A MULTIPLIER OF E-CONSUMPTION: THE STUDY OF THE DEVELOPING ECONOMY

Tanpat Kraiwanit *

* *Corresponding author*, Faculty of Economics, Rangsit University, Pathum Thani, Thailand
Contact details: Faculty of Economics, Rangsit University, Pathum Thani, 12000, Thailand

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Abstract

In 2020, private consumption in Thailand grew slowly due to the COVID-19 pandemic and e-commerce has grown rapidly (Macroeconomic Strategy and Planning Division, Office of the National Economic and Social Development Council of Thailand, 2020). The objectives of this study are to examine the proportion of e-consumption and private sector consumption in Thailand and to understand the multiplier effects affecting e-consumption in Thailand. The internet users who have shopped and sold as merchants through online platforms across Thailand have been utilised online for this survey. The findings show that most goods and services were purchased offline, except for clothes, shoes and personal items, and communication. In contrast, goods and services for entertainment and travelling had the highest percentage of online purchases. The results of the study model show the significance of education and saving to e-consumption. Hence, the multiplier of e-consumption in this study equals 1.21. Since private consumption had a higher significance for the Thailand economy over total public consumption, it is, therefore, recommended that ICT infrastructure development should be prioritized for ease of e-consumption. Moreover, human skills need to be improved and e-retail should be encouraged.

Keywords: E-Consumption, Multiplier, Private-Sector Consumption, GDP, Thailand

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1. INTRODUCTION

In the first quarter of 2020, there was a slow expansion of private consumption in Thailand. Even though the expenditures of nondurable goods spent by households increased, private sectors had spent less money on durable and semi-durable goods, and the income and consumer confidence had decreased significantly. The COVID-19 pandemic began to spread in Thailand at the beginning of 2020, creating anxiety for residents across Thailand. Consequently, many people stocked up with a large amount of food and beverages, leading to an expansion of non-durable goods by 2.8% in this quarter. The consumer confidence index (CCI) was at 49.7, compared to 56.8 in the previous quarter (Macroeconomic Strategy and Planning Division, Office of the National Economic and Social Development Council of Thailand, 2020). In the third quarter of 2020, there was a decline of private final consumption expenditure (PFCE) by 0.6%, compared to the previous quarter. However, PFCE rose by 7.3% QoQ SA (quarter over quarter seasonally adjusted), which is higher than PFCE in the second quarter

(National Accounts Division, Office of the National Economic and Social Development Council of Thailand, 2020). This is the consequence of relaxing the lockdown measures; therefore, people began to spend money outside the house (Bank of Thailand, 2020).

Even though there was a slow growth of private-sector consumption in Thailand in 2020, e-commerce grew rapidly. The year 2020 was a truly golden time for online businesses because modern technologies and recent digital tools can improve effective marketing plans, which convey customers directly. Furthermore, the COVID-19 pandemic was a significant event that provoked drastic changes in customer behaviour (Bangkok Bank, 2020). Online purchases have risen dramatically in a wide range of goods and services because people need to stay home during the COVID-19 crisis to prevent the spread of the virus. Therefore, e-commerce has been involved in many industries to enhance national consumption and stimulate the Thailand economy during this crisis (TMB Bank, 2020). Kannikar (2019) reports that the current consumer behaviour differs significantly from previous behaviour. This could be seen, for example, from the study of GroupM, a Thailand media agency, which has studied the consumer behaviour of new mobile Internet users across Thailand. Their findings show that about 80% of the Thailand population are able to access the internet from 2017 to the present, indicating that the internet and digital platforms have become a necessity of digital life and are common channels for communication.

According to a survey of the value of e-commerce in Thailand in 2018 by TMB Bank (2020), the value spent through e-commerce was estimated to make up half of the total spent through retail and wholesale businesses. Online spendings in foods, processed foods, and beverages amounted to 170,000 million baht or about 10% of total spending through the retail and wholesale sector. The online spending in other merchants (except fresh foods, processed foods, and beverages) accounted for 640,000 million baht, or about 40% of the total spent through the retail and wholesale sector. During the COVID-19 pandemic, even though a number of people have been experiencing more limitations in earning incomes due to the severe economic downturn, there were higher purchase intentions among consumers. Online sales throughout 2020 were expected to rise in many merchants because the mandatory lockdown confined people to stay home. Online shopping trends have since tended to be long lasting, even following the end of locking down. Therefore, the actual value of online spending through retail and wholesale e-commerce throughout 2020 was estimated to increase by about 19% or spending 14,900 million baht per month more compared to last year. This amount is higher than the value spent normally, which is expected to grow by about 9% or spending 7,600 million baht per month more compared to the previous year. Hence, the estimated total value of purchasing goods via online platforms throughout 2020 rose by 87,700 million baht, compared to the value spent normally that made up about 1.5% of private-sector consumption or about 0.8% of Thailand's GDP. Although the Thailand economy is currently shrinking, online shopping during the lockdown has led to dramatic growth for many merchants; therefore, the effects of temporary shop closures are minimized; and this can carry Thailand's consumption and economy at a certain level.

A multiplier is a tool that is used by many economists and governments to boost the national economy. Although many researchers have analysed the multiplier in a wide range of industries and perspectives (Sevatapukka, 2018; De Ridder, Hannon & Pfajfar, 2020; Crul, Schneider, Keskiner, & Lelie, 2017), the multiplier of e-consumption has rarely been explored. Hence, in the Thailand context, this study attempts to investigate the use of a multiplier of e-consumption, the proportion of e-consumption and private-sector consumption, and the multiplier effects for e-consumption.

The remainder of the paper is structured as follows. Section 2 reviews the relevant literature. Section 3 analyses the methodology that has been used to conduct empirical research. Section 4 shows the significant results. Section 5 analyses and discusses the results. The last section provides concluding thoughts, limitations of the study, and directions for future study.

2. LITERATURE REVIEW

2.1. Gross domestic product (GDP)

Gross domestic product (GDP) serves as an indicator to measure the prosperity of a country's economy and it reflects the total monetary value of the overall domestic production of a country in a specific time period. It is commonly used by governments and economists during planning and policy formulation (Sahoo & Das, 2019, p. 31).

Poonsateansup (2021), an independent financial planner of the Dependent Financial Planner of Siam Commercial Bank, Thailand, explains the formula for calculating GDP as follows.

$$GDP = C + I + G + (X - M) \quad (1)$$

where, C = consumption, I = investment, G = government spending, X = export value, and M = import value.

Consumption (C) is the value of private consumption, including most expenses that households spent on goods and services (e.g., food, rent, medicine, communication, leisure, and purchasing a new car), while excluding the cost of second-hand cars and new houses. Second-hand cars are not included in consumption of current year's GDP calculations because they were included in the year when they were first sold, which is commonly in the year they were produced. Counting these second-hand items in the current year's GDP cause redundancy, hence these goods are omitted from the current year's GDP calculations (Mankiw, 2019). New houses are counted as an investment rather than consumption as the house owners are able to make profits over housing (McConnell, Brue, & Flynn, 2018). For example, the new houses can be rented and this increases incomes to the landlords. Investment (I) is the value of a private-sector investment in capital goods (e.g., new mine construction, buying computer software, and cost of plant equipment) and household expenses of buying a new house. However, purchasing financial

instruments (e.g., shares or debentures) cannot be counted as an investment or savings. Trading such assets is not included in GDP because it is just a transfer payment where the money is not converted into goods or services and those assets are not directly involved in producing goods or services. Hence, it is not an element of the real economy. Government spending (*G*) is the expenditure of all government consumption that includes the wages of government officials, cost of military equipment, and cost of state investment and excludes transfers such as social benefits or unemployment benefits (Poonsateansup, 2021).

GDP is important to the economy because it provides information about the economy's size and performance so that the economic health of a nation can be indicated by the growth rate of GDP. If GDP is positive, the employment rate tends to increase because many companies recruit more workers and more money has been accumulated. In contrast, if GDP is negative due to the economy shrinking, then there will be a decrease in the employment rate. However, in some circumstances, the growth of GDP might be insufficient to create an adequate amount of jobs for job hunters (Callen, 2020). Even though GDP can indicate the development of a domestic economy, it cannot measure societal well-being because purchasing of goods or services might be a result of poor quality of life or negative impact on society and the environment (Kapoor & Debroy, 2019). However, when GDP is used as an indicator of economic prosperity, it is one of the key factors used by investors before investing because all investors will invest in a country with better economic performance (Poonsateansup, 2021).

2.2. Keynes' consumption theory

Keynes' consumption theory was introduced by a British economist named John Maynard Keynes. The marginal propensity to consume (MPC), one of the significant factors in Keynesian theory, is a metric used to measure induced consumption (Murugasu, Wei, & Hwa, 2013). Based on this theory, the MPC of households affects the total amount of savings and the actual savings: a higher MPC leads to a higher amount of expenses but a lower amount of savings (Rahim & Bahari, 2018). The formula of Keynesian consumption can be expressed as follows:

$$C = a + b\,Yd \tag{2}$$

where, C = total consumption, a = autonomous consumption, b = MPC, Yd = useable income or available income of the household after tax deduction.

Tax is a fiscal tool in the consumption function and total savings are related to the function of savings expressed with the following equation:

$$S = -a + (1 - b)Yd \tag{3}$$

where, S = total savings, a = the constant acting as the autonomous consumption against savings, $(1–b)$ = marginal propensity to the savings (MPS), and Yd = disposable/useable income.

It is also notable that Yd = consumption (C) + + savings (S). This can possibly be confirmed with by adding those two functions $C = a + b\,Yd$ and $S = -a + (1–b)\,Yd$.

According to the function of savings, the MPS has an influence on total savings when there is an increase in household income. In other words, a greater value of MPS will result in higher total savings.

The Keynesian economic theory focuses on using demand-driven rather than depending on the supply side to boost the extension of economic activities. Therefore, this theory can be used by a government to adopt a suitable macroeconomic policy for raising GDP growth. The importance of Keynesian theory is that it is able to overcome economic contractions by increasing consumer demand to boost private consumption. The increase in private consumption will lead to other economic activities, such as employment, production growth, and an increase in wages (Charoonwongniramo, 2009).

2.3. Multiplier effect

A multiplier is a ratio of change in final increase in national income or real GDP arising from a change in spending which includes investment, government spending, and value of exports. When people spend money on a country's economy, there will be a multiplier effect because an injection of extra income results in an increase in spending, leading to more income (Von Allmen, 2012). A multiplier can be calculated using the following equation:

$$K = \Delta Y/\Delta I \tag{4}$$

where, K = multiplier, ΔY = change in real GDP, and ΔI = change in spending.

While emphasizing consumption and savings, MPC (marginal propensity to consumption) or MPS (marginal propensity to save) have an influence on the size of the multiplier. It is noted that when someone spends income, this spending will become another person's income, and so on (Von Allmen, 2012). The formula used to calculate the multiplier based on marginal propensities follows:

$$K = 1/(1 - MPC) \tag{5}$$

2.4. Previous studies and contributions of the present study

There are a number of studies related to the multiplier effect, consumption theory, and online shopping. The multiplier effect has been examined in relation to particular topics such as economic growth (Putriani, Ghani, & Kartiwi, 2020), tourism (Sevatapukka, 2018), and education (Crul et al., 2017; De Ridder et al., 2020). Keynes' consumption theory and its application have been also explored; for example, Rahim and Bahari (2018) studied consumption theory from an Islamic perspective by comparing Keynes' theory and the functions of Islamic consumption. Many studies have emphasized the impacts of e-commerce and online shopping (Wasusirikul & Stasiewski, 2016); however, the integrated study of the multiplier effect, private consumption, and e-commerce in Thailand has not yet been undertaken. This study, therefore, fills a gap by exploring the multiplier effect of e-consumption in Thailand in 2020. Here, e-consumption is represented by purchases in 10 categories of goods and services via online

platforms among Thailand consumers, and this study examined the factors influencing such online consumption. The multiplier of e-consumption was estimated based on e-commerce revenue and expenses. This study can therefore contribute to enhancing private consumption and e-commerce in Thailand, which could lead to the recovery of Thailand's economy following the COVID-19 crisis.

3. RESEARCH METHODOLOGY

This study examines the patterns of consumption, emphasizing the consumption of merchants and services on every online platform in Thailand. E-commerce revenue and expenses were investigated to estimate marginal propensity to consume (MPC), which was used in the calculation of the direct-multiplier effect (note that the indirect effect was not included in this study).

This study is based on secondary data and an online survey. The secondary data were the national income (NI) of Thailand as reported by the Office of the National Economic and Social Development Council of Thailand (2018), while the primary data were collected from 864 respondents across six regions of Thailand via an online survey. The respondents were selected by convenient sampling. The population in this study is a group of internet users who have shopped and sold merchants via online platforms. The data were analysed by ANCOVA to test the hypothesis. The dependent variable is monthly spending in online shopping and the independent variable is demographic factors, including gender, age, education, career, monthly income, saving, and online revenue.

The category of e-consumption in this study is divided into 10 categories, which are adjusted on a basis of private consumption expenditure reported by the National Accounts Division, Office of the National Economic and Social Development Council of Thailand (2020), as follows:

- Food, beverage, and tobacco;
- Accommodation and electric appliance;
- Personal vehicle and transportation;
- Clothes, shoes, and personal items;
- Communication;
- Education;
- Pharmacies and medical supplies;
- Entertainment and travelling;
- Religious practices and donations;
- Non-consumption expenditures.

Actually, this study can be based on completely secondary data as all the significant values of factors included in a consumption equation are already provided in the reliable national documents such as the NESDC Economic Report of Thai economic performance in Q3 and outlook for 2020 reported by Macroeconomic Strategy and Planning Division, Office of the National Economic and Social Development Council of Thailand (2020). However, the data reported in such documents are not updated in real-time; hence using an online survey offers the most recent data, which is suitable for e-consumption.

4. RESULTS

It is notable that the LINE social media network is used by the majority of the respondents, accounting for about 98.6%; followed by Facebook with about 95.3%; Instagram with about 89.6%; and YouTube with about 88.2%; while Twitter and Pinterest show a far lower proportion of usage, amounting to about 64.1% and 40.4%, respectively. WhatsApp is used by only about 18.4% of people, presenting the lowest proportion of usage in this sample group (Table 1).

Table 1. The behaviour of social media use

Social media platforms	*Usage*	
	Yes	*No*
LINE	98.6	1.4
Facebook	95.3	4.7
Instagram	89.6	10.4
YouTube	88.2	11.8
Twitter	64.1	35.9
Pinterest	40.4	59.6
WhatsApp	18.4	81.6

Most goods and services were purchased by traditional methods (i.e., offline purchase) and the proportions of offline purchases are more than two times those of online purchases, except for clothes, shoes and personal items, and communication. Even though the percentage of offline shopping in clothes, shoes, and personal items, and goods and services in communication are higher than online purchases, there is just a slight difference between the proportions of online and offline purchases in these categories. In contrast, goods and services in entertainment and travelling show the highest level about 43% in online purchases, which is almost about 12% higher than offline purchases (Table 2).

Table 2. The customer patterns in purchasing goods and services

Categories of goods and services	*Purchasing patterns*			
	Online	*Offline*	*Both patterns*	*Not purchases*
Foods, beverage and tobacco	21.9	47.5	20.0	10.5
Accommodation and electric appliances	21.0	58.8	13.8	6.4
Vehicles and transportation	15.9	58.5	15.5	10.1
Clothes, shoes, and personal items	30.0	45.5	21.5	3.0
Communication	36.8	38.9	19.2	5.1
Education	21.1	48.8	23.8	6.3
Pharmacies and medical supplies	15.2	61.4	14.4	9.0
Entertainment and travelling	43.0	31.1	18.5	7.4
Religious practices and donations	15.5	50.3	16.4	17.8
Non-consumption expenditures	24.0	47.9	17.4	10.7

Levene's test results (Table 3) shows that the variances for purchasing online goods and services in a month were not equal, where $F(40,454) = 67.543$, $p = 0.000$ and it is significant even at the 1% level ($p < 0.01$) for the dependent variable, and thus, the null hypothesis of equal

population variances is rejected. Consequently, this variable violates the homogeneity of variance assumption needed for an ANCOVA. However, this is only expected to slightly affect the data reliability, hence, ANCOVA can be run on actual data (Table 4).

Table 3. Variance of the dependent variable as tested by Levene's test of equality of error variances

F	*df1*	*df2*	*Sig.*
67.543	40	454	0.000

*Note: (a) Design: Intercept + Gender + Age + Education + Career + Income + Saving + Revenue + Gender * Age * Education * Care er * Income * Saving * Revenue.*
(b) Dependent variable: monthly spend in online shopping including travelling, accommodation booking, and flight ticket (if no any purchases = 0).

While considering the model (Gender * Age * Education * Career * Income * Saving * Revenue as in Table 4), there is a statistically significant interaction at the level of 0.018 ($p < 0.05$). The results show that only the education and savings are significant at the 5% level ($p = 0.017$ and $p = 0.023$, respectively). Therefore, education and savings are statistically significant for e-consumption. Online revenue, a covariate, has no statistically significant difference at the 5% level ($p = 0.810 > 0.05$). Consequently, this model can explain about 14.1% variation of dependent variable with the independent variable: e-consumption (adjusted R-squared = 0.141 = 14.1%). This means that there is about 85.9% variability of the dependent variable that needs to be explained. In other words, this model does not effectively explain the variability of the dependent variable.

Table 4. Factors affecting e-consumption tested by tests of between-subject effects

Source	*Type III sum of squares*	*df*	*Mean square*	*F*	*Sig.*	*Partial eta squared*
Corrected model	10 838 591 328.397(a)	77	140 760 926.343	1.401	0.018	0.142
Intercept	249 985 636.634	1	249 985 636.634	2.487	0.115	0.004
Gender	254 531 357.361	2	127 265 678.680	1.266	0.283	0.004
Age	1 025 862 415.870	5	205 172 483.174	2.041	0.071	0.015
Education	1 158 797 027.103	3	386 265 675.701	3.843	0.010	0.017
Career	685 644 335.121	6	114 274 055.854	1.137	0.339	0.010
Income	331 206 887.861	5	66 241 377.572	0.659	0.655	0.005
Saving	1 549 167 796.564	4	387 291 949.141	3.853	0.004	0.023
Online revenue	5 841 194.634	1	5 841 194.634	0.058	0.810	0.000
Gender * Age * Education * Career * Income * Saving * Revenue	1 231 641 991.513	51	24 149 842.971	0.240	1.000	0.018
Error	65 429 965 749.959	651	100 506 859.831			
Total	81 123 957 547.000	729				
Corrected total	76 268 557 078.357	728				

Note: (a) R-squared = 0.142 (Adjusted R-squared = 0.141).
(b) Dependent variable: monthly spend in online shopping (Categories of goods and services) including travelling, accommodation booking and flight ticket (if no any purchases = 0).

As the education and savings are statistically significant for e-consumption, each term in these two groups is therefore considered for further analyses. The results of the extended analyses show that people who have obtained a Bachelor's degree are statistically significant even at the 1% level ($p = 0.000 < 0.01$) for e-consumption. In addition, the people who have savings of 5,000–10,000 baht are also statistically significant at the 5% level ($p = 0.033 < 0.05$) for e-consumption (Table 5).

Table 5. Comparison of individual dependent variables affecting e-consumption

Parameter	*B*	*Std. error*	*t*	*Sig.*	*Partial eta squared*
Intercept	-130 338.812	161 245.628	-0.808	0.419	0.001
Education					
Lower than high school	80 648.333	101 404.650	0.795	0.427	0.001
High school	-10 670.644	88 617.762	-0.120	0.904	0.000
Bachelor degree	99 500.000	18 048.600	5.513	0.000	0.053
Saving (Thailand baht)					
Lower than 5,000	138 272.423	187 411.357	0.738	0.461	0.001
5,000–10,000	-137 905.833	64 446.391	-2.140	0.033	0.008
10,001–15,000	-44 233.333	53 363.048	-0.829	0.408	0.001
15,001 and over	212 472.145	173 522.495	1.224	0.221	0.003

It is noted that that the e-commerce consumption (16.83%) is higher than the e-commerce revenue (11.40%) as calculated from total income (Table 6). This means that most customers spent money from their regular income rather than e-commerce revenue.

Table 6. Terms used in calculation of multiplier

Economic activities	*Percentage*	*Mean*	*Std. deviation*
Total revenue	100.00	15330.14	7873.83
E-commerce revenue	11.40	1748.27	10137.20
E-commerce consumption	16.83	2579.97	10228.45
Other expenses	62.18	9532.16	8313.96
Saving	20.99	3218.01	5016.34

The calculation of MPC of e-consumption in this study is shown in equation (6):

$$b = Consumption/Income \quad (6)$$

where, b = MPC.

Using the data in Table 6 and equation (6), the value of b can be calculated as shown in equation (7).

$$\begin{aligned} b &= E - commerce\ consumption/Total\ income \\ &= 2{,}579.97/15{,}330.14 \\ &= 0.17 \end{aligned} \quad (7)$$

So that the multiplier of e-consumption (Kc) can be calculated as shown in equation (8) below:

$$\begin{aligned} Kc &= 1/(1-b) \\ &= 1/(1-0.17) \\ &= 1/0.83 \\ &= 1.21 \text{ (rounded up)} \end{aligned} \quad (8)$$

The multiplier of e-consumption (Kc) in this study equals to about 1.21 (i.e., Kc = 1.21). This means that when e-consumption raises 1 unit, the GDP will grow 1.21 times.

5. DISCUSSION

The findings in this study show that most goods and services were purchased offline and the proportions of offline purchases are more than two times those of online purchases. It can be seen that the proportion of offline shopping is far higher than that of online shopping. In particular, Thailand has an e-commerce spending of only about 2% of total retail spendings (Muangtum, 2020), while in contrast e-commerce spending of China accounts for 25.70% of total retail spending (Department of International Trade Promotion, Ministry of Commerce of Thailand, 2020). Therefore, Muangtum (2020) indicates that the proportion of e-consumption in Thailand is likely to grow consistently, and is expected to increase by eight times. This can also be seen in our findings that goods and services in entertainment and travelling show the highest percentage of online purchases in Thailand.

The model that we used in this study shows the significance of education and savings for e-consumption. Education might have a direct influence on online shopping, for example, learning and understanding the details of a product thoroughly. Hence, people with a higher level of education will be more likely to have positive attitudes towards online shopping. Mityko (2012) indicates that education impacts the customer's perception of a product sold on online platforms, both directly and indirectly. Other factors such as income might be affected directly by education. Consequently, it influences the perception of a product. Moreover, education level might indirectly influence the online purchase (e.g., impacting web experience of a customer or decision-making in online purchase) because it requires various computer and technological skills (e.g., use of credit and/or debit cards), which can be somewhat complicated. Savings can also impact e-consumption because people who have saved more money tend to purchase online goods and services rather than those who lack savings.

The multiplier of e-consumption in this study equals about 1.21. This means that when e-consumption raises 1 unit, GDP will grow about 1.21 times. The multiplier of e-consumption in this study is higher than the multiplier of Thailand's budget (0.4) amid the COVID-19 outbreak to support households with the cost of living; the multiplier of public consumption (1.0); and the multiplier of government investment spending (0.8) as in Khatphitthaya, Annonjarn, and Tonghui (2015). Therefore, it can be concluded that private consumption shows a higher significance to the Thai economy over the total public consumption because Thai public consumption relies on the foreign sector. Therefore, when the foreign sector is generally affected by a dramatic crisis, such as the COVID-19 pandemic, economic and international trade will, unfortunately, be affected in Thailand in particular.

Based on this study, it is recommended that private consumption should be encouraged to improve the strength of the Thailand economic system given that the foreign sector might not recover completely within a few days of the lifting of the COVID-19 restrictions and lock-downs. E-consumption has grown consistently during the COVID-19 crisis and in the long run, there is considerable room for growth in the Thailand e-commerce market. Therefore, ICT infrastructure development (e.g., online payments, e-retail platform, and web security) should be prioritized to support e-consumption. This will improve the customer's experience of online shopping, thus leading to an increase in e-consumption. Because education is one of the significant factors that can boost e-consumption in Thailand, human skills need to be developed. People might be upskilled and reskilled effectively when skill development is involved in formal education because skill improvement takes time. Saving is another factor affecting e-consumption. Hence, the public sector should encourage people to save more money because this will boost online shopping. To increase savings, people have to earn more income. However, unemployment has increased during the COVID-19 crisis, thus the government might support online retail to enable more people to earn extra income via online platforms.

6. CONCLUSION

Although there was a rapid growth of e-commerce in Thailand in 2020, the findings of this study indicate that the proportion of online shopping among Thailand customers remains far lower than for offline shopping. It can therefore be assumed that traditional shopping practices still dominate Thailand's markets. However, merchants and services in the entertainment and travel sectors have the highest percentage of online spending among Thailand consumers. The levels of education and savings also have significance for e-consumption in Thailand, i.e., people with a higher level of education and/or more savings are more likely to shop online. The multiplier of e-consumption in this study was about 1.21, which indicates that when e-consumption increases by 1 unit, GDP will increase by a factor of 1.21. The multiplier of e-consumption in this study

is higher than the multiplier of Thailand's budget amid the COVID-19 outbreak to support households with the cost of living, public consumption, and government investment spending.

Private consumption had a higher significance for the Thailand economy over total public consumption because Thailand's public consumption relies on the foreign sector. Therefore, when the foreign sector of Thailand is affected by a dramatic crisis, her economic and international trade will, unfortunately, be affected adversely. Because Thailand's private consumption and e-commerce have grown consistently, especially during the COVID-19 outbreak, the Thailand government, other related organizations, and private companies could enhance household spending and e-consumption in Thailand by developing ICT infrastructure for online shopping platforms, improving human skills, and encouraging people to save more money. This would boost e-consumption, leading to the recovery of the Thai economy in the aftermath of the COVID-19 crisis. This study forwards these findings and suggestions to the respective policymakers of Thailand to direct Thailand's economy towards sustainability.

The obtained data in this study were the 1-month history of customers purchasing goods and services and it is the main limitation of this study. If the data had been collected longer than this period of time, the participants would have unrecognized their purchasing histories correctly, leading to inaccurate data collection. Moreover, the consumption behaviour of consumers in the first quarter of the year could differ from that of the last quarter in the same year. Therefore, the results collected from different periods of time will probably show different outcomes. However, the total expenditure or budget of one-year consumption is likely to be similar; and hence, the annual expenditure can be estimated. Another distinct drawback of this paper that needs to be pointed out is a small percentage of adjusted R-square of the model used in the analysis, reflecting the low effectiveness of the model in explaining the variability of the dependent variable. This might be caused by the improper selection of dependent variables. The dependent variables in this study are personal variables that can represent customers' consumption in a small scale or microeconomics. However, the world economy in the reality is explained by bigger scale economics or macroeconomics, hence the factors in macroeconomics such as factors regarding COVID-19 pandemic need to be considered to explain the national e-consumption. For future studies, it is recommended to include such factors in the analysis to increase the percentage in explaining the variability of the dependent variable of the model.

This study is useful as it can be a baseline for other following studies in studying the impacts of e-consumption on GDP growth. The calculated multiplier of e-consumption in this study might be used to compare to other multipliers to explore the impacts of other spendings on the GDP growth, for example, the impacts of the federal budget, public consumption, and government investment spending. The positive value of the multiplier can also indicate that e-consumption can contribute to the national GDP and drive economic growth and this could be a guideline for some studies to create effective economic policies that can improve domestic economic growth.

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