

Fighting Fraud with Scientific Research

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Abstract: *This paper provides a scientific perspective about the research on fraud. Fraud analysts show wide variety of techniques that help to prevent losses and recover quickly as well as the security issues. Exploring how auditors, corporate security prevention managers, and fraud prevention professionals can stay one step ahead of criminals. Scientists all over the world address the different types of analytics in detecting fraud, including descriptive analytics, predictive analytics, and social network analysis and their results is possible to find in various databases of scientific papers.*

Keywords: *fraud, scientific papers, financial fraud, research*

JEL codes: M21, M41, M42

1 Introduction

Over the last 17 years, the financial industry has been plagued by consecutive waves of financial crime. (Ondrušová, 2011) The accounting fraud in major corporations like Enron at the beginning of the new millennium, Ponzi schemes in major investment funds, miss-selling of financial derivatives, the stock options scandal are only a few in a long list of examples. The financial crisis of 2007–2008 revealed rampant fraud in the mortgage industry. Although financial crimes are not a new phenomenon in any sense, both the frequency with which they occur and their scope and impact seem to have increased over the last few decades. Many authors have suggested that frauds are more significant than in any other sector of the economy (Freeman 2010; Fligstein, Roehrkasse 2013).

It is estimated that a typical organization loses about 5 percent of its revenues due to fraud each year. (Juhásová, Užík, 2015) The sooner fraud detection occur the better – as the likelihood of further losses is lower, potential recoveries are higher, and security issues can be addressed more rapidly. Catching fraud in an early stage, though, is more difficult than detecting it later, and requires specific techniques. Authors all around the world examine fraud patterns from historical data in order to detect fraud early in the process that results in publishing scientific publications that can be applied in educational process and also in praxis. (Baesens, B., Vlasselaer, V., Verbeke, W. 2015).

2 Methodology and Data

The primary goal of this paper is to analyze scientific papers that has mission to provide independent, nonpartisan expertise on anti-fraud policies, procedures, and best practices, help to understand the causes and effects of financial fraud by serving as a catalyst for the exchange of ideas among top anti-fraud practitioners, government officials, and academics. While analyzing scientific papers databases we set several hypotheses.

As a source of data was used Web of Science and Scopus database when querying all scientific publications between 2001 and 2016 for the key term fraud and financial fraud. It shows the total number of papers published each year, the number of citations and the top six most-cited papers.

3 Results and Discussion

We examined the publications about fraud for last 16 years published in two databases - Scopus and Web of Science. Among 10770 articles were published in Scopus during period 2001-2016 and 8402 publications were published in Web of Science database during the same period. We must take into account also the fact that some articles for year 2016 may not have been recognized in databases yet. We tested several hypotheses:

- increase of publications focused on financial fraud merely reflects an increase in total publications focused on fraud,
- financial fraud research appears to be a relatively recent,
- publications from USA has a considerable impact on the financial fraud literature,
- number of citations is correlated with the impact factor of the journal in which an article was published.

Table 1 Publications focused on fraud filtered by year

Year	No. of publications focused on fraud	No. of publications focused on financial fraud
2016	1121	208
2015	1050	203
2014	755	119
2013	676	117
2012	645	114
2011	620	96
2010	588	89
2009	574	83
2008	431	65
2007	380	43
2006	369	40
2005	293	29
2004	262	28
2003	234	20
2002	216	18
2001	188	12

Zdroj: www.webofknowledge.com

First hypothesis is that the increase of publications focused on financial fraud merely reflects an increase in total publications focused on fraud. To test this possibility, we determined the number of publications indexed each year, and compared these values to the annual number of publications focused on fraud. Between 2001 and 2016, 8402 publications focused on fraud were published in Web of Science database, and 1284 publications about financial fraud were published in Web of Science database – 15% of all publications about fraud were focused on financial fraud. In 2001, 188 publications about fraud were published; in 2016, 1121 publications were published, representing a nearly 6-fold increase. From 2001 to 2016, the change in financial fraud publication rate was 17-fold increase. However, the rate of increase in publications about financial fraud was greater than the rate of increase in all publications about fraud, implying a true acceleration in publications about financial fraud over this time period.

Table 2 Publications focused on fraud filtered by year

Year	No. of publications focused on fraud	No. of publications focused on financial fraud
2016	1347	416
2015	1360	422
2014	1277	363
2013	1269	350

2012	1249	351
2011	1146	353
2010	1109	317
2009	968	279
2008	800	209
2007	792	192
2006	802	183
2005	683	163
2004	623	154
2003	595	126
2002	527	112

Zdroj: www.scopus.com

Between years 2001 and 2016, 14547 publications focused on fraud were published in Scopus database, and 3990 publications about financial fraud were published – 27% of all publications about fraud were focused on financial fraud. In 2002, 527 publications about fraud were published; in 2016, 1347 publications were published, representing a nearly 2,5-fold increase. From 2001 to 2016, the change in financial fraud publication rate was almost 4-fold increase. However, the rate of increase in publications about fraud and financial fraud was smaller than in Web of Science database, we can still talk about an acceleration in publications about financial fraud over this time period.

Table 3 Publications filtered by country

Country	No. of publications
United States	537
United Kingdom	142
China	73
Australia	68
Canada	62
Germany	37
Malaysia	34

Zdroj: www.webofknowledge.com

Our results show that countries mentioned in the table above have had a considerable impact on the financial fraud literature. The proportion between countries is similar in both databases. There are only 4 publications in the topic of financial fraud in Scopus database from Slovakia and 11 publications from Czech Republic. In Web of Science database there are 8 publications from Slovakia and 7 from Czech Republic.

Table 4 Publications filtered by country

Country	No. of publications
United States	1003
United Kingdom	259
China	145
Australia	122
Canada	94
India	82
Germany	58

Zdroj: www.scopus.com

The phenomenon of financial fraud research itself appears to be a relatively recent. (Parajka, 2015) There was only one financial fraud publication indexed in Web of Science published in 1985 and the next financial fraud publication was published only in year 1987. For 15 years (during the period 1985-2000) were published only 98 financial fraud publications. Similarly, the first articles focused on fraud were published in 1985 but in higher amount – 68 publications.

The earliest publication focused on fraud in Scopus database was published in year 1889. During the period 1889 – 1961 in average 2-3 publications were indexed (exception in year 1906 when 14 publications were indexed). In year 1985 already 128 publications were indexed. Financial fraud research is more widely recognized as a remedy for a publication in the modern era, and the reasons for publications have expanded over time.

Data fabrication and falsification are not new phenomena in accounting. (Pakšiová, 2015) Our results (Table 5) suggest that the overall rate of publications is focused on fraud in general, crime, fraud detection, corporate governance, ethics, etc. About 10% of papers mentioned study the use of analytics for fraud detection, clearly illustrating the growing attention in the field for data-driven approaches. Better understanding of the structure of publications focused on financial fraud can potentially inform efforts to change the focus of research and spread the results of research among the lay public.

Table 5 Publications filtered by keyword

Keyword	No. of publications
Fraud	656
Crime	142
Fraud Detection	105
Corporate Governance	70
Ethics	68
Computer Crime	60
Electronic Commerce	59
Corruption	56
Forgery	52
Auditing	50

Zdroj: www.webofknowledge.com

Widespread use of the internet has been hypothesized to increase the level of citation given to published articles. (Tumpach, Máziková, Kuceková, 2015) To test the hypothesis that the number of citations is correlated with the impact factor of the journal in which an article was published, as a measure of article visibility or popularity. We postulate that impact factor is a reasonable surrogate for peer scrutiny as high-impact factor journals are cited more widely because they are seen more widely.

Table 6 Highest cited publications

Journal	Year	No. of citations	IF (2016)	IF (5 year)
Journal of Finance	2011	270	6,043	8,96
Journal of Financial and Qualitative Analysis	2008	199	1,673	3,107
Nature (multidisciplinary journal)	2014	55	40,137	43,769
Food control (multidisciplinary j.)	2015	28	3,496	3,584

Legal and Criminological Psychology	2015	27	1,822	2,017
Journal of Financial Economics	2015	15	4,505	6,991

Zdroj: www.webofknowledge.com

According the table 6 and 7 we can state that there is not significant correlation between the most cited publications and the high impact factor of the journal in which an article was published.

Table 7 Highest cited publications

Journal	Year	No. of citations	IF (2016)	IF (5 year)
Auditing	2004	385	2,45	-
Journal of Finance	2011	369	6,043	8,96
Accounting Review	2005	311	2,304	4,396
Accounting Horizons	2000	305	1,218	1,564
Accounting Horizons	2003	246	1,218	1,564

Zdroj: www.scopus.com

There were not found significant differences between Scopus and Web of Science databases.

Conclusions

We can deter fraud only if we understand it. Many organizations are supporting research to find the root causes of fraud and offering businesses and government tools for deterrence and prevention.

Academic institutions, industry leaders, law enforcement agencies are all working to support multidisciplinary research and education on the prevention of fraud and corruption.

A couple of conclusions can be drawn as follows:

- 5274 scientific papers have been published on the topic of financial fraud in both databases (Scopus and Web of Science) during the period reported.
- A substantial increase in the number of scientific articles has been observed.
- The number of publications on the topic of financial fraud is steadily increasing, which shows a growing interest from the academic community and research on the topic,
- The number of publications from USA published each year has risen sharply in the last years, including both databases.
- The citations are exponentially growing, which is associated with the increasing number of publications,
- High-impact factors publications do not have a high impact on citations,
- About 10% of mentioned papers study the use of analytics for fraud detection, clearly illustrating the growing attention in the field for data-driven approaches.

Despite the enormous scope of the problem, academic research should be reinforced and research should be focused on the costs of financial fraud, root causes or effective methods to identify, deter, and prevent financial fraud.

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