

## Macroeconomic Variables and Visitor Arrivals in Taiwan: The Cases of Tourism and Business

Matthew C. Chang\*

Ching-Sung Wu

### Abstract

In this case, students are supposed to examine the relationships among macroeconomic variables and number of visitor arrivals in Taiwan for business and tourism purposes from China, Hong Kong and Macau, and Japan. Students should find different relationships among numbers of visitor arrivals for the two purposes. Also, number of visitor arrivals for tourism purpose and that for business purpose influenced by macroeconomic variables should also be examined. In particular, the potential crowd-out effects of numbers of visitor arrivals from different countries, and influences of macroeconomic variables on numbers of visitor arrivals should be re-examined.

**Keywords:** Visitor Arrivals, Macroeconomic Variables, Crowd-out Effects, Tourism Policy

### I. Background

Tourism industry is one of the leaders in service industries for Taiwan's economic development in the 21<sup>st</sup> century. Influenced by global recession and the financial tsunami, number of tourists to visit most Asian countries declined. However, in recent years, Taiwan's tourists are growing because of creative tourism marketing, resulting in 4.395 million international passengers to visit Taiwan, an annualized growth rate of 14.3 percent. Furthermore, the number of tourists to Taiwan in November 2010 has exceeded 500 million, and the number of tourists to Taiwan reached 5.567 million in 2010, an annualized growth rate of 20 percent. According to the estimates of the World Travel and Tourism Council (WTTC), the number of tourists will be more than 1.6 billion around the world, and the global tourism revenue will reach more than two trillion USD in 2020.

On the other hand, in addition to substantial growth of sightseeing tourists, tourists for other purposes (*e.g.*, business, education, *et al.*) to Taiwan are growing slowly. In particular, although the number of tourists to Taiwan for medical treatment has grown from 58,444 in 2012 to 100,083 in 2013, it was 60,951 in 2014, only 60% of the number in 2013. Thus, such results demonstrate a big warning to the government as its policies to promote medical tourism. In this case, you will investigate the relationship between number of tourists and macroeconomic variables. In particular, you will analyze such relationships for tourists of different purposes to visit Taiwan. You are expected to contribute on decision making for the government, as well as firms in tourism industry.

Many studies focus on the relationship between macroeconomic indicators and tourism industry. For example, Richards (1999), Agarwal and Yochum (1999), Baaijens and Nijkamp (2000), Victurine (2000), Goldstein (2001), Strizzi and Meis (2001) and Crompton et al. (2001) indicate the influence of Gross Domestic Product (GDP) on tourism industry. Lindberg and Aylward (1999), Papatheodorou (1999), Kashyap and Bojanic (2000) and Goodrich (2001) point out the significant relationship between Consumer Price Index (CPI) and tourism industry. Shachmurove (1999), Matteo (1999) and Coshall (2000) analyze the impact of exchange rates on international leisure travelers. Furthermore, Toh et al. (2001) examine the relationship among income, prices

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and tourism industry; Webber (2001) investigate the impacts of prices and exchange rates on tourism industry, while Lim and McAleer (2001) discuss the relationships of income, prices, exchange rates, and tourism industry.

Moreover, Eilat and Liraneinav (2004) distinguish the samples into developed and developing countries by GDP, and explore the differences of macroeconomic variables in explaining the number of tourists. They conclude that, prices are more responsible for the explanation of number of tourists arrived in developed countries. However, destination risk, bordering, common language and distance explain similarly in number of tourists both for the developed and developing countries. Interestingly, Culiuc (2014) indicates that the impact of GDP on tourism is lower than general trade, while the exchange rate of destination country has great influence on the number of tourists. Moreover, tourists visit Organization for Economic Cooperation and Development (OECD) countries are more affected by GDP and real exchange rates, because these countries have more business travelers. On the contrary, tourists visiting island countries are less affected by real exchange rates, and direct flight and other factors have more influence on the number of tourists. Yang et al. (2014) investigate China's domestic tourists, and find that absolute income, relative income, prices in destinations and alternatives prices have significant impacts on the number of domestic tourists in China.

## II. Data

This case study provides sample data from the first quarter, 2009 to the fourth quarter, 2014, a total of 24 quarters (96 months), which includes the periods that the Taiwanese government started to release the restrictions on tourists from China. The case obtained data of visitor arrivals from China, Hong Kong and Macau, and Japan for different purposes (*i.e.*, business and tourism) from the official website of Tourism Bureau, Ministry of Transportation and Communication, Taiwan. Furthermore, the study obtained macroeconomic data (*i.e.*, GDP, CPI, and exchange rate) from Taiwan Economic Journal (TEJ) database.

Table 1 presents the statistics of visitor arrivals from China, Hong Kong and Macau, and Japan for business and tourism purposes and Table 2 presents macroeconomic variables of Taiwan, China, Hong Kong and Macau, and Japan.

## III. Questions and Discussion

1. Use the standard econometric analysis (e.g., ADF) to discuss whether those time series are stationary
2. Discuss the potential crowd-in or crowd-out effects of the visitor arrivals to Taiwan from China, Hong Kong and Macao, and Japan for the purposes of business and tourism, respectively.

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**Author**

**Matthew C. Chang\***

Associate Professor, Department of International Business Administration, College of Commerce, Chinese Culture University, Taiwan, [a04979@gmail.com](mailto:a04979@gmail.com)

**Ching-Sung Wu**

Professor and Dean, College of Commerce, Chinese Culture University, Taipei, Taiwan

\*corresponding author

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## Appendix

Table 1: Number of Visitor Arrivals for Business from China, Hong Kong and Macau, and Japan

Month	Business			Tourism		
	Hong Kong and Macao	China	Japan	Hong Kong and Macao	China	Japan
Jan-09	4,121	2,908	16,188	34,363	19,420	44,090
Feb-09	5,083	4,347	19,601	27,410	16,249	69,950
Mar-09	5,732	5,402	20,245	41,861	45,739	73,682
Apr-09	4,736	5,748	18,149	71,735	79,272	52,313
May-09	4,878	5,750	13,661	48,681	64,458	48,275
Jun-09	6,275	6,739	19,453	46,454	26,135	35,485
Jul-09	5,539	5,297	18,989	51,308	37,890	44,630
Aug-09	5,468	6,208	17,891	56,475	43,614	51,866
Sep-09	5,754	5,218	19,609	28,902	31,620	70,013
Oct-09	5,560	6,088	19,916	39,387	42,840	58,647
Nov-09	5,940	8,531	21,804	34,985	74,296	54,025
Dec-09	4,872	7,461	19,954	56,913	57,573	59,668
Jan-10	5,860	6,188	20,519	24,808	59,348	56,587
Feb-10	4,244	3,577	18,034	40,403	80,041	46,438
Mar-10	6,957	7,166	24,251	43,131	115,379	76,518
Apr-10	5,575	7,615	22,301	54,426	149,261	48,300
May-10	6,096	9,223	21,991	49,224	143,153	55,305
Jun-10	6,145	7,703	24,099	58,723	103,667	50,558
Jul-10	5,482	7,154	22,717	54,858	92,991	46,249
Aug-10	6,073	7,528	22,712	61,202	82,194	57,450
Sep-10	5,782	7,197	23,522	37,022	70,916	58,608
Oct-10	5,564	8,363	21,728	39,123	114,312	60,672
Nov-10	6,213	8,445	22,596	37,958	130,748	73,477
Dec-10	5,023	9,385	20,842	59,204	86,076	71,399
Jan-11	5,936	6,554	23,831	25,901	69,384	68,640
Feb-11	4,722	6,052	23,174	39,948	85,178	74,385
Mar-11	6,908	9,531	24,442	37,678	122,200	80,112
Apr-11	5,699	11,005	24,029	62,408	158,742	55,444
May-11	6,467	12,990	24,481	37,388	113,292	57,500
Jun-11	6,527	12,270	27,038	53,501	76,397	57,731
Jul-11	5,576	10,388	25,102	50,764	90,483	61,458
Aug-11	6,043	9,643	23,644	56,468	95,529	84,212
Sep-11	5,462	11,162	25,324	33,825	73,622	90,172
Oct-11	5,878	11,379	26,166	40,801	115,625	79,515
Nov-11	6,382	12,895	26,824	43,150	158,150	96,275
Dec-11	5,105	11,612	23,890	71,925	132,331	97,289
Jan-12	4,462	2,977	21,166	45,536	106,087	63,910
Feb-12	6,284	3,828	25,888	33,894	124,408	100,605
Mar-12	6,886	4,585	26,908	59,079	211,910	116,735
Apr-12	5,426	4,297	25,013	82,666	234,285	77,928
May-12	6,539	4,288	25,403	53,124	181,876	84,745
Jun-12	6,361	4,631	27,899	82,104	152,637	74,254

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Table 1: Number of Visitor Arrivals for Business from China, Hong Kong and Macau, and Japan (Continued)

Month	Business			Tourism		
	Hong Kong and Macao	China	Japan	Hong Kong and Macao	China	Japan
Jul-12	5,441	4,276	26,990	69,631	183,406	67,351
Aug-12	5,400	3,572	23,179	75,116	159,547	97,208
Sep-12	4,146	4,235	24,820	35,784	132,162	89,009
Oct-12	3,174	4,056	26,490	12,614	170,525	84,986
Nov-12	3,197	4,517	26,177	12,820	188,565	92,603
Dec-12	4,115	3,923	24,403	50,458	174,349	87,733
Jan-13	7,221	6,886	26,016	42,403	150,802	75,819
Feb-13	4,191	2,395	20,796	65,592	169,533	73,958
Mar-13	7,194	4,111	28,448	99,368	223,627	112,766
Apr-13	6,696	3,679	25,970	71,507	247,282	69,698
May-13	6,879	3,927	25,674	84,043	165,815	72,135
Jun-13	6,966	4,730	27,818	109,404	168,113	57,981
Jul-13	6,807	3,555	26,762	93,755	193,843	66,519
Aug-13	6,110	3,113	23,125	107,895	188,604	95,108
Sep-13	6,551	4,187	26,895	68,132	207,461	87,243
Oct-13	7,173	3,308	27,755	76,692	172,989	94,157
Nov-13	6,998	3,382	26,613	81,852	185,391	104,724
Dec-13	6,058	3,287	25,704	109,219	190,175	109,005
Jan-14	6,046	2,405	19,800	61,060	225,084	80,699
Feb-14	5,758	1,823	20,666	73,303	255,513	100,572
Mar-14	7,841	2,114	25,060	83,928	316,997	124,952
Apr-14	6,648	1,556	22,776	130,512	328,684	78,110
May-14	6,670	1,709	21,233	102,366	286,299	92,938
Jun-14	7,418	1,838	26,023	116,928	269,988	81,412
Jul-14	5,953	1,576	23,695	109,147	291,149	83,093
Aug-14	6,564	1,508	19,794	128,924	262,569	112,328
Sep-14	7,071	1,330	23,914	84,502	277,623	103,805
Oct-14	7,476	1,562	23,610	79,007	294,060	106,320
Nov-14	7,533	1,714	23,863	85,233	286,031	115,523
Dec-14	6,456	1,335	22,297	119,657	296,349	115,588

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Table 2: Macroeconomic Variables of China, Hong Kong and Macau, and Japan

Quarter	GDP			CPI			Exchange Rate		
	Hong Kong	China	Japan	Hong Kong	China	Japan	Hong Kong	China	Japan
Q1-09	389,033	69,755	467,974	98.40	242.37	101.10	7.75	6.83	98.39
Q2-09	396,706	78,326	473,120	98.10	239.64	100.80	7.75	6.83	95.55
Q3-09	421,283	83,059	469,520	97.20	242.40	100.80	7.75	6.83	89.77
Q4-09	452,223	109,368	473,722	100.00	246.04	100.00	7.75	6.83	92.06
Q1-10	422,783	81,622	479,502	100.50	248.18	100.30	7.76	6.83	93.21
Q2-10	412,768	91,218	482,702	101.00	246.59	100.10	7.78	6.78	88.58
Q3-10	456,830	95,820	486,545	99.00	251.13	99.90	7.76	6.69	83.23
Q4-10	483,951	129,323	481,179	102.90	257.36	99.60	7.78	6.59	81.44
Q1-11	463,467	96,311	471,255	104.90	261.59	99.80	7.79	6.55	82.75
Q2-11	456,607	108,148	464,913	106.70	262.37	99.70	7.78	6.46	80.40
Q3-11	495,500	116,233	474,813	104.70	266.45	99.90	7.79	6.40	76.65
Q4-11	518,856	150,872	475,266	108.80	267.91	99.40	7.77	6.32	77.58
Q1-12	483,654	107,995	480,800	110.00	271.00	100.30	7.76	6.30	82.15
Q2-12	473,958	119,103	476,027	110.60	268.14	99.60	7.76	6.36	79.57
Q3-12	523,740	126,382	472,226	108.70	271.51	99.60	7.75	6.29	77.50
Q4-12	555,707	165,842	472,199	112.90	274.61	99.30	7.75	6.23	86.20
Q1-13	507,518	118,855	477,686	114.00	276.69	99.40	7.76	6.21	94.08
Q2-13	490,962	129,154	480,192	115.20	275.38	99.80	7.76	6.19	99.05
Q3-13	548,852	138,753	481,676	113.70	280.47	100.60	7.75	6.12	97.87
Q4-13	584,472	182,083	481,299	117.70	281.47	100.90	7.75	6.06	105.38
Q1-14	532,711	128,213	487,863	118.50	283.33	101.00	7.76	6.22	103.18
Q2-14	521,577	140,831	489,272	119.30	281.71	103.40	7.75	6.20	101.34
Q3-14	579,893	150,864	484,878	121.20	284.96	103.90	7.77	6.14	109.40
Q4-14	611,566	216,555	489,516	123.40	285.70	103.30	7.75	6.00	120.20