained by holders of that firm’s business cards.

Business card holders are a broad group of stakeholders who possess business relationships with a company. They include suppliers, business-to-business (B2B) buyers and sellers, collaborators, and people in the same business community. Internal stakeholders, however, such as employees and managers, and stakeholders such as shareholders and local communities, would not be included in this survey. A business card holder’s perception of a company can thus be regarded as that of an external stakeholder in the company’s business network, and the aggregate of these perceptions is the CR of the firm in the business network.

Manabe and Nakagawa recently demonstrated that firms with high ECS have a high return on assets (ROA) (Manabe et al., 2020). The present study uses this index to examine whether companies with a positive CR among external stakeholders had a mitigated stock decline in relation to the spread of the novel coronavirus.

Additionally, studies often have used aggregated levels of CR scores; however, the composition of reputation related to performance can be expected to vary depending on the situation. Here, we provide practical suggestions for reputation management by clarifying the relationship between specific characteristics (i.e., brand, service, person) of reputation and the coronavirus shock.

2. Dataset

2.1. Eight Company Score (ECS)

The ECS is created by randomly sending a questionnaire survey to those selected from among 2.5 million users (mainly in Japan) of the Eight business card management app and then compiling the response results. Survey response is voluntary, and all personal information of the respondents is anonymized. The survey is conducted biannually, in April and October. Table 1 shows the number of surveyed firms and respondents in the October 2019 survey. The survey covers Japanese 1,402 firms and is based on responses from 196 business card holders per firm, on average.

The questionnaire requests rating of four items – Brand, Service, People, and Recognition – in addition to free comments about the subject company. Respondents are asked to rank responses to the following four questions on an 11-point scale (scored 0–10).

1. **Brand:** “Do you think this firm’s brand image is attractive?”
2. **Service:** “Do you think that this firm’s products or services are useful to your company or society?”
3. **People:** “Do you think people at this firm give a good impression?”
4. **Recognition:** “How much do you know about this firm?”

Three firms selected by the survey company comprise the number of surveyed firms per respondent.

2.2. Sample and summary statistics

We used the most recent ECS data (October 2019) from before the coronavirus shock. To clarify the role of issue-specific reputation, we did not integrate the ECS scores, but rather we used Brand, Service, and People as individual variables. The Recognition score represents the respondents’ knowledge of the company, with a low score suggesting their confidence in rating other items is also low. We then defined the ECS score for item \( k \) (i.e., Brand, Service, or People) for firm \( i \) as the “corporate knowledge rating weighted mean” of the respondents’ ratings for firm \( i \) (Eq. (1)) to add the respondent’s confidence as a weight. By this definition, respondents who have a corporate recognition rating of 0, which means the respondent knows nothing about the firm, are excluded.

\[
ECS_{ik} = \frac{\sum_{j=1}^{n_i} \text{Recognition}_{ij} \cdot \text{Rating}_{ijk}}{\sum_{j=1}^{n_i} \text{Recognition}_{ij}}
\]  

(1)
where \( n_i \) is the number of respondents regarding firm \( i \), \( Recognition_{ij} \) is the knowledge rating of respondent \( j \) for firm \( i \), and \( Rating_{ijk} \) is the rating of respondent \( j \) for item \( k \) of firm \( i \).

The monthly rate of return, including dividends and financial information data, was acquired by Nomura Research Institute's Analytical Data Service (IDSQE). Fama–French factor returns data were acquired from the website of French (2021). As of October 2019, there were 812 listed companies among the companies surveyed for the ECS, of which 806 had no missing data among all the data on stock prices and financial control variables. The data set for those 806 companies were used for the analysis.

Idiosyncratic returns are estimated using the market model:

\[
r_{i,t} = \alpha_i + \beta_i R_{M} R_{F,t} + \epsilon_{i,t}
\]

where \( r_{i,t} \) represents the return on stock \( i \) in month \( t \) of the risk-free rate, \( R_{M} R_{F,t} \) is the market factor excess return of the risk-free rate for the market in month \( t \). \( \alpha_i \) and \( \beta_i \) are parameters to be estimated, and \( \epsilon_{i,t} \) is the idiosyncratic return of stock \( i \) in month \( t \). The parameters were estimated using data for 60 months up to January 2020.

Stock returns and idiosyncratic returns during the coronavirus shock were defined as the averages in February–March 2020. The average stock return during this period was \(-9.24\%\), and the average idiosyncratic return was \(-1.83\%\).

We used the same control variables as used in Lins et al. (2017) – cash holding ratio (CH; cash and securities to total assets), short-term debt ratio (STD; current liabilities to total assets), long-term debt ratio (LTD; fixed liabilities to total assets), and profit ratio (PR; operating income to total assets) – as indicators of financial soundness that may affect stock prices during a crisis. We also controlled for logarithm of company size (SIZE), book-value to market ratio (BM), the dummy variables of negative BM (NBM), momentum (MOM; cumulative stock price return for the previous 12 months excluding the last month), and idiosyncratic risk (IR) calculated as the standard deviation of the residual returns from the market model Eq. (2).

Table 2 shows the summary statistics of these variables and Table 3 shows the correlations among the variables.

We also introduced factor loadings in the Carhart four-factor model (Carhart, 1997) to control the impact of exposure on the factors of returns and a dummy variable of 33 industries (Securities Identification Code Committee, 2018) to control industry-specific impact.

We winsorized all performance variables at the 1st and 99th percentiles to avoid problems with extreme observations.
3. Results

3.1. Corporate reputation in the coronavirus shock

We used a multiple regression model, as shown in the following equation (3), to estimate each variable’s effect with regard to the coronavirus shock.

\[
R_i = \beta_0 + \beta_1 ECS_i + \beta_2 CONTROL_i + \beta_3 FactorLoadings_i + IndustryDummy + \epsilon_i
\]

Here, \( R_i \) represents the return (or idiosyncratic return) of company \( i \) during the coronavirus shock period. \( \beta_0 \) is the intercept term and \( \beta_1, \beta_2, \beta_3 \) are the coefficient vectors. \( ECS_i \) represents the ESC score vector of company \( i \). \(^1\) \( CONTROL_i \) is the control variable vector of company \( i \), described in the previous section. \( FactorLoadings_i \) is the Carhart factor loadings vector for company \( i \), IndustryDummy is the industry dummy variable, and \( \epsilon_i \) is the error term.

Table 4 shows regression-estimates of the model (3). The standard errors are computed using the heteroskedasticity-robust method (White, 1980). We examined variance inflation factor (VIF) analysis for all coefficients in all of our models to quantify the severity of multicollinearity effects. None of the variables generated a \( VIF > 5 \), which is well below the acceptable threshold of 10.

In all models, the ECS Service showed a strong positive association with (idiosyncratic) returns, indicating that companies with a high ECS Service rating suppressed the effects of the coronavirus shock. The model results with control variables showed that an increase of one standard deviation (SD) in the ECS Service in November 2020 was associated with an increase of 1.63% in return and 1.27% in idiosyncratic return during the coronavirus shock.

Although the partial regression coefficients’ absolute values were small and less robust, the ECS Brand score’s coefficients were negative, showing a negative association with returns. These results indicate the market valuation became lower for firms with greater brand reputability than those with greater product reputability during the coronavirus shock. It should be noted, however, that the Brand and Service scores are strongly correlated \((r = 0.86)\); firms have similar values for both scores. Considering this correlation, we interpret that firms whose brands were rated relatively higher than their products/services – i.e., brand-dominant firms – had lowered market values during the coronavirus shock. In contrast, firms whose substantial reputation for products/services more strongly exceeded the value predicted by the brand – i.e., product utility-dominant firms – had higher returns.

3.2. Portfolio performance through ECS service

To clarify the relationship between ECS Service and return, we divided firms into ECS Service quartiles and include dummies for quartiles in model (4).

\[
R_i = \beta_0 + \beta_1 ServiceScoreDummy_i + \beta_2 CONTROL_i + \beta_3 FactorLoadings_i + IndustryDummy + \epsilon_i
\]

Table 5 shows the results. In all models with and without controls, the top-25% portfolio based on the ECS Service shows a statistically significant positive coefficient, indicating a high expected return. We can also confirm that the ECS Service dummy coefficients gradually increase as the ECS Service quartiles increase. The model’s estimation with controls shows the differences in returns between firms in the highest (top 25%) and lowest (bottom) ECS Service quartiles are 7.97% for return and 5.12% for idiosyncratic returns.

4. Conclusions

This study examined the value of CR with regard to the stock price crash at the early stage of the COVID-19 pandemic. To do so, it used a corporate reputation index (Eight Company Score [ECS]), quantifying direct evaluations from external stakeholders in the business network via a survey of holders of the firm’s business cards. The results of the analysis indicate a positive relationship between ECS and returns during the coronavirus shock. This outcome implies that CR can also mitigate shocks caused by damage to the real economy, rather than a financial crisis. The finding helps reinforce the theory that CR is a source of stronger profits for firms.

The results additionally showed that firms with high brand reputations were more susceptible to the coronavirus shock, while firms with a strong reputation for product/service usefulness were more resistant to the shock. This indicates that firms that could build public trust based on useful products/services were more resilient to the coronavirus shock than brand-dominant companies, wherein the image dimension was stronger than the useful value dimension.

The coronavirus shock differed from a stock market plunge associated with financial instability in that, in the former, the stock market plummeted against the backdrop of a real downturn in economic activity due to restrictions on commercial activity and to disrupted social activity. It was also a period in which economic and health insecurity rapidly took hold in society. Our results

---

\(^1\) ECS, is a three-dimensional column vector; \([Brand, Service, People]'\).
### Table 4
Regression analysis for coronavirus shock returns and idiosyncratic returns using ECS and control variables.

| Dependent variable: | Return | Idio return | Return | Idio return |
|---------------------|--------|-------------|--------|-------------|
| Brand               | –0.155** | –0.126*    | –0.145* | –0.096      |
|                     | (0.073)  | (0.073)     | (0.078) | (0.079)     |
| Service             | 0.309*** | 0.261***    | 0.204***| 0.156**     |
|                     | (0.081)  | (0.081)     | (0.076) | (0.076)     |
| People              | –0.080  | –0.077      | –0.029  | –0.038      |
|                     | (0.052)  | (0.054)     | (0.059) | (0.059)     |
| SIZE                | 0.037   | 0.006       |        |             |
|                     | (0.063)  | (0.063)     |        |             |
| LTD                 | –0.051  | –0.072      |        |             |
|                     | (0.045)  | (0.045)     |        |             |
| STD                 | –0.211***| –0.209***   |        |             |
|                     | (0.049)  | (0.047)     |        |             |
| CH                  | 0.046   | 0.053       |        |             |
|                     | (0.055)  | (0.057)     |        |             |
| PR                  | –0.108** | –0.155***   |        |             |
|                     | (0.053)  | (0.051)     |        |             |
| BM                  | –0.041  | –0.018      |        |             |
|                     | (0.054)  | (0.054)     |        |             |
| NBM                 | –1.164***| –0.931***   |        |             |
|                     | (0.264)  | (0.250)     |        |             |
| MOM                 | 0.033   | –0.001      |        |             |
|                     | (0.044)  | (0.045)     |        |             |
| IR                  | –0.290** | –0.311***   |        |             |
|                     | (0.043)  | (0.046)     |        |             |
| Constant            | –0.800***| –0.786***   | –0.466**| –0.478**    |
|                     | (0.193)  | (0.201)     | (0.197)| (0.200)     |

| Four-factor loadings | Yes  | Yes  | Yes  | Yes  |
|----------------------|------|------|------|------|
| Industry Dummy       | Yes  | Yes  | Yes  | Yes  |
| Observations         | 806  | 806  | 806  | 806  |
| Adjusted $R^2$       | 0.225| 0.202| 0.293| 0.285|

**Note:** We regressed the return and idiosyncratic return on constant, ECS scores (brand, service, and people), and cash holding ratio (CH), short-term debt ratio (STD), long-term debt ratio (LTD), profit ratio (PR), logarithm of company size (SIZE), book-value to market ratio (BM), the dummy variables of negative BM (NBM), momentum (MOM), and idiosyncratic risk (IR), 4 factor loadings and industry dummies. This table reports the coefficients, standard errors (in parentheses) observations and adjusted $R^2$. The standard errors were computed using heteroskedasticity-robust method (White, 1980).

$p < 0.1.$  
$**p < 0.05.$  
$***p < 0.01.$

suggest that, against such a societal backdrop, investment funds may have been attracted, or outflows may have been mitigated, to companies perceived in the business community as more substantially necessary for society. Additionally, our results imply it is better to manage reputation by disaggregating its content rather than an overall indicator, such as a score indicating a good reputation. This finding offers notable implications for companies pursuing reputation management. At the time of writing this paper, the transmission of the novel coronavirus had not been contained. Even upon a reasonable level of containment, society’s values may have changed. The results of this analysis suggest that, against a societal backdrop such as that of COVID-19, trust in the social usefulness of products, rather than image value, such as brand or interpersonal relationships with stakeholders, can mitigate risks and contribute to sustainable development. This finding has important implications for not only investors but also those responsible for corporate management strategy.

The study does face a limitation in focusing on a short-term period. This was due to the availability of ECS data. Our future work will aim to include longer-term analysis as ECS data increases and consider a range of unique corporate governance structures in Japan. This will capture changes over time in values with changes in market structure.

Owing to the limited supply of ECS data in Japan, our study was conducted only on Japanese companies. In Japan, business card exchange takes place upon the first interaction at almost every business meeting. This customary business practice drives the high number of users of business card management apps. We can use their network data to efficiently envision reputations based on business connections. Our results may reflect context-specific factors concerning Japan, yet they show that reputation data based on such methods are valuable. Such a method could be applied to other countries and regions by using data from active business-related social networking sites in those areas. The novel and direct CR indicators collected from an online business network should be beneficial for future CR research and important in estimating a company’s intangible assets and financial risks.
Table 5  
ECS Service quartile-based portfolio and coronavirus shock returns.

| Service | Return | Idio return | Return | Idio return |
|---------|--------|-------------|--------|-------------|
|         |        |             |        |             |
| Service 1 | −8.712*** | −9.538*** | −6.267 | −3.369 |
|         | (1.706) | (1.726) | (7.183) | (7.293) |
| Service 2 | 0.261 | 0.068 | 0.002 | −0.218 |
|         | (0.817) | (0.843) | (0.756) | (0.782) |
| Service 3 | 1.202 | 1.210 | 0.443 | 0.457 |
|         | (0.856) | (0.869) | (0.826) | (0.846) |
| Service 4 | 2.624*** | 2.594*** | 1.702* | 1.750** |
|         | (0.876) | (0.890) | (0.869) | (0.890) |

Controls  No  No  Yes  Yes  Yes  Yes
4 factor-loadings  Yes  Yes  Yes  Yes
Industry Dummy  Yes  Yes  Yes  Yes
Observations  806  806  806  806
Adjusted R^2  0.218  0.200  0.291  0.287

Note: We regress the return and idiosyncratic return on constant, ECS service scores quantile portfolio, and control variables (CH, STD, LTD, PR, SIZE, BM, NBM, MOM, and IR), 4 factor loadings and industry dummies. This table reports the coefficients, standard errors (in parentheses) observations and adjusted R^2. The standard errors were computed using heteroskedasticity-robust method (White, 1980).

*p < 0.1.
**p < 0.05.
***p < 0.01.

CRediT authorship contribution statement

Tomonori Manabe: Conceptualization, Methodology, Software, Formal analysis, Investigation, Resources, Data curation, Writing – original draft, Writing – review & editing, Supervision. Kei Nakagawa: Conceptualization, Methodology, Resources, Writing – review & editing.

Acknowledgments

We want to thank all R&D SocSci Group members at Sansan, Inc., Shohei Usui, Shota Komatsu, Naoki Maejima, Takanori Nishida, and Juan Nelson Martinez Dahbura for the review and comments on the early stages of this work. In addition, we would like to thank Adam Goulston, MS, ELS, for editing assistance. We also thank the Editor-in-Chief, Prof. Jonathan Batten, and the anonymous two referees for their valuable comments and suggestions. The data used for this study was provided by Sansan, Inc. and Nomura Research Institute’s Analytical Data Service (IDSQE).

References

Afonso, G., Kovner, A., Schoar, A., 2011. Stressed, not frozen: The federal funds market in the financial crisis. J. Finance 66 (4), 1109–1139.
Baldwin, R., Di Mauro, B.W., 2020. Economics in the time of COVID-19: A new ebook. VOX CEPR Policy Portal.
Black, E.L., Carnes, T.A., Richardson, V.J., 2000. The market valuation of corporate reputation. Corp. Reput. Rev. 3 (1), 31–42.
Brown, T.J., Dacin, P.A., Pratt, M.G., Whetten, D.A., 2006. Identity, intended image, construed image, and reputation: An interdisciplinary framework and suggested terminology. J. Acad. Mark. Sci. 34 (2), 99–106. http://dx.doi.org/10.1177/0092070305284969.
Carhart, M.M., 1997. On persistence in mutual fund performance. J. Finance 52 (1), 57–82.
Deephouse, D.L., 2000. Media reputation as a strategic resource: An integration of mass communication and resource-based theories. J. Manage. 26 (6), 1091–1112.
French, K.R., 2021. Kenneth R. French:. https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html. (Accessed 15 July 2020).
Hall, R., 1992. The strategic analysis of intangible resources. Strateg. Manag. J. 13, 135–144.
Kim, Y., Li, H., Li, S., 2014. Corporate social responsibility and stock price crash risk. J. Bank. Financ. 43, 1–13.
Lins, K.V., Servaes, H., Tamayo, A., 2017. Social capital, trust, and firm performance: The value of corporate social responsibility during the financial crisis. J. Finance 72 (4), 1785–1824. http://dx.doi.org/10.1111/jofi.12505.
Manabe, T., Nakagawa, K., Hidawa, K., 2020. Identification of B2B brand components and their performance’s relevance using a business card exchange network. In: Knowledge Management and Acquisition for Intelligent Systems. Springer.
Podolny, J., Phillips, D., 1996. The dynamics of organizational status. Ind. Corp. Chang. 5, 453–471. http://dx.doi.org/10.1093/icc/5.2.453.
Roberts, P.W., Dowling, G.R., 2002. Corporate reputation and sustained superior financial performance. J. Bus. Res. (69), 2664–2677.
Securities Identification Code Committee, 2018. Sector. https://www.jspx.co.jp/sics/sectors/01.html. (Accessed 10 April 2019).
Sunder, S., 2010. Riding the accounting train: from crisis to crisis in eighty years. In: Presentation At the Conference on Financial Reporting, Auditing and Governance. Lehigh University, Bethlehem, PA.
Waddock, S.A., Graves, S.B., 1997. The corporate social performance–financial performance link. Strateg. Manag. J. 18 (4), 303–319. http://dx.doi.org/10.1108/LICM-04-2017-0195.
Walker, K., 2010. A systematic review of the corporate reputation literature: Definition, measurement, and theory. Corp. Reput. Rev. 12 (4), 357–387. http://dx.doi.org/10.1057/crr.2009.26.
White, H., 1980. A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. Econometrica 817–838.
Yadav, R.S., Dash, S.S., Chakraborty, S., Kumar, M., 2018. Perceived CSR and corporate reputation: The mediating role of employee trust. Vikalpa 43 (3), 139–151. http://dx.doi.org/10.1177/0256090918794823.