

Investigating how the digital publishing industry influences print publishing industry in Japan during the period from 2014 to 2021 based on annual sale values

Abstract

The rise of digital publishing has raised questions about whether the publishing market will be dominated by digital media. However, studies on the impact of digital publishing on printed publishing in Japan are outdated, as they were mostly conducted prior to 2015. To fill this gap, our project aimed to examine the influence of digital publishing on print publishing in Japan from 2014 to 2021. Our analysis of annual sale values using linear and non-linear models suggests that digital publishing has contributed to a decline in print publishing sales. Nevertheless, the study's findings should be viewed with caution due to limitations in data collection and source selection. Future research should consider other factors, such as annual salaries and covid, to investigate the global interaction between print and digital publishing industries.

Introduction

The influence and popularity of the digital publishing industry have become increasingly powerful due to the continuous release of online purchase platforms and electronic devices. The capacity for large storage volumes and related lightweight of digital reading devices seemed to outcompete traditional printed publications for the public. Moreover, traditional print-based companies have shown a trend of digital transformation (Villi & Hayashi, 2017), leading to the reasonable question of whether the future publishing market will be dominated by digital publishing. However, this conjecture may be exaggerated. Conventional printed publishing was still the first choice for readers worldwide (Ovide & García-Peñalvo, 2018). Even in 2010, the first year of eBook publication in Japan, the market was dominated by printed publishing (Miyachi, 2003). Although the eBook platform has caused a shrinkage in the printed market, digital publishing has not influenced the sale values of printed publishing in Japan (Asai, 2015). However, these conclusions may not be valid in the current circumstances, as most studies were conducted before 2015. Therefore, there was a gap in our understanding of the influence that digital publishing has had on print publishing in recent years. The aim of this project was to investigate how the digital publishing industry has influenced the print publishing industry in Japan from 2014 to 2021, specifically focusing on the relationship between the sale values of the print and digital publishing industries. Our hypothesis was that the increase in the sale values of digital publishing will lead to a decrease in the sale values of print publishing in Japan.

Methods

All data were collected from the publishing industry research page in Japan in Statista (<https://www.statista.com/topics/9291/publishing-industry-in-japan/>). Annual sale values of the print publishing industry and digital publishing industry in billion Japanese yen from 2014 to 2022 in Japan were collected. In addition, annual sale values of printed and digital comic books of the same unit from 2013 to 2021 in Japan were collected. We selected the period of 2014-2021 as the study period to cover the period of collected data. Simple linear models and non-linear least squares were used to fit the data. In this paper, we chose the annual sale values of the digital publishing industry as the explanatory variable and the annual sale values of the printed publishing industry as the response variable in our models. For the Japan comic book analysis, we chose the annual sale values of digital comic books as the explanatory variable and the annual sale values of printed comic books as the response variable.

Results

The simple linear model showed that an increase of 1 billion Japanese yen in the digital publishing industry will lead to a decline of 1.14 billion Japanese yen in the printed publishing industry in Japan ($p < 0.05$, $R^2 = 0.79$, F-statistic = 27.77, degree of freedom = 6). The diagnostics of the simple linear model have been checked. For the non-linear models using non-linear least squares, two formulas were generated: (1) $y = 0.0049x^2 - 3.98x + 2011$ ($p < 0.05$); (2) $y = 4611.7x^{(-0.223)}$ ($p < 0.05$), where x is the annual sales values of the digital publishing industry and y is the annual sales values of the printed publishing industry. Model (2) fitted the data better than model (1) with a ΔAIC greater than 2. For the Japanese comic book market, a non-linear model using non-linear least squares was shown: $y = -0.00001x^3 + 0.0099x^2 - 2.78x + 400$ ($p < 0.05$), where x is the annual sales values of digital comic books and y is the annual sales values of printed comic books (Figure 1).

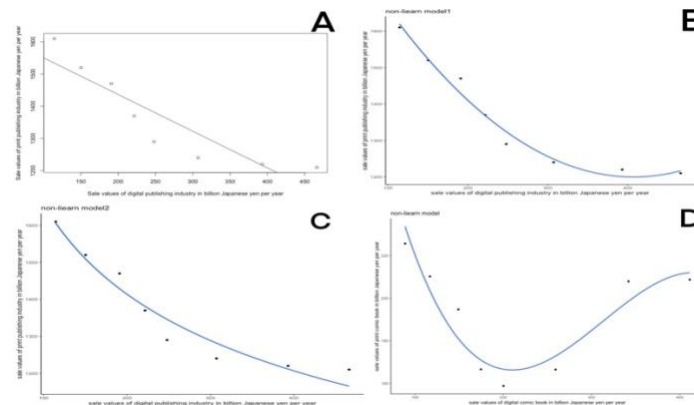


Figure 1. (A) graphs of simple linear model of sale values between digital and printed publishing industry; (B)&(C) graphs of non-linear models using non-linear least squares of sale values between digital and printed publishing industry; (D) graphs of non-linear model using non-linear least squares of sale values between digital and printed comic book.

Discussion

Our study results revealed that the annual sale values of the digital publishing industry growth could lead to a decrease in the annual sale values of the printed publishing industry across all three models. However, despite this trend, the printed publishing industry still dominated a significant portion of the market, with annual sale values three times greater than that of the digital publishing industry in Japan in 2021. For comic books, an increase in the annual sale values of digital comics initially decreased the annual sale values of printed comics. But when digital comic sales exceeded 210 billion Japanese yen, the increase started to promote the annual sale values of printed comic books.

Despite the advantages of digital publishing, one possible reason for the decrease in annual sales of print publishing could be the increase in the second-hand market in Japan (Asai, 2015). The rise of second-hand bookstores and rental shops offers newly released series to customers at low prices. Furthermore, the rental systems of libraries provide convenient access to a wide variety of print publications. However, the current market is still dominated by print publishing rather than digital publishing. One possible explanation for this may be a misunderstanding of adolescents' preferences. There was no evidence to suggest that adolescents prefer digital publishing to print publishing (Merga, 2015). Another aspect to consider when explaining the pattern of interaction between the annual sale

values of digital and print publishing is the reading experience. People have different preferences for reading on print paper or digital screens based on personal experiences (Bao et al., 2019). More people seem to agree that the experience of reading comic books on a digital screen is better than on print paper, resulting in a significant increase in the sales of digital comic books. However, attitudes toward digital books and magazines are complex. The complexity of personal preferences may be one reason to explain why the annual sale values of print books and magazines are still higher than digital ones, even though the annual sale values of print books and magazines show a declining pattern.

The project had several limitations. Firstly, the collected data was limited, despite covering a relatively long period of 8 years from 2014 to 2021. Only 32 values of sale values were collected, which may not be sufficient to draw a comprehensive conclusion. Additionally, the selection of data sources was a challenge, as different sources could provide different values for the same data point. Lastly, other factors, such as annual salaries and covid, may have influenced the sale values of the publishing industry, and exploring their effects on the interaction between print and digital publishing industries could be a potential avenue for future research. To gain a more complete understanding of the publishing industry, a more comprehensive dataset, encompassing a global perspective, would be necessary.

In conclusion, the analysis indicates that the digital publishing industry has led to a contraction of the print publishing industry in Japan between 2014 and 2021. However, due to limitations in data collection and source selection, the results are uncertain. Further research could explore the impact of additional factors, such as annual salaries and covid, on the interplay between print and digital publishing industries on a global scale.

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Reflection

Through working on the mini-project, I have come to understand the importance of time management. Time management is one of my weaknesses, so for this project, I started by thinking about the topic and gathering useful data before the start of the working week. This gave me the confidence and enough time to focus on data analysis without worrying about topic selection and data collection. Another important lesson from this project is the value of rereading. I read through my paper once a day after finishing writing it. Although I only reread it twice, I found some misunderstandings and mistakes in my writing. I also had time to find and improve my logic.

The most challenging part of the project was topic selection and identifying the research question. I had many ideas for the project, but it was difficult to break down complex questions into one simple sentence. It was also challenging to find and relate enough data for analysis. Additionally, it was a question of which source or database to choose. In this project, I searched and compared data from different databases and chose the one that provided more comprehensive data, such as a longer time period, more sub-group data, and a consistent unit. Furthermore, it was important to collect as much data as possible, even if it was not all included in the analysis or writing. In the project, I collected data on three sub-groups in the publishing industry: books, magazines, and comic books. I analysed all three, but only found the pattern of comic books to be more interesting than the other two. If I had only collected data on comic books, I would not have had the comprehensive pattern of the specificity of the pattern.

My strength lies in time management. I have tried my best to improve it and found that my time management for the mini project was better than previous assessments. This is an area in which I will continue to work to improve.

For the main project, the first and most important thing is to identify your specific question and determine what kind of data you need. It is also important to question the quality of the data when collecting them from different sources. The second thing is to collect as much data as possible within the given time. Although you may not be able to include all the data in the paper, some hidden results will only be found when considering multiple factors. The last thing is to reread the writing several times at different phases. Some problems may not be noticed when you first finish your work. Additionally, it is not a good idea to focus too much on questions you cannot solve at the moment. Rereading and rethinking can sometimes clear your mind and strengthen your thoughts.