The Role of the Retail Sector in the Taiwanese Macroeconomy

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1. Introduction

Taiwan is one of the most dynamic economies in the region, driven largely by industrial manufacturing, and especially exports of electronics, such as semiconductors, machinery, and petrochemicals. This heavy dependence on exports exposes some volatility in the economy due to fluctuations in global demand, such as increasing competition with China.

An important landmark was the signing of the Economic Cooperation Framework Agreement (ECFA) with China in June 2010. In July 2013, Taiwan signed a free trade deal with New Zealand—Taipei's first-ever with a country with which it does not maintain diplomatic relations —and, in November of the same year, inked a trade pact with Singapore. However, follow-on components of the ECFA, including a signed agreement on trade in services, and negotiations on trade in goods and dispute resolution, have stalled. In early 2014, the government bowed to public demand and proposed a new law governing the oversight of cross-Strait agreements, before any additional deals with China were implemented; the legislature has yet to vote on such legislation, leaving the future of ECFA uncertain (Central Intelligence Agency, 2018.) Taiwan moves to greater economic integration with South and Southeast Asia and has also expressed interest in Taiwan joining the Trans-Pacific Partnership (TPP) as well as bilateral trade deals with partners such as the US.

The TPP was thrown into limbo in early 2017, when then-US President Donald Trump pulled the United States out of the pact. The grouping, which was renamed the CPTPP, currently links Canada, Australia, Brunei, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore, and Vietnam. Taiwan is excluded from many international bodies because of China's insistence that it is part of "one-China" rather than a separate country. China views Taiwan as its own territory. But Taiwan is a member of the World Trade Organization and the Asia-Pacific Economic Cooperation (APEC) grouping. In September 2021, Taiwan has

formally applied to join the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), the government said on Wednesday (September 22, 2021), less than a week after China said it, too, had submitted an application (Reuters, 2021).

Largely because of the low-level fertility rate (just over one child per woman) or the aging of the population (people over 65 made up 16 percent of the population in 2020) raising the prospect of future labor shortages, falling domestic demand, and due to all of these, declining tax revenues. The restricted labor force also explains why Taiwan focuses on intensive skill-driven industries and services. Thanks to the economic policy, the country runs a trade surplus compared with many economies, so its foreign reserves are the world's fifth largest.

The relationship with China is a very important issue. China became Taiwan's second-largest source of imports after Japan, and China is also the island's number one destination for foreign direct investment. Closer economic links with the Mainland, PRC, and China provide opportunities for Taiwan's economy, but also pose challenges as political differences remain unresolved and China's economic growth is slowing, and, besides, the discussion of the nature of the political relationship is not part of this survey.

This study covers topics as follows:

At first, Asian retail trends are described which demonstrate the importance of the digital era, and its effect on the expansion of e-commerce.

One of the presented research methods and considered theoretical schools stems from the Keynesian multiplier, which is the ratio between output variation and the initial exogenous variation of aggregate demand (Benassy-Quere et al., 2018). The primary assumption is on the Keynesian multiplier that the consumption is the linear function of current income. The marginal propensity to consume means that out of one additional US dollar of disposable income, people spend and save some.

The other used method to analyze the role of the retail sector in Taiwan is the input-output model. The Leontief input-output model was formulated as a generalized econometric complementary problem. Input conditions for the existence of solutions are given, and solution results are based on assumptions. An application of the model to figure out the regional effects is proposed. This is a basic

introduction to the input-output analysis, which was founded by Wassily Leontief in the 1930s (Leontief, 1986).

The main goal of the research is to examine and analyze the role of the retail sector in the macroeconomy and help to understand how retail consumption contributes to the economic growth in Taiwan.

2. Methods of Research

The analyzed macroeconomic issues are at the center of Taiwanese economic policies. Many types of data are used to measure the performance of the Taiwanese economy. In this research, three macroeconomic variables are especially important: real gross domestic product (GDP), the income which accounts for the sources of households' spending and savings, and the consumption denoting the money people spent for buying goods and services. It is examined how these variables are determined, how they change over time, and how they interact with one another, and how the retail sector's performance developed on the macro level. A model is worked out to help explain economic variables, such as GDP, income, and consumption. The used economic models illustrate the relationships among the retail consumption's variables. Two kinds of variables will be examined from the retail point of view: endogenous variables and exogenous variables. Endogenous variables are those that a model tries to explain, such as retail spending. Exogenous variables are those that a model takes as given, such as income. The goal of the presented models is to show how the exogenous variables affect the endogenous ones, although the retail consumption on one side comes from outside the model, such as in the multiplier analysis, and the other side, serves as the model's input, whereas endogenous variables are determined inside the model, so the retail consumption is the model's output, such as in equilibrium calculation.

The main sources of secondary data analysis are provided by the National Statistics of Republic of China (Taiwan), the Ministry of Economic Affairs of the Republic of China, the GfK Retail and Technology Taiwan Ltd., the World Economic Forum: The Global Competitiveness Report 2017-2018, the Nielsen Company: Quarter By Numbers, the Fung Business Intelligence: Asia Retail, TEMAX, and Reports[1].

1 National Statistics of Republic of China (Taiwan) (https://eng.stat.gov.tw/mp.asp?mp=5); Ministry of Economic Affairs of the Republic of China (https://www.google.com/search?q=Ministry+of+Eco-

The role of the retail and the influence of this sector are analyzed in terms of methods, such as trend analysis, benchmark analysis, Keynesian consumption theory and the equilibrium, as well as the multiplier effect of consumption based on the input-output table.

This research presents many different methods that address different questions and make different assumptions as can be found in the following parts:

2.1. Consumption Analysis

This subchapter analyzes how Taiwanese households decide how much of their income can be used for consumption today and how much to spend in retail? This microeconomic question addresses the answer to macroeconomic consequences. It is examined how households' consumption decisions affect the way the economy will fare in the long run in Taiwan. The analysis is part of a study of consumption that relies on techniques of data regression analysis. The aggregate data on the behavior of the overall economy come from the national income accounts of the National Statistics of the Republic of China.

Keynes conjectured that the marginal propensity to consume—the amount consumed out of an additional dollar of income—is between zero and one (Mankiw, 2003). The ratio of consumption to income is called the average propensity to consume, so income is the primary determinant of consumption. The consumption, and therefore the retail spending as well, is determined by the level of production and the distributed income to households, as disposable income. One of the main goals of the research is to show how economic equilibrium changes - in the market for goods and services in Taiwan - due to retail and consumption. The following equations summarize the examinations of the demand for goods and services in the research:

$$Y = C + I + G.$$
$$C = C(Y - T).$$

nomic+Affairs+of+the+Republic+of+China&rlz=1C1GCEU_huHU898HU898&oq=Ministry+of+Economic+Affairs+of+the+Republic+of+China&aqs=chrome..69i57j0i22i30.437j0j4&sourceid=chrome&ie=UTF-8); GfK Retail and Technology Taiwan Ltd (https://www.gfk.com/home); World Economic Forum: The Global Competitiveness Report 2017-2018 (https://www.weforum.org/reports/the-global-competitiveness-report-2017-2018/); The Nielsen Company, Quarter By Numbers (https://nielseniq.com/wp-content/uploads/sites/3/2019/04/quarter-by-numbers-sellsheet-2018-1.pdf); Fung Business Intelligence, Asia Retail (https://www.fbicgroup.com/).

The demand of the economy's output is measured by GDP, which comes from partly consumption, and consumption depends on disposable income; retail spending is the endogenous variable from this point of view.

2.2. Input-Output Model to Retail Sector Analysis

In the applied Leontief's input-output model, there are four measures of changes in regional economic activity that can be estimated: gross output of different sectors, value-added, earnings, and employment. The crucial question is how the retail sectors' intermediate relationships can be quantified in the national input-output model. The method applied in this research is to use the national level sector metrics (such information is available in the Statistical Office database), and calculated coefficients can be figured out from national level statistics. In addition to understanding the effect of assumptions in the input-output model, it is important to quantify the macro level effects by using the model's multipliers. Each of the additional one New Taiwan Dollar (TWD) of demand for the buying of a sector results in both indirect and direct income effects on the economy as a whole, so the linkage between the initial spending and the total effects generated by the spending is known as the multiplier effect of the sector, or more generally, as the impact of the sector on the economy as a whole (O'Connor – Henry, 1975). For this reason, this study of multipliers could be called an impact analysis.

In this survey, multipliers are used to figure out the secondary effects of the retail sector in Taiwan. Indirect effects are the changes in sales, jobs, and income within supplier industries in the country, i.e., businesses that supply goods and services to tourism-related firms. The economic mechanism that causes an initial reaction to be amplified by following effects among suppliers is the examined indirect multiplier effect, regardless of whether the shock triggers change in technology or in the financial market (Acemoglu et al., 2016). For example, retail companies purchase a variety of goods and services in Taiwan in order to sell products, these indirect effects are described by Type I multipliers.

$$Type\ I\ sales\ multiplier\ \ =\ \frac{(direct\ sales + indirect\ sales)}{direct\ sales}$$

The additional income that ultimately gets to households is called disposable income, which explains the induced effects. These evoked effects are the changes in income in Taiwan, resulting in more consumption because of retail spending.

Employees in the service sectors and supplier industries are spending their income in Taiwan, thus causing additional sales and economic activity. Type II multipliers integrate both indirect and induced effects.

$$Type\ II\ sales\ multiplier\ =\ \frac{(direct\ sales + indirect\ sales + induced\ sales)}{direct\ sales}$$

The main findings of the research are compared to benchmark countries where the statistical methods are not differentiated resulting in significant distortion in analysis.

3. Overview of the Retail Commerce in Asia

Asia comprises many countries, each with different geographic, economic, political, cultural, and social spheres. Consumer preferences and buying habits are different; there is no such thing as an "average Asian consumer". However, rising disposable incomes across the region have given rise to a new group of consumers—the fast-growing middle class. Asia's consumer market is and will continue to be driven by preferences of the exploding middle-class, particularly the growing, influential younger consumers in the region.

The rise of e-commerce has redefined shopping and revolutionized retailing in the APAC (Asia Pacific) region. The research findings prove, that APAC is better positioned and hosts five of the top ten most attractive retail markets globally (Deutsche Bank Market Research, 2017). Structural issues such as consumption upgrades, technological advancement, and cyclical trends are pulling APAC's offline brands/retailers in various directions. Consumers in China (including Taiwan) and South Korea are fully embracing online, with those in Singapore and Hong Kong lagging, while Japan and Australia are moving at a tepid pace as preference for offline retail remains high. Consequently, retailers in China, Taiwan, and Korea need to be proactive by adopting an omnichannel (integrated online/ offline) strategy in order to stay relevant, while their counterparts in other markets face less imminent pressure and are able to co-exist with rising online retail (in selected products) or to develop online on their own.

Department stores have felt most severely the rise of e-commerce, with its portion of total retail sales shrinking from 10-12 percent to 3-9 percent across countries between 2007 and 2016. According to statistics from the Ministry of Finance,

there were just 713 department stores in Taiwan as of September 2020, 40 fewer than in 2019. Few brands/retailers in APAC have demonstrated successful online strategies. Fast Retailing's vertical model and self-run store format have allowed it to develop a seamless online module.

In the digital era, consumers are more connected, tech-savvy, mobile, and socially fluid. They demand personal products and services, look for greater satisfaction in life experience, and have a strong desire for convenience and immediacy, rather than merely static material possessions.

3.1. Retail Snapshot of Selected Countries

This part gives a brief outlook of selected countries' retail performances. The main figures for retail sales and internet sales of selected Asian economies are shown in Table 1.

Table 1: Retail sales and Internet sales of selected economies in Asia, 2016

	Retail sales (USD billion)		YoY growth (%)		Internet sales (USD billion)		YoY growth (%)		Share of internet sales in retail sales (%)	
	2016	2020	2016	2020	2016	2020	2016	2020	2016	2020
China	2,016.7	5,681.0	8.1	12.42	347.4	1,343.5	33.9	11.8	17.2	24.9
Japan	947.2	1,318.0	0.9	-0.3	67.7	150.13	8.5	6.24	7.1	9.75
South Korea	234.3	403.0	7.8	5.56	43.0	80.0	20.4	22.3	18.4	32.0
Taiwan	90.8	130.07	2.6	1.38	8.9	16.2	12.5	19.0	9.8	n.d.
Singapore	21.9	27.0	-1.7	-15.3	1.1	3.2	33.1	40.7	4.8	14.0

Source: Euromonitor International; compiled by Fung Business Intelligence (Data of 2016); globaldata.com; marketresearch.com; sbr.com.sg; ceicdata.com; unctad.org (Data of 2020).

China is the largest country in the region, notwithstanding medium-level living standards (Table 1), it is the leader in e-commerce (especially mobile commerce), and the offline retailers remain the victims. It is expected that the future supply of retail space in China remains ample even after fast growth over the past decade,

2 Forecast for 2021.
3 According to data of JP Morgan.
4 According to data of JP Morgan.
5 Expected by 2019.
6 Based on data the Ministry of Trade, Industry and Energy of South Korea.
7 2019.
8 Average from 1/2000 to 7/2021.

but the rapid growth of e-commerce (33.9 percent in 2016, and 10.6 percent in 2020) will continue to put overall unit rent and rental yield under pressure. The whole e-commerce sales added up to 1,345.5 billion USD in 2020 and 49 percent growth is expected by 2025, based on data from statista.com. Fifty-two percent of China's retail sales derive from e-commerce in 2021, up from 44.8 percent in 2020, China being the first country to have e-commerce make up more than half of its total retail sales (Wilson, 2021). The increase of the relatively high-level traditional retail sales indicates that mall operators with strong executive power will continue to grasp the strong demand through proactively adapting to the new competitive landscape by adjusting their tenant mix (e.g., more F&B and experience shops that online shops cannot replicate).

The Covid-19 pandemic reshaped China's economy as well. Digitalization has accelerated in the B2C sector and further growth is expected. China is a leader in this field of innovation. Shortening of value chains affects export activities in the long term. With the headway of digitalization, international competitiveness will increase. In communication, the role of social media will strengthen.

In Japan, new store openings have slowed down due to the rise of construction and labor costs, as well as to the rebalancing of offline/online store portfolios by current players. Traditional retail in department stores has been particularly affected on both sales and earnings by the growth of e-commerce, while their fall has already begun since the beginning of the deregulation of location controls on large commercial facilities since 1990. The threat of e-commerce has also reached areas such as shopping centers and train-station fashion buildings, which used to be considered relatively secure (Deutsche Bank Market Research, 2017). The further growth of the retail sector is driven by technology and the increasing young population. With the rising GDP, the purchasing power and disposable income are rising as well. The expansion of the retail industry is relatively low in the APAC region. The development of Japan is adversely affected by high operating costs, the disadvantageous availability of geographical area, and the aging population (average age is 47.7 years) (JP Morgan, 2021). The Olympic Games of 2020 enhanced the retail turnover, but this was a temporary effect. E-commerce is expected to expand; especially mobile commerce will increase in a few years.

The South Korean e-commerce market is estimated to expand by 20.2 percent compound annual growth rate (CAGR) until 2021, significantly outgrowing the overall retail industry. It is expected that the Korean e-commerce market will remain fragmented with no clear winner, while a number of leading players

compete, due to non-dominant players, limited merger and acquisition (M&A) opportunities, and solid financial capabilities of major traditional retail participants. The offline sales rose by 8.6 percent in the first half of 2021, and sales at the hypermarket chains edged down by 3.0 percent as all item categories decreased (in the whole year of 2020). South Korea is one of the most developed e-commerce markets globally and due to the Covid-19 pandemic, the growth of this segment will further accelerate. Online retailers experienced the largest growth in sales (up by 27.2 percent) since February 2020 mainly because of the year-end discount events and a continued an upward trend in online shopping based on the data of the Ministry of Trade, Industry and Energy of South Korea.

In Singapore, retail sales declined in 2016, but later, the rise in retail sales was mirrored by an aggressive build-out of retail space. The change in sales was very volatile in 2020. Since the drop of the Covid-19 cases in 2020, the retail sales have been growing by 20.7 percent year-over-year until June 2021, and the CAGR also raised by 2.3 percent between 1986 and 2021.

Singapore continues to be challenged by growing e-commerce and abundant supply. The recovery in the underlying economy and the positive outlook for the residential market should see a cyclical recovery in retail in Singapore. Because of the very concentrated traditional retail department stores, the share of e-commerce is relatively low (4.8 percent) compared to other regional countries, but because of the effects of the Covid-19 pandemic it is still growing.

Very relevant is the difference between traditional and internet selling growth rates discernible in Taiwan. The figures are evaluated separately in Chapter 3.

3.2. Comparison of Asian (APAC) and European Retail Economic Environment

3.2.1. Purchasing Power

The key macroeconomic indicators of selected Asian economies show how GDP changed in 2016 compared to the previous year, and how GDP per capita figures determine the retail consumption (Appendix 1). The retail market in APAC has been driven by increased purchasing power in strong economies, such as China, South Korea, Japan or Taiwan. The Asia Pacific region is anticipated to be at the forefront of global economic growth in the 21st century. Its main cities have historically been the principal drivers and areas for retail investment, however,

across certain countries, most evidently China, there is an increasing shift of activity towards smaller urban regions thanks to growing incomes and improving standards of living. In China, the GDP per capita was 8,313 USD in 2016 (Table 2). Still, this is not a regular trend as other markets in the territory are still more dependent on their main cities.

Table 2: APAC leader countries' data

Countries	GDP growth in % in 2018	GDP growth in % in 2019	GDP growth in % in 2020	GDP per capita in USD in 2018	GDP per capita in USD in 2019	GDP per capita in USD in 2020
Singapore	3.5	1.4	-5.4	66,679	65,641	59,798
Hong Kong	2.9	-1.7	-6.1	48,543	48,355	46,324
Japan	0,6	0.3	-4.8	29,159	40,113	40,146
South Korea	2,9	2,0	-1.0	33,423	31,846	31,489
Taiwan	2.8	2.7	3.1	25,780	25,873	26,910
China	6,8	5.9	2.3	9,977	10,271	10,500

Source: Worldbank, 2021.

Despite the Brexit negotiations in 2017, the European economy had experienced an upturn, which was due in part to moderate increases in private consumption. In 2017, each citizen of the EU-28 countries had an average purchasing power of 16,436 EUR (GfK, 2018). This is equivalent to a nominal increase of 1.9 percent compared to the previous year. Among the EU countries, only Great Britain (-1.5 percent) underwent a purchasing power decline, which is partly a result of the devaluation of the British pound. Great Britain aside, the momentum from previous years continued, resulting in and above the average growth rates, particularly for central and eastern European countries. Romania (+7.8 percent) had the greatest gain in purchasing power. But this country's low per-capita purchasing power (4,556 EUR) demonstrates the persisting immense gap in wealth levels across Europe. The highest values of GDP per capita are listed in Table 3.

Before the Covid-19 pandemic, except for Japan and Taiwan, the Asian GDP growth rates exceeded 3 percent, while in Europe, in the majority of countries, the growth rates were below 3 percent. The relative differences in GDP per capita figures are reflected in purchasing power data as well. Purchasing power corresponds to the population's disposable net income, including government subsidies such as pension payments, unemployment assistance, and child benefit. The households use their purchasing power to cover expenses related to food, accommodation, services, vacations, insurance, private pension plans, and retail purchases. Some low per-capita purchasing power figures demonstrate the persisting

immense gap in wealth levels across both Asia and Europe. For example, with 12,473 EUR per person, Poland's capital city of Warsaw has a higher purchasing power than Spain's Andalusian region (10,985 EUR). This is the case even though Spain's average per-capita purchasing power is more than twice as high as Poland's. In terms of data from 2015, Hong Kong's purchasing power was higher fifteen times (sic), than that of Vietnam.

Table 3: European leader countries' data

Countries	GDP growth in % in 2018	GDP growth in % in 2019	GDP growth in % in 2020	GDP per capita in USD in 2018*	GDP per capita in USD in 2019*	GDP per capita in USD in 2020*
Denmark	2.8	2.1	-2.1	61,599	60,213	60,909
Sweden	2.8	2.9	-2.8	54,589	51,687	51,926
Netherlands	2.4	2.8	-3.8	53,019	52,295	52,304
Austria	2.6	1.4	-6.3	51,453	50,122	48,105
Finland	1.1	1.3	-2.9	50,013	48,712	49,041
Germany	1.1	1.1	-4.6	47,787	46,468	45,724
Belgium	1.8	1.8	-6.3	47,555	46,414	44,594
France	1.9	1.8	-7.9	41,526	40,380	38,625
United Kingdom	1.3	1.4	-9.8*	42,993	42,354	40,285

Source: Eurostat, 2021; *Worldbank, 2021.

The pandemic caused a lot of unexpected changes in the function of the different countries, the efficacy of economies fell back considerably.

Driven by domestic components across Europe's countries, the economic upturn resulted in multiple upward revisions of the prognoses made by economic research institutes for the years after 2017. Increases in consumer expenditures were also anticipated for all European countries in 2018. The former year's growth in demand was able to compensate for stationary, traditional retail's market share losses due to online trade. The pandemic effected changes in this part of the commerce industry as well. Because of the restrictions and home office, the market share of online sales is increasing constantly and further growth is expected in the next few years.

3.2.2. Consumer Confidence

The Consumer Confidence Index measures perceptions of local job prospects, personal finances, and immediate spending intentions. When the Consumer confidence Index level is above or below the baseline of 100, it indicates optimism and pessimism, respectively. In this survey, the used index and other findings

related to consumer confidence are based on data from the Nielsen Global Survey of Consumer Confidence and Spending Intentions.

Europe achieved a consumer confidence increase of five points in the second quarter of 2017, reaching an index score of 85. The job outlook surged six percentage points to 37 percent, personal financial sentiment rose three percentage points to 45 percent, and immediate spending intentions increased two percentage points to 36 percent. Terrorism continued to be a leading concern for Europeans.

Confidence in the Asia-Pacific region strengthened modestly, rising three points to 114 in Q2 2017. Sixty-seven percent of respondents in the region said they expected their personal finances to be good or excellent in the coming year, up to three percentage points from the fourth quarter of 2016. Nearly as many (64 percent) expressed optimism about job prospects in the year ahead, an increase of one percentage point from the fourth quarter of 2016. More than half of regional respondents (52 percent) said it is a good or excellent time to buy the things they want and need, which represents no change from the fourth quarter of 2016. In the Asia-Pacific region, concerns about the economy decreased five percentage points to 27 percent in the second quarter of 2017. The share of respondents expressing fears about job security also declined three percentage points to 20 percent. Concern increased around health (27 percent, up to two percentage points), work/life balance (26 percent, up to three percentage points), parents' welfare and happiness (16 percent, up to one percentage point), and children's education and welfare (13 percent, up to one percentage point). India held the second highest index in the Asia Pacific, remaining one of the most optimistic markets in the region and globally. Meanwhile, among the region's developed economies, confidence increased significantly in South Korea (63, up 20 points) and Japan (87, up 13 points). In Hong Kong (102), Taiwan (79), and Singapore (89), confidence increased by nine, six, and four points, respectively (Nielsen, 2017).

To sum up, in Asian countries—similarly to most European regions—the traditional retail has acquired a new function to rise of omnichannel strategies: Attractive retail spaces are important no longer just for their ability to generate store turnover, but also for their role as promotional vehicles for the associated online stores, as we have shown in chapter 2.2. Direct store-to-web turnover is just one aspect of this phenomenon in both regions. The illustrations show that a traditional retail presence boosts brand awareness among customers, which can lead to above-average online turnover in the affected areas of the retail sites. Retailers can consider future expected parameters when evaluating the turnover potential

of retail spaces. As in the case of increasing GDP per capita, sales provision varies between the two continents. In the majority of Asian countries, the growing rates of national output indicators exceed the figures of the European average. In both continents, restrictive protectionist tendencies can slow down the expansion of international retailers. Dynamic growth in sales area productivity also counterbalanced to some degree the rising rental costs in tight commercial real estate markets in Asian countries. Rising turnover accompanied by a simultaneous decline in retail space increased sales area productivity. Although development stagnated due to the Covid-19 pandemic, it is expected to continue growing.

4. Analysis of the Taiwanese Commerce

In this chapter the authors give an in-depth analysis of the macroeconomic background of the Taiwanese retail sector, demonstrate the resources of economic growth, elaborate on how heavily the economic environment influences consumption, as well as show the share of retail spending, and the way the retail structure changed in the past years.

Taiwan's economy benefited from a favorable macroeconomic context. This could be partly explained by the stabilization of the regional financial market after the volatility of late 2016, although the recent escalation of tensions in the Korean peninsula has again raised uncertainty. Taiwanese global competitiveness ranked twelfth in 2019 (fifteenth in 2017-2018 and fourteenth in 2016-2017) (World Economic Forum, 2018). The compounded average growth rate of GDP was 2.5 percent in the past five years, and one of the main pillars of the national competitiveness is the macroeconomic stability and the low unemployment rate, which was 4.3 percent in July 2021.

Taiwanese exports are rebounding at a healthy pace, setting the stage for stronger economic growth. In recent years, exports to China and the rest of Asia have risen strongly, and those to the United States have also grown at a strong pace, albeit from a smaller base.

Export destinations of Taiwan can be seen in Figure 1.

Figure 1: Export destination of Taiwan, 12-month rolling, 2018
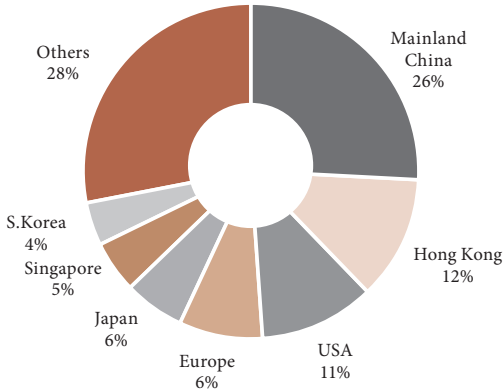
Source: ING, Bloomberg.

The Chinese story is the most important. China is Taiwan's principal trading partner. Indeed, Taiwanese exports to China and Hong Kong combined, account for close to 40 percent of the total. The stabilization of China's economy and the improvement in the state of its manufacturing industry has evidently helped boost Taiwan's exports. Taiwan's fortunes are, to some extent, tied to the trends of the consumer electronics industry, and there is considerable talk about how to diversify the economy so that it become less vulnerable to the vicissitudes of the electronics market. The net export exceeds 10 percent of the yearly GDP since 2014, in 2020, these figures were 14 percent (10 percent in 2019) in Taiwan (Table 4) and 2.8 percent in 2019 in Hungary.

It is worth examining in more detail what happened in 2016. Taiwan's GDP growth reached 1.5 percent in 2016, increasing from 0.72 percent in the previous year due to the improving figures in private consumption, investment and exports. The economic recovery has had a positive effect on the retail sector. Retail sales registered a historical peak of 4.1 trillion TWD in 2016, increasing by 1.9 percent year-on-year (YoY), with the main contributors being supermarkets (9.3 percent YoY), auto sales (5.4 percent YoY), and convenience stores (4.7 percent YoY) (Savills World Research, 2017). Retail sales in Taiwan totaled 4.15 trillion TWD (143 billion USD) in 2017, up 1.2 percent from 2016 when the previous peak of 4.10 trillion TWD was reached, MOEA data showed. The retail sales added up to 3.8 trillion TWD in 2020 after the 3rd wave of the Covid-19 pandemic, the average index was +4.6 percent MoM (Month on Month). The sales in the first half of 2021 were higher than

one year before (in 2021/Q1 2.2 trillion TWD, based on data from the Ministry of Economic Affairs Department of Statistics of Taiwan) (MOEA, 2022).

4.1. Consumption

Although consumer spending value in Taiwan has been growing modestly, a trend that is likely to continue in the coming years, the portion of the households' consumption has stagnated for several years. Spending is being driven by rising employment, which is the result of improved exports. In addition, a strong equity market is boosting consumer wealth. Also, the Taiwanese labor market is relatively tight, and productivity has been rising, thus setting the stage for wage gains that could have a positive impact on consumer spending. On the other hand, wages in Taiwan have been remarkably resistant to improvement, unlike in the neighboring South Korea. Thus, it remains uncertain whether an improvement in the export environment will actually generate significant wage gains.

Figure 2: Average Expenditure and Savings of Households
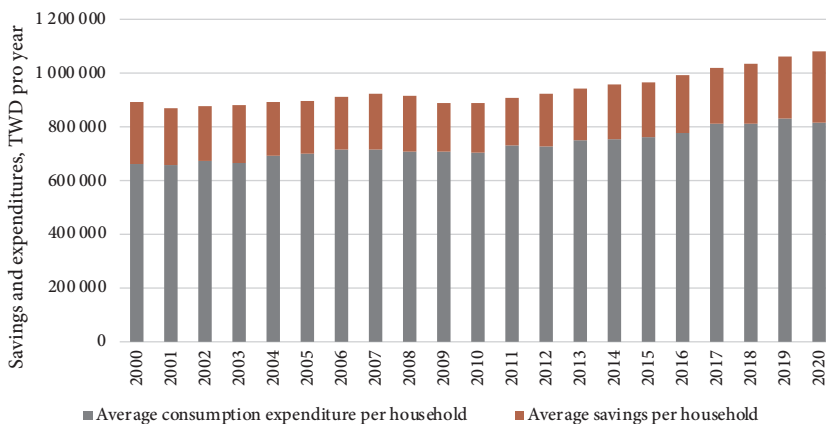
Source: MOEA, 2022.

In the past ten years, the share of consumption of household income fluctuated between 75-80 percent. It is assumed that the level of consumption depends directly on the level of disposable income (Appendix 2). The higher the disposable income, the greater the consumption, so the main question is how strong the relationship between consumption and disposable income is: this is called the consumption function.

The main research topics in this part are how households decide about spending income, how much of their income to consume, and how their income correlates with consumption. This is a typical microeconomic question, but the answer has macroeconomic consequences from the aspect of research. In this chapter, it will be seen how the Taiwanese households' consumption decisions have been influenced by incomes and how they affect the national GDP. It is depicted in Figure 3 that the marginal propensity to consume, which is the portion of spent money out of an additional dollar of income in terms of the statistical data (Appendix 3). The relevance of the country-specific marginal propensity to consume is the power and ability of fiscal policy to influence the economy and stems from the feedback between income and consumption.

Based on statistical data, the components of the consumption are shown in the next equation:

$$C = c_0 + \hat{c}Y$$

C is consumption, Y is disposable income, c_0 is a constant, and $\hat{c}$ is the marginal propensity to consume.

Figure 3: Linkage of income consumption (date in Billion TWD)
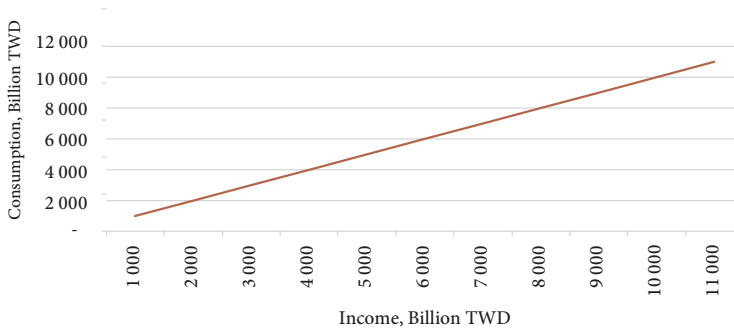
Source: authors' own compilation on the basis of MOEA data (MOEA, 2022).

The equation in numbers means, that $\hat{c} = 0.95$ and $c_0 = -719{,}030$. The autonomous yearly consumption—which is not driven directly by income—is represented by a negative figure, meaning a very strong correlation between income and consumption. One dollar of additional income results in 0.95 dollar plus consumption, which denotes the average propensity to consumption as well.

It is worth comparing this to the corresponding figures of other countries. For example, in Hungary, the values of the $C=c_0+\hat{c}Y$ regression equation are the following: c_0 = 69,064.00, and c_0 = 0.74. Value "a" indicates where the point of intersection of axis Y is, that is, how the theoretical value of consumption would develop if the income was 0. This value is similar to the term "autonomous consumption", which was previously marked by c_0. Value "b", that is, c_1 was examined when determining marginal propensity to consume. This signifies the rise of the regression line, that is, in the case of a one-unit change in income, the value of the consumption category increases by 0.74 (Kozák, 2015). One of the potential explanations could be the altered savings rate. The long-term saving rate, which is the linkage between the income and savings, are similar in the two countries, for example in the period 2003-2016, 13 percent and 11 percent in Taiwan and Hungary respectively.

4.2. Retail Spending within the Consumption

Knowing the consumption function, it is worth examining the sensitivity of the equilibrium of Supply and Demand in respect of the economy's output in Taiwan. The Gross Domestic Product (GDP) by Kind of Activity includes the retail figures (Appendix 4) to analyze the sector's share in the economy in terms of value-added performance. In Taiwan, as in other developed countries, the service sector dominates, 65 percent of the GDP (Figure 4) stems from services, out of which 27 percent comes from ICT Industry (ten years ago this figure was only 22 percent).

Figure 4: Gross Domestic Product by Share of Activity
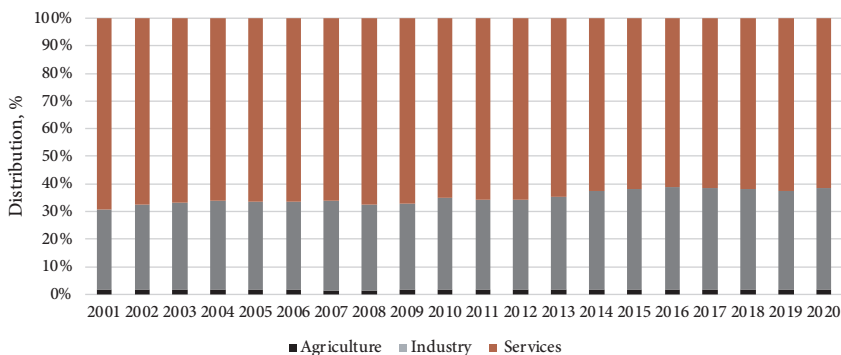
Source: authors' own compilation based on data from the National Statistics, Republic of China (Taiwan), 2021.

In Taiwan, the share of the wholesale and retail sector in recent years has been 15 percent of GDP, (in Hungary, the same figures are 10-11 percent), therefore, the examined sector plays a relatively important role in the economy. Within the 15 percent, retail represents a 6 percent value-added contribution to GDP. Despite the increasing role of the service sector, the retail value-added expenditures to GDP remained at the 16-17 percent belt in the past ten years. The main reason for this stagnating share of GDP is the growing competition in the sector.

In the next part, in terms of the presented figures, the sensitivity of the relationship between GDP and retail is calculated, it also is shown what happens if the disposable income is growing, resulting in additional consumption, which causes more spending in retail.

The following equations denote the linkage of the demand for goods and services in the analysis of equilibrium:

$Y=C+I+G$

As the consumption function relates consumption (C) to disposable income (total income deducted by tax and social contribution), it is analyzed how the total GDP expenditure changes when the consumption increases due to the rise in disposable income. In Table 4, the demand for the Taiwanese economy's output comes from the consumption, investment, and government purchases of the year 2016, while the basic figures come from the National Statistics (National Statistics Republic of China (Taiwan), 2021).

Table 4: The effect of the consumption function on aggregate output (data in Billion TWD)

Basic Version	Planned					
Output	Disposable	Consumption	Investment	Government		Aggregate
(Income)	Income	Domestic	Spending	Purchases	Net export	Expenditure
Y	Yd Y - T	C	I	G	I	C + I + G+I
17,152	10,067	9,032	3,570	2,466	2,085	17,152
18,867	11,074	9,856	3,570	2,466	2,085	17,977
20,754	12,181	11,633	3,570	2,466	2,085	19,753
22,829	13,400	12,796	3,570	2,466	2,085	20,917
25,112	14,740	14,076	3,570	2,466	2,085	22,196
27,624	16,214	14,764	3,570	2,466	2,085	22,885

Source: authors' own compilation on the basis of National Statistics, Republic of China (Taiwan), 2021.

In this model, the consumption depends on disposable income, and investment does not depend on the real interest rate; and also, government purchases and tax level are fixed. In addition, it is important to examine the sensitivity of the GDP expenditure to the supply of goods and services consumption. As 46 percent of consumption expenditure is spent in retail, it can be calculated how growing income results in increased retail sales. In Taiwan, 1 percent additional income generates 1.04 percent more retail sales.

It is assumed that the rising income affects consumption, which influences the level of production, and the production function determines the payable income for economical actors, —causing additional demand for the economy. In terms of the analysis, it could be stated, that a 1 million TWD increase in households' income causes 249,426 million TWD plus sales in retail, therefore—ceteris paribus—a GDP growth by 67,212 million TWD. This detailed relationship is called a multiplier effect as described in chapter 3.4.

4.3. The Multiplier Effect of Retail

In the previous model, the GDP was computed in the way of the expenditure approach to calculating the total spending of GDP. The other way is to add up the income—wages, rents, interest, and profits—received by all factors of production in producing final goods and services by different sectors (Case et al., 2012). These two methods must lead to the same value as every payment (expenditure) by a buyer is at the same time a receipt (income) for the seller. The income approach can be used to calculate the share of the retail sector in GDP and examine its relationships to other sectors. The Statistical Bureau of Taiwan compiles the benchmark IO tables produced according to the results of the Industry, Commerce, and Service Census Survey every 5 years. However, it regularly disseminates the Input-Output Tables (the matrices), which represent interrelationships between each industry. These tables include various kinds of transactions tables, input coefficient tables, and impact coefficient tables, which are described in this survey too.

4.3.1. Transaction Table

The Transactions Table is the basic table of Input-Output statistics. Each row represents the destination, for intermediate consumption or final use, of commodities, for example, sold by retail companies. Each column details the production

function of a specific commodity or service activities acted, for example, by retailers, including the value of the commodity's total output, the mix of commodities it consumes to produce this output, and the value-added by labor, and the capital producing this output. The final use columns detail the commodity composition of the final use components of GDP. Inputs are consumed by producing and by the service provider sectors—these are the intermediate inputs, such as raw materials or semi-finished inventories—and by final use. Value added is equal to the net income earned in production—this includes labor earnings, i.e., the resource to pay for income owners, which stems from the difference between total sales and input purchases, this means that the total gross output is equal to the sum of intermediate inputs, and value-added summed up across all industries is equal to regional GDP. Out of 21.0 trillion TWD of total intermediate demand, the retail sector represents 4.1 trillion TWD input goods and services purchases (Table 5).

Table 5: Retail in Transactions Table at Producers' Prices unit: million TWD

	Wholesale and Retail Trade	Intermediate Demand
Intermediate Inputs	1,223,492	21,035,327
Compensation	1,589,996	7,295,871
Operating Surplus	1,116,025	3,824,430
Consumption of Fixed Capital	154,450	2,409,901
Taxes on Production and Imports Less: Subsidies	54,052	404,269
Net Commodity Taxes	-	132,194
Net Import Duties	-	-
Value-Added Taxes	-	56,061
Other Taxes, Less Subsidies	54,052	216,014
Primary Inputs	2,914,523	13,934,471
Adjustment Item	-	6,885
Total Inputs	4,138,015	34,976,683

Source: authors' own compilation on the basis of National Statistics, Republic of China (Taiwan), 2021.

Value-added is defined as the value of gross output minus intermediate inputs excluding any income accumulations among companies. The added value is the source of the payments made for economic actors, namely for example, the rewarding of employees in the form of wages or salaries, and the taxes on production and imports. Therefore, the transaction table shows the economic actors' contributions to the national gross domestic product through household consumption, (local) government expenditures, net export figures, company investments, capital expenditures, and import value (Moss, 2007). In the statistical data, wholesale figures are integrated into retail figures. Nevertheless, on the national level model, the value chain accumulation is avoided.

Noteworthy is the high portion of the primary input out of the total input, which signs relevant value-added sharing in retail (70 percent), this is the source of income payment for business actors, such as employees. The compensation level represents 30 percent in Taiwan. In Hungary, the share of value-added disbursement in retail is 65 percent (Central Statistical Office of Hungary, 2022), while the employees' compensation is on the Taiwanese level, and the taxes dominate more in Hungarian commerce, the VAT in Taiwan 5 percent, as in Hungary the main tax key is 27 percent.

On the national level, the gross output is equal to the sum of the intermediate inputs and value-added, which can be measured as the sum of the intermediate inputs and final use. As the total demand equals the total supply—considering the operational surplus—the retail sector performance is the same as the input buying in the input-output model. In this survey, the benchmark input-output tables are compiled for the year 2016.

4.3.2. Impact Effects Coefficients

Input coefficients are obtained by dividing input with output in terms of the Input Coefficients Table of Domestic Goods and Services (D) (National Statistics, Republic of China (Taiwan), 2022). The input coefficient in the case of retail and wholesale sectors denotes the input required under existing selling technologies. It represents a certain production technological standard and is called technology coefficient, thus the input goods purchasing represents 25 percent of the total expenditures in the retail sector.

The Impact coefficients are also known as the Inverse Matrix Coefficients, or Interdependence Coefficients, or Impact Effects Coefficients. "Coefficient" means the number of units that have to be bought, either directly or indirectly, from various sectors for every additional unit needed for a given sectoral output. What is eventually needed to influence the output, either directly or indirectly, added value and input through industry linkage is called "Feedback Effects of the Final Demand". The retail multiplier effect is used for evaluation, which calculates the domestic inverse matrix results of the feedback effects on the final demand (National Statistics Republic of China (Taiwan), 2022.). The Impact coefficients are also named Inverse Matrix Coefficients, Interdependence Coefficients, or Impact Effects Coefficients. In the case of retail this means the numbers of units or values that are received, directly or indirectly, from each industry to deliver one unit of the retail sector to final users, and also expresses the degree of interdependence

between different industries. The value of the coefficients of wholesale and retail trade is 1.032370, so for example, 1 million TWD additional trade purchases increase the total intermediate input generation by close to 3 percent. In other words, any 1 million TWD local additional buying goods and services by retailers lead to a plus 376,000 TWD direct effect in Taiwan spent by those companies who produce the inputs for retailers.

5. Sustainability in Taiwanese Commerce

The climate change is a growing problem in every aspect of life. Commercial activities contribute to the tremendous damage to the environment.

The retail sector accounts for around 24.5 percent of all jobs in Europe. However, it is also responsible for 2-3.5 percent of the total CO_2 emissions (European Commission, 2012). The transfer of goods causes huge environmental pollution. Additionally, the activities of commerce are responsible for a lot of waste. The pandemic resulted in a huge expansion of online sales activities that consequently multiplied the quantity of used packaging and increased transfer needs, causing growing environmental damage.

The commercial sector generates 10-15 percent of the local waste. The long value chains increase the effect of environmental damage as well.

The countries try to manage the problem of pollution with regulations, for instance, with the restriction on plastic packaging. In addition to this, it will be more and more important to call the commercial firms' attention to change their business policy and inform them, how they can contribute to the solution of environmental problems.

Taiwan's objective is to grow and farm most of the food the population consumes, instead of importing it. These activities serve the aims of sufficiency and sustainability, and additionally, help to decrease the environmental damage caused by transportation of imports. A further aim is to reduce food waste with the help of "circular economy", which is a method that can manage the food system in an effective way. The Environmental Protection Administration (EPA) is currently working on this concept, dealing with the creation of a regenerative and restorative economy.

Since Taiwan has to import most of its fossil fuels, they are trying to find alternative ways to cover energy needs. One suggestion is to set up new bioenergy plants, where they could utilize food waste as well.

It will be increasingly important to find methods which can encourage the recycling of waste because the landfills will run out soon. Recycled and recyclable packaging and other products become more and more important in commercial circulation, although Taiwan is a leader in the development of recycling.
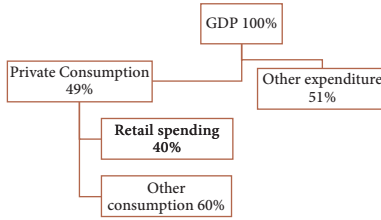
The government is supporting the development of the green economy by acting on the four pillars of green growth: legislation and regulation, market incentives, innovation, and networking (European Chamber of Commerce, Taiwan, 2018).

6. Conclusion

The Asia-Pacific region continues to be heralded as a region of opportunity and growth. Moreover, across the majority of markets, local economies fared well before the pandemic. Generally, consumers across the region appeared more confident in the last years, buoyed predominantly by increasing optimism in job prospects and the state of their personal finances. But while the economic environment might seem favorable, the majority of consumers across almost all markets are trying to curb their spending habits to save on expenses. The pandemic enhanced this process. Saving on groceries is also a top priority for one in five consumers in the Asia-Pacific. This feeling remains, as savings continue to be a top priority for people after they have covered their essential living expenses. The Fast-Moving Consumer Goods (FMCG) industry is feeling the effect of this cautiousness, with offline growth being a mixed bag across the region. While e-commerce is often touted as a major disruptor, stealing consumers' dollars from brick-and-mortar stores, the story in the Asia-Pacific isn't that simple. E-commerce affects and will continue to affect our retail landscape, but it's not an immediate game-changer for all markets. Conditions need to be right for e-commerce to thrive. Variables will differ by market, and no single market will achieve a perfect score across all measures. Therefore, it's critical to have the right foundations and market dynamics at play for e-commerce to grow and prosper. A number of these variables are cultural, systematic, and infrastructural changes need to occur. This means that offline retail will not disappear soon. Consequently, while e-commerce is a "must-have" for horizon planning in the short, medium and long term, it's important not to get too caught up in the hype and buzz of the press and

lose focus on where the majority of your business rests today. Remembering this varies by market and category.

Figure 5: The role of retail spending in Taiwan

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                              ┌──────────────┐
                              │  GDP 100%    │
                              └──────┬───────┘
              ┌──────────────────────┴─────────────┐
   ┌──────────────────────┐              ┌──────────────────────┐
   │ Private Consumption   │              │  Other expenditure    │
   │        49%            │              │        51%            │
   └──────┬───────────────┘              └──────────────────────┘
          │        ┌──────────────────────┐
          ├────────│   Retail spending     │
          │        │        40%            │
          │        └──────────────────────┘
          │        ┌──────────────────────┐
          └────────│     Other             │
                   │  consumption 60%      │
                   └──────────────────────┘
```

Source: authors' own compilation on the basis of National Statistics, Republic of China (Taiwan), 2021.

The share of private consumption in Taiwan exceeds 49 percent (Figure 5), and in Hungary, the same figure is the same, 49 percent, so in both countries, consumption is one of the main drivers of growth. From the sectors' activities point of view, it can be seen that the commerce (including retail and wholes) added value contributes to GDP by 15 percent, in Hungary the same is 10 percent, so this difference is significant between the two countries. On one side, the explanation could be the higher standard of living, which is reflected in GDP per capita, Taiwanese data is 1.5 times higher than the Hungarian figure. On the other side, more services allow higher margins at the company level, so the added value can be higher for Taiwanese entrepreneurs. The Retail Sale in General Merchandise Stores represents 34 percent of total selling, and an increasing portion if online sales, so the strengthening omnichannel model helps to achieve higher profitability for Taiwanese retailers.

References

Acemoglu, D. – Laibson, D. – List, J. (2016): Macroeconomics. Global Edition. London: Pearson.

MOEA (Department of Statistics, Ministry of Economic Affairs) (2022) [online] available at: https://dmz26.moea.gov.tw/GMWeb/investigate/InvestigateEA.aspx?lang=E

Benassy-Quere, A. – Coeure, B. – Jacquet, P. – Pisani-Ferry, J. (2018): Economic Policy: Theory and Practice. Oxford: Oxford University Press.

Case, K. E. – Fair, R. C. – Oster, S. M. (2012): Principles of Economics. Boston: Prentice Hall.

Central Intelligence Agency (2018): The World Fact Book - Taiwan. [online] available at: https://www.cia.gov/the-world-factbook/countries/taiwan/

Central Statistical Office of Hungary (2022): [online] available at: https://www.ksh.hu/stadat?lang=hu&theme=gdp

Deutsche Bank Market Research (2017): APAC Retail and Property. December 13, 2017. [online] available at: http://pg.jrj.com.cn/acc/Res/CN_RES/INVEST/2017/12/13/f77cb292-5527-4f0f-9173-c9c594a367ca.pdf

European Chamber of Commerce, Taiwan (2018): Circular economy development in Taiwan. October 16, 2018. [online] available at: https://www.ecct.com.tw/circular-economy-development-in-taiwan/

European Commission (2012): Compromise for a reduction of the environmental impact of the retail sector. [online] available at: https://webgate.ec.europa.eu/life/publicWebsite/index.cfm?fuseaction=search.dspPage&n_proj_id=3486#results

GfK (2018): European Retail in 2018. April 2018. [online] available at: http://www.gfk-geomarketing.de/fileadmin/gfkgeomarketing/en/EN_European_Retail_Study_2018.pdf

JP Morgan (2021): E-commerce Payments Trends: Japan. [online] available at: https://www.jpmorgan.com/merchant-services/insights/reports/japan

Kozák, T. (2015): The Role of Consumption in the Hungarian Economy. Determining Marginal Propensity to Consume and the Multiplier Effect on the Basis of Domestic Statistical Data. In: Karlovitz J. T. (Ed.) Some Current Issues in Economics. pp. 65-73.

Leontief, W. (1986): Input-Output Economics. New York: Oxford University Press.

Mankiw, N. G. (2003): Macroeconomics. New York: Worth Publishers.

Moss, D. A. (2007): A Concise Guide to Macroeconomics: What Managers, Executives, and Students Need to Know. Boston: Harvard Business School Press.

National Statistics, Republic of China (Taiwan) (2021) [online] available at: https://eng.stat.gov.tw/ct.asp?xItem=37408&CtNode=5347&mp=5

National Statistics, Republic of China (Taiwan) (2022): I/O Tables. [online] available at: https://eng.stat.gov.tw/np.asp?ctNode=1555

National Statistics, Republic of China (Taiwan) (2022): 2011 - 52 Sectors. [online] available at: https://eng.stat.gov.tw/ct.asp?xItem=36703&ctNode=1650

O'Connor, R. – Henry, E. W. (1975): Input-Output Analysis and Its Applications. London: Charles Griffin and Co. Ltd.

Reuters (2021): Taiwan applies to join Pacific trade pact week after China. September 22, 2021. [online] available at: https://www.reuters.com/world/asia-pacific/taiwan-applies-join-pacific-trade-pact-cptpp-official-news-agency-2021-09-22/

Savills World Research (2017): Asian Cities Report Taiwan Retail 1H2017. [online] available at: https://pdf.savills.asia/asia-pacific-research/taiwan-research/taiwan-retail/asian-cities-tw-retail-1h-2017.pdf

Wilson, M. (2021): China is first country to have e-commerce make up more than half of total retail sales. February 17, 2021. [online] available at: https://chainstoreage.com/china-first-country-have-e-commerce-make-more-half-total-retail-sales

World Economic Forum (2018): The Global Competitiveness Report, 2017-2018. [online] available at: https://www3.weforum.org/docs/GCR2017-2018/05FullReport/TheGlobalCompetitivenessReport2017%E2%80%932018.pdf

Appendix 1: Key macroeconomic indicators of selected economies in Asia, 2016

	Population (million)		GDP (USD billion; at market exchange rate)		GDP per head (USD; at market exchange rate)		Consumer price inflation (avg; %)	
	2016	2020	2016	20191	2016	20202	2016	20203
China	1,366.0	1.398.0	11,357.0	14,723.0	8,313	10,500	2.1	2.4
Japan	126.3	125.8	4,941.0	5,065.0	39,110	40,113	-0.1	0.0
South Korea	50.5	51.7	1,402.5	1,647.0	27,770	31,489	1.0	0.5
Taiwan	23.6	23.5	529.3	612.2	22,487	32,747	1.4	-0.2
Singapore	5.6	5.7	297.0	374.4	52,961	59,798	-0.5	-0.2
Malaysia	30.8	31.9	295.1	364.7	9,598	10,402	2.1	-1.1
Thailand	68.1	69.6	405.2	544.3	5,946	7,189	0.2	-0.8

Source: Euromonitor International; compiled by Fung Business Intelligence (data from 2016); Worldbank. 2019-2020.

1 Based on data of Worldbank, 2019.
2 Based on data of Worldbank, 2020.
3 Based on data of Worldbank, 2020.

Appendix 2: Taiwanese expenditures on Gross Domestic Product at Current Prices (Unit: Million TWD)

Period	GDP	Domestic Demand				Demand of Rest of The World
		Private Final Consumption	Government Final Consumption	Gross Fixed Capital Formation	Changes in Inventories	Net Export Subtotal
2006	12,640,803	6,947,802	1,854,009	3,063,352	47,643	727,997
2007	13,407,062	7,197,916	1,922,075	3,205,121	16,361	1,065,589
2008	13,150,950	7,260,169	1,991,181	3,045,433	171,594	682,573
2009	12,961,656	7,175,511	2,055,721	2,761,737	-181,488	1,150,175
2010	14,119,213	7,497,682	2,098,717	3,335,881	188,764	998,169
2011	14,312,200	7,798,976	2,167,595	3,346,945	35,921	962,763
2012	14,686,917	8,035,105	2,254,282	3,282,131	22,029	1,093,370
2013	15,230,739	8,248,385	2,242,637	3,378,731	-18,535	1,379,521
2014	16,111,867	8,588,741	2,342,754	3,493,834	27,323	1,659,215
2015	16,770,671	8,755,829	2,346,110	3,493,267	19,845	2,155,620
2016	17,152,093	9,031,513	2,465,870	3,584,910	-15,206	2,085,006
2017	17,444,666	9,246,526	2,456,036	3,580,972	-46,213	2,207,345
2018	18,375,022	9,610,482	2,623,385	4,001,128	84,773	2,055,254
2019	18,932,525	9,885,165	2,656,205	4,490,003	-26,325	1,927,477
2020	19,766,240	9,608,671	2,770,148	4,682,607	5,782	2,699,032

Source: National Statistics, Republic of China (Taiwan), 2021.

Appendix 3: National Disposable Income, Consumption and Savings, at current prices, (Unit: Million TWD)

Year	National Disposable Income Households	National Consumption Households	Net National Savings Households
2006	8,087,876	6,947,802	1,140,074
2007	8,469,505	7,197,916	1,271,589
2008	8,560,131	7,260,169	1,299,962
2009	8,176,998	7,175,511	1,001,487
2010	8,583,814	7,497,682	1,086,132
2011	8,769,454	7,798,976	970,478
2012	9,104,584	8,035,105	1,069,479
2013	9,174,381	8,248,385	925,996
2014	9,884,804	8,588,741	1,296,063
2015	10,084,659	8,755,829	1,328,830
2016	10,067,332	9,031,513	1,035,819
2017	10,719,915	9,325,676	1,394,239
2018	11,328,750	9,610,482	1,718,268
2019	11,508,541	9,885,165	1,623,376

Source: National Statistics, Republic of China (Taiwan), 2021.