The Cost of Big Data: Evaluating the Effects of the European Union's General Data Protection Regulation

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ABSTRACT

In the 1990's the World Wide Web was created, drastically changing the way we do business, communicate, and live our lives. Ten years later in the early 2000's the dot com boom happened, and several years later, new technology giants emerged—like Amazon, Google, and Facebook. From this, we now face "big data" that promises to solve world problems, but has the potential to create turmoil and malfeasance. My research examines the impact of the General Data Protection Regulation (GDPR) enacted in the EU in 2016 on firm value using Tobin's Q and CARs. The implications of my analyses suggest that the GDPR enacted in the EU to ensure data privacy and protection increased consumer trust in business and positively impacted firm value.

INTRODUCTION

The GDPR is the strictest guideline to ever be placed on businesses regarding the collection and use of data, which poses interesting and unexplored questions:

- How does data policy affect the annual costs of business, if at all?
- How does data policy affect different industries?
- Does the stock market react to data policy announcements?

GDPR DESCRIPTION

ANNOUNCEMENT DATE
26 April 2016

ENFORCEMENT DATE
25 May 2018

The key principles of the GDPR are as follow:

- LAWFULNESS, FAIRNESS AND TRANSPARENCY
- PURPOSE LIMITATION
- DATA MINIMIZATION
- ACCURACY
- STORAGE LIMITATION
- INTEGRITY AND CONFIDENTIALITY

REGRESSION ANALYSIS

METHODOLOGY

In the regression analysis, the main variables of interest are firms in the EU between 2016-18, *POST*, and firm value, *Tobin's Q*. The time period of interest in the *POST* variable, 2016-18, serves as a date range which covers the announcement and enforcement of the GDPR which was enacted on EU firms. Control variables are used to account for differences in the sizes of firms, inherent differences between US and EU firms and industry differences. *Tobin's Q* is the dependent variable in the regression analysis.

Flag of the European Union

RESULTS

TABLE 1- REGRESSION ANALYSIS RESULTS

	Estimate	Standard Error
(Intercept)	0.88***	0.03
POST	0.04***	0.01
ln(Total Assets)	0.02***	0.01
ROA	-0.001	0.0003
Country = EU	-0.14***	0.01
Industry = Mining	-0.07**	0.03
Industry = Construction	0.001	0.03
Industry = Manufacturing	0.23***	0.02
Industry = Transportation and Communication	0.09***	0.02
Industry = Wholesale Trade	0.11***	0.03
Industry = Retail Trade	0.20	0.03
Industry = Finance and Insurance	-0.10***	0.02
Industry = Lodging Services	-0.07*	0.03
Industry = Advertising Services	0.24***	0.03
Industry = Technology Services	0.35***	0.02
Industry = Health Services	0.21***	0.03
Industry = Research and Consulting Services	0.35***	0.03

In the regression model, 14% of the variation in Industry, natural log of Total Assets, ROA, Country, and *POST* describe the variation in *Tobin's Q*. The results of the model are statistically significant. *POST* is statistically significant and positive, indicating that after controlling for the size of the firm, the inherent initial differences between US and EU firms, and Industry, that the GDPR positively impacts and increases firm value for the EU firms.

The announcement and enforcement of the GDPR *improves firm value.*

MARKET REACTION (CARs)

METHODOLOGY

To gauge how the market responds to the news of the GDPR, cumulative abnormal returns (CARs) were calculated for every firm in both the EU and US around a 5-day window (-2, 2) for 26 April 2016. The US firms serve as the control group, as the GDPR is currently only enacted in the EU.

RESULTS

The EU firms had an average CAR of positive 0.13 percent, which indicates that the stock market returns for the 5-day (-2,2) time period were more positive than expected.

TABLE 2- MARKET REACTION: CUMULATIVE ABNORMAL RETURNS

Grouping	N	Average CAR	SD of CAR
EU	5005	0.13%	0.2349
US	3446	-0.50%	0.0593

The market responded *more positive than expected* to the announcement.

CONCLUSION

- The announcement and enforcement of the *GDPR improves firm value*
- The *market responded more positive* than normal expectations to the announcement of the GDPR
- My observations suggest that the GDPR enacted in the EU to ensure data privacy and protection *increased consumer trust* in business

For further implications of this study, it would be interesting to evaluate the why behind why the GDPR has increased consumer trust in business: Is the same true for other data policies? Does consumers' trust change after an incident or breach in data policies? Would there be a different observed impact if a similar study was performed several years later?

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