

Effect of Digital Service Data-based Study on the UK's DST and Google

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Abstract—With the expansion of the digital economy, European countries (e.g., the UK) have proposed and implemented the Digital Service Tax (DST in the following parts) to giant digital service companies (e.g., Google) started in 2020. It is necessary to investigate whether the DST costs large from a company's revenue, and if the DST will keep rising in the future. This work is designed to draw an outlook to address the two questions. On this basis, a data-based case study is carried out of two major entities in DST issues: the UK as the tax collector and Google as the taxpayer. The data of Google's total revenues and advertising revenues are collected from 2018 to 2020 for estimation, and the UK's DST rate of 2% is used. To process the data, Microsoft Excel and CORREL functions are applied to calculate data and make a chart based on the analysis. According to the result, this work found a tiny percent of DST compared to Google's revenue. The amount of DST may follow an increasing trend while the percent of DST in total revenue decreases and the percent of DST in advertising revenue remains unchanged. The difference between the two percentages is due to the decreased percent of advertising revenue in each year's total revenue. Based on the analysis, the DST would not significantly affect a company like Google who provides digital services. Nevertheless, DST may keep rising in its actual amount. Since European countries with a DST mostly charge the tax on advertising revenue (tax foundation), companies like Google may try to develop mediums other than online advertisement to earn revenue and alleviate the effect of rising DST. These results shed light on how customers and companies should act upon the DST.

Keywords-Digital Service Tax (DST); Digital Service Economy; UK; Google

1 INTRODUCTION

In April 2020, the UK implemented its digital services tax (DST in the following parts) on social media platforms, Internet search engines, and online marketplace. Besides the UK, half of the European Organization for Economic Cooperation and Development (OECD) nations have either announced, proposed, or implemented a DST [1]. This trend reflects a change that is happening to the international tax system. For a long time, the tax was referred and employed to physical goods and services, which follows the traditional economic frame [2]. However, with the development of digital technology, the digital economy became a major target of the market. This new business model of the digital economy is based on fast-moving information and communication technologies and exploitations of a huge amount of data. As a result, the

new economy form blurs the line between government (the tax collector), and companies running digital services (the taxpayer) [2]. Without a physical presence, the digital economy does not fit in the current international direct tax system where the location-specific rent (LSR) was failed to be allocated to the jurisdiction where the rent rises under the traditional international tax regime [3].

Furthermore, the key peculiarity of the main digital business models lies in the circumstance that it is possible to generate profits in a country without the need to locally deploy the current framework of profit attribution [4]. Since then, sales and software development activities performed and IT assets employed by companies in foreign markets can lead to the generation of substantial revenues, which are not been taxed [5]. Therefore, a new policy, the DST, is developed to adopt these changes. DST allows LSR earned by digital platforms to be captured by countries which such rent rises [3].

However, how would the new tax affect the companies in the digital economy remain ambiguous, and the DST has not reached a year since its announcement in different European countries. Meanwhile, tax actions have been initiated by several governments while the effects of the reforms on tax and corporate decisions are unclear [5]. In summary, this paper aims to find a possible result through case on UK's DST and its effect on Google, the giant company in the digital economy spectrum. Therefore, this work purposed two hypotheses:

Hypothesis 1: DST costs a considerable amount from company's revenue

Hypothesis 2: DST may keep rising for companies

This work would try to estimate the influence of DST on major digital companies, and form a possible prediction for the future trend on DST's impact on digital companies' revenue. Companies with digital services that are involved in the range of DST can derive a deeper understanding of the situation. Customers who employ those digital services can learn how digital companies may act, or whether there will be an influence on customers as well.

To address this topic, this article is organized as follows. In section 2, the author introduces the three consecutive methods employed for data analyses. The author also introduces the variables in this section. In section 3, the author presents the result deducted from the methods in section 2. Then, the author discussed the findings based on the result. The result covers all the tables, figures, and analyses for them. The discussion tests the two hypotheses based on the interpretation of the result. Finally, in section 4, the author concludes the findings from the result and analyses. The author also discussed the further applications of the findings.

2 METHOD

This work uses a case study as the main method, and the two purposed hypotheses are testified accordingly. The case study focused on UK's DST on Google, and give a simple prediction of DST's future effect. Simple data-collecting and mathematical calculations are used and implemented in Microsoft Excel. This work uses the Excel function CORREL to calculate percentages and used the calculated data to construct a combo chart. No computer coding is

implemented. Since the UK's DST was implemented on April 1, 2020, and not enough data is available, so this work use past data from 2018 to 2020 for estimation.

2.1 Data Collecting

Collected data are from US Securities and Exchange Commission (SEC) [11] and Statista.com [12], including Google UK's total revenue (UR), Google's total revenue (TR), Google's advertising revenue (AR), and UK's DST rate (R). All the data are collected from the year 2018 to 2020. This work includes advertising revenue because advertising revenue is about 80% of Google's total revenue, i.e., it plays a significant role in estimating the trend of DST.

2.2 Equations

This work calculated the following terms:

Estimated DST in the UK (ED),

Percent of DST UK in Total Revenue (PTR),

Percent of DST UK in Advertising Revenue (PAR) for 2018 to 2020 using the formulas below:

$$ED = UR * R \quad (1)$$

$$PTR = ED / TR \quad (2)$$

$$PTR = ED / TR \quad (3)$$

2.3 Constructing Chart

Construct a combo chart with both columns and lines using the data calculated in 2.2 by formula (1), (2), and (3). This chart is constructed with Excel's inbuilt chart function.

3 RESULTS AND DISCUSSIONS

3.1 Tables

TABLE1 UK's ESTIMATED DST

Year	UR (British pound)	UR (dollar)	R	ED (dollar)
2018	1.406	1.827	2%	0.037
2019	1.600	2.080	2%	0.042
2020	1.805	2.346	2%	0.047

All money in billion

TABLE 2 PERCENT OF UK DST IN TOTAL REVENUE AND ADVERTISING REVENUE

Year	TR	PTR	AR	PAR
2018	136.36	0.027%	116.46	0.032%
2019	160.74	0.026%	134.81	0.031%
2020	181.69	0.026%	146.92	0.032%

All money in billion dollars

TABLE 3 PERCENT OF GOOGLE ADVERTISING REVENUE IN TOTAL REVENUE

Year	TR	AR	Percent of AR in TR
2018	136.36	116.46	0.85%
2019	160.74	134.81	0.84%
2020	181.69	146.92	0.81%

All money in billion dollars

3.2 Results from the Tables

As summarized in Table 1, as the UK has a constant rate for DST, with Google’s increasing annual revenue in the UK, the DST would increase as well. According to Table 2, taking 2018 to 2020 as an estimation, the percent of DST in Google’s annual revenue only takes about less than 0.07%. This amount is not significant. The percent of DST would be higher when calculated based on annual advertising revenue, which is less than or equal to 0.08%. Both the amounts are not significant. From a previous study by Matthias Bauer at the European Center for International Political Economy (ECIPE), the average effective corporate tax rates (ECTR) for digital corporations from 2014 to 2016 is 31.5% [6]. Compared to Bauer’s data, 0.07% and 0.08% are relatively tiny. Therefore, Hypothesis 1 is rejected. Additionally, in return for UK’s DST, Google asked its advertisers in the UK to absorb the DST started on November 1, 2020 [7]. As a result, Google would take small or even no effect from the DST. Hypothesis 1 is further rejected.

3.3 Figure

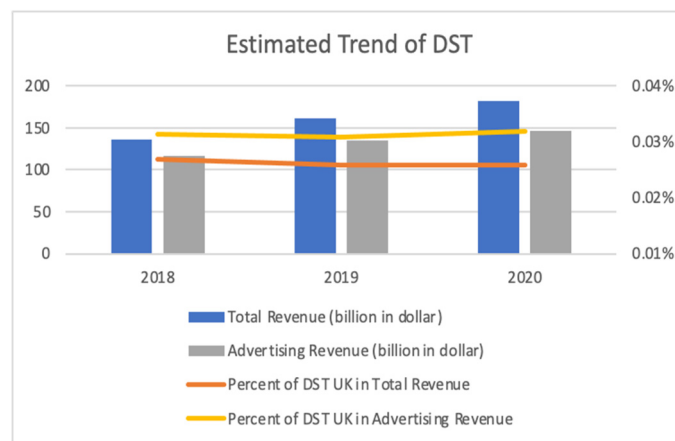


Figure 1. Estimated Trend of Percent of DST in Total Revenue and Advertising Revenue

3.4 Discussions

As depicted in Fig. 1, Google's total revenue (TR) and total advertising revenue (AR) are increasing for the past three years. Hence, one can assume these two revenues would keep increasing in the future. Under this assumption and from Fig. 1, PAR is fluctuating within a small range, following a roughly unchanged trend. However, though PAR shows an unchanging trend, PTR shows a decreasing trend. This difference may be due to the decreased percent of advertising revenue in total revenue as listed in Table 3. Since Google's major revenue is from advertisement, if the percent of advertising in total revenue keeps the decreasing trend, we can expect the PTR to decrease while PAR remains unchanged in the future. From Table 1, the estimated DST (ED) is rising each year, hence the actual amount of DST may follow an increasing trend in the future. Since Google's 80% of annual revenue is from its advertising earnings, an increasing AR and an unchanged PAR would imply that though the actual amount of DST is rising, its percentage in advertising revenue would remain roughly unchanged. Therefore, Hypothesis 2 is partly true.

Based on the findings above, the DST would not significantly affect a company like Google who provides digital service. Nevertheless, DST may keep rising. Since European countries with a DST mostly charge the tax on advertising revenue [1], companies like Google may try to develop mediums other than online advertisement to earn revenue and avoid rising DST. The trend of DST would keep expanding with more countries joining in. Currently, all DSTs are targeted at US companies, so there might be future modifications to make it not such discriminatory [8].

In the future, the DST may keep rising, and more countries are expecting to employ a DST based on their own national conditions [9]. However, DST may not be a long-term solution. To solve this problem, one possible solution may require the creation of a new nexus by introducing a digital Payment Establishment (PE) or a significant economic presence test [10].

This work uses past data as estimation, i.e., the results are limited only in assumptions. Moreover, this work used a case study rather than a massive data analysis. Future studies can focus on more precise data after DST is implemented for two to three years, and with a larger scale on different countries and companies.

4 CONCLUSION

In conclusion, this paper investigated the newly announced and implemented DST and its impact on companies through a case study on UK and Google. Though the scale of the study is restricted, it took the major players in the DST: the UK as the major country in proposing DST and Google as the giant digital service company in the world. Based on the analysis, the DST would not significantly affect a company like Google who provides digital service. Nevertheless, DST may keep rising, and more countries are expecting to employ DST. Since now digital services' revenue is mainly from advertisement for companies like Google, a solution to the DST may be developing revenue sources other than advertisement. Since the effect on digital companies is not significant according to the results, the current DST may not be a long-term solution. In regard to this, one possible long-term solution for taxing digital services is to introduce a digital Payment Establishment (PE). Therefore, for companies like Google, though

the impact of DST is not severe, it is necessary to consider future solutions. While this work shows an increasing trend in DST amount and roughly unchanged percentage in major advertisement revenue, future studies may show another picture on this topic. Overall, these results offer a guideline for customers relating to digital service companies and pave a path for potential companies that may be affected by DST in the future.

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