

Case Number: NCCT109008

# **Telecommunications Market Survey**

Report Commissioned by:

National Communications Commission

Taiwan Institute of Economic Research

February 2021



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# **I. Purpose**

The rapid development in information and communications technologies has driven the overall digital economy to flourish. With the trend toward convergence, the communications industry is vital to the national economy and development. In particular, how consumers use communications services in the communications market is not only closely related to business operations and technological development in the overall communications industry, but its impact is also expanding to numerous other industries.

A survey on the communications provides an overview of the national development and consumer behavior. A mechanism of surveys and investigations on the market and consumer behavior has been established for a long time in many developed countries worldwide, such as Ofcom, the communications regulator in the UK, the Ministry of Internal Affairs and Communications in Japan, KCC in Korea and IMDA in Singapore. In these countries, related information is regularly collected and documented to provide important statistics about the communications industry. A regular survey can serve as a key indicator of overall national development on one hand and offer an understanding of the consumer behavior and the market on the other.

The National Communications Commission (NCC) of Taiwan conducted its first comprehensive communications market survey in 2017. The survey aims to obtain first-hand objective and detailed data on consumer behavior and the status of innovative applications through a comprehensive and in-depth investigation of the demand side. In addition, the obtained information obtained will serve as an indicator of the development of Taiwan's digital economy, as well as the basis for the development of future policies and regulations.

## **II. Survey Methods**

### **A. Questionnaire Design**

The questionnaires used in this survey are designed with reference to the way Ofcom, the British communications regulator, has surveyed consumer behavior and trends in the communications market, and are modified based on the latest development of Taiwan's convergence.

## B. Population and Sampling Strategy

### 1. Survey population

The survey was conducted in Taiwan proper, Penghu, Kinmen and Matsu, with people aged 16 and over (those who were born on and before December 31, 2004) being approached.

### 2. Sampling method

Using the principle of PPS (probabilities proportional to size) sampling, sampling was performed in three stages. In the first and second stages, samples were allocated based on the proportion of the population in the area; while in the third stage, samples were selected using convenience sampling.

The stratified sampling used in this research is based on the classifications established by Peichun Hou et al. (2008), where villages, towns, cities and districts are grouped into seven levels based on the development. Thus, Taiwan's 358 townships and districts are divided into seven levels. They are city cores, commercial and industrial areas, emerging cities and townships, traditional industry townships, less-developed townships, established townships and remote townships. The primary sampling units were townships, the secondary sampling units were villages, and the third sampling units were gathering places in the townships where an interview point was set up.

**Table 1 Levels of Townships and Districts**

| Level Code | Names of Districts and Townships                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1          | Songshan District of Taipei City, Xinyi District of Taipei City, Da'an District of Taipei City, Zhongzheng District of Taipei City, Datong District of Taipei City, Wanhua District of Taipei City, Yonghe District of New Taipei City, Central District of Taichung City, West District of Taichung City, North District of Taichung City, East District of Tainan City, West Central District of Tainan City, Yancheng District of Kaohsiung City, Sanmin District of Kaohsiung City, Xinxing District of Kaohsiung City, Qianjin District of Kaohsiung City, Lingya District of Kaohsiung City                                                                                                                                                                                                                                                                                                                    |
| 2          | Zhongshan District of Taipei City, Wenshan District of Taipei City, Nangang District of Taipei City, Neihu District of Taipei City, Shilin District of Taipei City, Beitou District of Taipei City, Banqiao District of New Taipei City, Sanchong District of New Taipei City, Zhonghe District of New Taipei City, Xinzhuang District of New Taipei City, Tamsui District of New Taipei City, Luzhou District of New Taipei City, Linkou District of New Taipei City, Taoyuan City of Taoyuan County, Zhongli City of Taoyuan County, Zhubei City of Hsinchu County, East District of Hsinchu City, North District of Hsinchu City, South District of Taichung City, Xitun District of Taichung City, Nantun District of Taichung City, Beitun District of Taichung City, North District of Tainan City, Gushan District of Kaohsiung City, Zuoying District of Kaohsiung City, Fengshan District of Kaohsiung City |

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3 | Xindian District of New Taipei City, Shulin District of New Taipei City, Yingge District of New Taipei City, Sanxia District of New Taipei City, Xizhi District of New Taipei City, Tucheng District of New Taipei City, Taishan District of New Taipei City, Yangmei City of Taoyuan County, Luzhu Township of Taoyuan County, Dayuan Township of Taoyuan County, Guishan Township of Taoyuan County, Bade City of Taoyuan County, Longtan Township of Taoyuan County, Pingzhen City of Taoyuan County, Zhudong Township of Hsinchu County, Hukou Township of Hsinchu County, Xinfeng Township of Hsinchu County, Qionglin Township of Hsinchu County, Baoshan Township of Hsinchu County, Xiangshan District of Hsinchu City, Zhunan Township of Miaoli County, Toufen Township of Miaoli County, Fengyuan District of Taichung City, Shalu District of Taichung City, Wuqi District of Taichung City, Tanzi District of Taichung City, Daya District of Taichung City, Wuri District of Taichung City, Longjing District of Taichung City, Taiping District of Taichung City, Dali District of Taichung City, Shanhua District of Tainan City, Rende District of Tainan City, Guiren District of Tainan City, Yongkang District of Tainan City, Annan District of Tainan City, Anping District of Tainan City, Nanzi District of Kaohsiung City, Xiaogang District of Kaohsiung City, Daliao District of Kaohsiung City, Dashe District of Kaohsiung City, Renwu District of Kaohsiung City, Niasong District of Kaohsiung City, Gangshan District of Kaohsiung City |
| 4 | Zhongzheng District of Keelung City, Qidu District of Keelung City, Nuannuan District of Keelung City, Renai District of Keelung City, Zhongshan District of Keelung City, Anle District of Keelung City, Xinyi District of Keelung City, Wugu District of New Taipei City, Shenkeng District of New Taipei City, Bali District of New Taipei City, Miaoli City of Miaoli County, East District of Taichung City, Changhua City of Changhua County, Yuanlin Township of Changhua County, Douliu City of Yunlin County, East District of Chiayi City, West District of Chiayi City, Xinying District of Tainan City, South District of Tainan City, Qianzhen District of Kaohsiung City, Qijin District of Kaohsiung City, Pingtung City of Pingtung County, Yilan City of Yilan County, Luodong Township of Yilan County, Hualien City of Hualien County, Ji'an Township of Hualien County                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 5 | Ruifang District of New Taipei City, Sanzhi District of New Taipei City, Shimen District of New Taipei City, Jinshan District of New Taipei City, Wanli District of New Taipei City, Daxi Township of Taoyuan County, Xinwu Township of Taoyuan County, Guanyin Township of Taoyuan County, Xinpu Township of Hsinchu County, Guanxi Township of Hsinchu County, Hengshan Township of Hsinchu County, Beipu Township of Hsinchu County, Yuanli Township of Miaoli County, Tongxiao Township of Miaoli County, Houlong Township of Miaoli County, Gongguan Township of Miaoli County, Tongluo Township of Miaoli County, Touwu Township of Miaoli County, Sanyi Township of Miaoli County, Zaoqiao Township of Miaoli County, Sanwan Township of Miaoli County, Dajia District of Taichung City, Qingshui District of Taichung City, Houli District of Taichung City, Shengang District of Taichung City, Shigang District of Taichung City, Waipu District of Taichung City, Da'an District of Taichung City, Dadu District of Taichung City, Wufeng District of Taichung City, Lugang Township of Changhua County, Hemei Township of Changhua County, Xianxi Township of Changhua County, Shengang Township of Changhua County, Fuxing Township of Changhua County, Xiushui Township of Changhua County, Huatan Township of Changhua County, Fenyan Township                                                                                                                                                                                                           |

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|   | <p>of Changhua County, Xihu Township of Changhua County, Tianzhong Township of Changhua County, Datsuen Township of Changhua County, Puyan Township of Changhua County, Puxin Township of Changhua County, Yongjing Township of Changhua County, Shetou Township of Changhua County, Beidou Township of Changhua County, Pitou Township of Changhua County, Nantou City of Nantou County, Puli Township of Nantou County, Caotun Township of Nantou County, Dounan Township of Yunlin County, Huwei Township of Yunlin County, Linnei Township of Yunlin County, Taibao City of Chiayi County, Minxiong Township of Chiayi County, Shuishang Township of Chiayi County, Zhongpu Township of Chiayi County, Yanshui District of Tainan City, Liuying District of Tainan City, Madou District of Tainan City, Xiaying District of Tainan City, Liujia District of Tainan City, Guantian District of Tainan City, Jiali District of Tainan City, Xuejia District of Tainan City, Xigang District of Tainan City, Qigu District of Tainan City, Jiangjun District of Tainan City, Beimen District of Tainan City, Xinhua District of Tainan City, Xinshi District of Tainan City, Anding District of Tainan City, Shanshang District of Tainan City, Guanmiao District of Tainan City, Linyuan District of Kaohsiung City, Dashu District of Kaohsiung City, Qiaotou District of Kaohsiung City, Yanchao District of Kaohsiung City, Alian District of Kaohsiung City, Luzhu District of Kaohsiung City, Hune District of Kaohsiung City, Jiading District of Kaohsiung City, Yongan District of Kaohsiung City, Mituo District of Kaohsiung City, Ziguan District of Kaohsiung City, Chaozhou Township of Pingtung County, Donggang Township of Pingtung County, Hengchun Township of Pingtung County, Wandan Township of Pingtung County, Changzhi Township of Pingtung County, Linluo Township of Pingtung County, Jiuru Township of Pingtung County, Neipu Township of Pingtung County, Xinyuan Township of Pingtung County, Su'ao Township of Yilan County, Toucheng Township of Yilan County, Jiaoxi Township of Yilan County, Zhuangwei Township of Yilan County, Yuanshan Township of Yilan County, Dongshan Township of Yilan County, Wujie Township of Yilan County, Taitung City of Taitung County</p> |
| 6 | <p>Shiding District of New Taipei City, Pinglin District of New Taipei City, Pingxi District of New Taipei City, Shuangxi District of New Taipei City, Gongliao District of New Taipei City, Emei Township of Hsinch County, Zhuolan Township of Miaoli County, Dahu Township of Miaoli County, Nanzhuang Township of Miaoli County, Xihu Township of Miaoli County, Shitan Township of Miaoli County, Tai'an Township of Miaoli County, Dongshi District of Taichung City, Xinshe District of Taichung City, Heping District of Taichung City, Ershui Township of Changhua County, Erlin Township of Changhua County, Tianwei Township of Changhua County, Fangyuan Township of Changhua County, Dacheng Township of Changhua County, Zhutang Township of Changhua County, Xizhou Township of Changhua County, Zhushan Township of Nantou County, Jiji Town of Nantou County, Mingjian Township of Nantou County, Lugu Township of Nantou County, Zhongliao Township of Nantou County, Yuchi Township of Nantou County, Guoshing Township of Nantou County, Shuili Township of Nantou County, Xinyi Township of Nantou County, Xiluo Township of Yunlin County, Tuku Township of Yunlin County, Beigang Township of Yunlin County, Gukeng Township of Yunlin County, Dapi Township of Yunlin County, Citong Township of Yunlin County, Erlun Township of Yunlin County, Lunbei Township of Yunlin County, Dongshi Township of</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

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|   | <p>Yunlin County, Baozhong Township of Yunlin County, Taixi Township of Yunlin County, Yuanchang Township of Yunlin County, Sihou Township of Yunlin County, Kouhu Township of Yunlin County, Shuilin Township of Yunlin County, Puzi City of Jiayi County, Budai Township of Jiayi County, Dalin Township of Chiayi County, Xikou Township of Chiayi County, Xingang Township of Chiayi County, Liujiao Township of Chiayi County, Dongshi Township of Chiayi County, Yizhu Township of Chiayi County, Lucao Township of Chiayi County, Zhuqi Township of Chiayi County, Meishan Township of Chiayi County, Fanlu Township of Chiayi County, Baihe District of Tainan City, Houbi District of Tainan City, Dongshan District of Tainan City, Danei District of Tainan City, Yujing District of Tainan City, Nanxi District of Tainan City, Nanhua District of Tainan City, Zuozhen District of Tainan City, Longqi District of Tainan City, Tianliao District of Kaohsiung City, Qishan District of Kaohsiung City, Meinong District of Kaohsiung City, Liugui District of Kaohsiung City, Jiaxian District of Kaohsiung City, Shanlin District of Kaohsiung City, Neimen District of Kaohsiung City, Ligang Township of Pingtung County, Yanpu Township of Pingtung County, Gaoshu Township of Pingtung County, Wanluan Township of Pingtung County, Zhutian Township of Pingtung County, Xinpi Township of Pingtung County, Fangliao Township of Pingtung County, Kanding Township of Pingding Township, Linbian Township of Pingtung County, Nanzhou Township of Pingtung County, Jiadong Township of Pingtung County, Checheng Township of Pingtung County, Manzhou Township of Pingtung County, Fangshan Township of Pingtung County, Huxi Township of Penghu County, Baisha Township of Penghu County, Xiyu Township of Penghu County, Wangan Township of Penghu County, Qimei Township of Penghu County, Sanxing Township of Yilan County, Fenglin Township of Hualien County, Yuli Township of Hualien County, Shoufeng Township of Hualien County, Guangfu Township of Hualien County, Fengbin Township of Hualien County, Ruisui Township of Hualien County, Fuli Township of Hualien County, Chenggung Township of Taitung County, Guanshan Township of Taitung County, Beinan Township of Taitung County, Luye Township of Taitung County, Chishang Township of Taitung County, Donghe Township of Taitung County, Changbin Township of Taitung County, Taimaili Township of Taitung County</p> |
| 7 | <p>Wulai District of New Taipei City, Fuxing Township of Taoyuan County, Jianshi Township of Hsinchu County, Wufeng Township of Hsinchu County, Renai Township of Nantou County, Mailiao Township of Yunlin County, Dapu Township of Chiayi County, Alishan Township of Chiayi County, Maolin District of Kaohsiung City, Taoyuan District of Kaohsiung City, Namaxia District of Kaohsiung City, Liuqiu Township of Pingtung County, Sandimen Township of Pingtung County, Wutai Township of Pingtung County, Majia Township of Pingtung County, Taiwu Township of Pingtung County, Laiyi Township of Pingtung County, Chunri Township of Pingtung County, Shizi Township of Pingtung County, Mudan Township of Pingtung County, Magong City of Penghu County, Datong Township of Yilan County, Nan'ao Township of Yilan County, Xincheng Township of Hualien County, Xiulin Township of Hualien County, Wanrong Township of Hualien County, Zhuoxi Township of Hualien County, Dawu Township of Taitung County, Ludao Township of Taitung County, Haiduan Township of Taitung County, Yanping Township of Taitung County, Jinfeng Township of Taitung County, Daren Township of Taitung County, Lanyu Township of Taitung County</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

**Table 2 Geographic Stratifications**

| Geographic Area                              | Level Code | Combined Level Code |
|----------------------------------------------|------------|---------------------|
| Taipei City, New Taipei City, Keelung, Yilan | 1          | 1                   |
|                                              | 2          | 2                   |
|                                              | 3, 4       | 3                   |
|                                              | 5, 6, 7    | 4                   |
| Taoyuan, Hsinchu, Miaoli                     | 1, 2       | 1                   |
|                                              | 3, 4       | 2                   |
|                                              | 5, 6, 7    | 3                   |
| Taichung, Changhua, Nantou                   | 1, 2       | 1                   |
|                                              | 3, 4       | 2                   |
|                                              | 5          | 3                   |
|                                              | 6, 7       | 4                   |
| Yunlin, Chiayi, Tainan                       | 1, 2, 3    | 1                   |
|                                              | 4, 5       | 2                   |
|                                              | 6, 7       | 3                   |
| Kaohsiung, Pingtung, Penghu                  | 1, 2       | 1                   |
|                                              | 3, 4       | 2                   |
|                                              | 5, 6, 7    | 3                   |
| Hualien, Taitung                             | 4, 5       | 1                   |
|                                              | 6, 7       | 2                   |

**(1) Pilot Test**

A stratified three-stage probability proportional to size sampling was adopted for the pre-test interviews. Since few completed samples were expected during the pretest, the stratification system used in this project's formal survey was adjusted in order to meet the project deadline and save survey costs. With the Hualien and Taitung area excluded, only one geographic stratum was sampled within each of the five geographic areas: "Taipei City, New Taipei City, Keelung, Yilan," "Taoyuan, Hsinchu, Miaoli," "Taichung, Changhua, Nantou," "Yunlin, Chiayi, Tainan," and "Kaohsiung, Pingtung, Penghu." Once the proportions of population in the geographic areas were calculated based on the demographic data provided by the Ministry of the Interior at the end of December 2019, the numbers of samples for all geographic areas were determined based on the proportions, with the numbers of townships and the expected number of completed samples within each township adjusted. The actual number of successful samples was 30.

## **(2) Formal survey**

Prior to conducting the formal survey, the proportions of population in the geographic areas were calculated based on demographic data provided by the Ministry of the Interior at the end of December 2019, and the number of samples for all geographic areas were determined based on the proportions, with the number of townships and the expected number of completed samples within every township adjusted. Consequently, a total of 1,100 samples were expected to be completed in each of the four investigations. In view of the small population and extremely uneven distribution of population in the Hualien and Taitung area, stratified two-stage PPS (probabilities proportional to size) sampling was actually used, while stratified three-stage PPS sampling was used in other areas. During the third stage, a survey point was set up at gathering places (such as village office, activity center, and market) in the townships selected to conduct the survey with local residents.

The sampling units in each stage are explained as below.

- During two-stage sampling, the primary sampling units were “township” and then “people.” All of the “districts and townships” in the geographic stratum were included.
- During three-stage sampling, the primary sampling units were “townships,” and the second sampling units were “villages.” The last sampling units were “people.”

During the implementation of the survey, the gender and age structures of all communities were strictly controlled with the view to ensuring that the structure of the survey results is similar to that of the target population. In case of any inconsistency between obtained samples and the population, the results were weighted based on variables like gender, age, and community. The weighted sample number in every age group could not exceed the original sample number by 60 percent.

## **(3) Allocation of samples**

To meet the request of the agency that commissioned this project, at least 1,160 valid samples were investigated in each questionnaire with a sampling error of within  $\pm 3$  percent at a 95 percent confidence level.

**Table 3 Plan for Allocation of Samples at Survey Sites in All Communities**

| Geographic stratum                           | Level    | No. of People Aged 16 and above | Population Percentage | Planned Allocation of Samples | No. of Townships and Districts Selected | No. of Villages Selected | Expected No. of Samples by Village | Total No. of Samples by Village |
|----------------------------------------------|----------|---------------------------------|-----------------------|-------------------------------|-----------------------------------------|--------------------------|------------------------------------|---------------------------------|
| Taipei City, New Taipei City, Keelung, Yilan | Level 1  | 1,221,392                       | 18.82%                | 66                            | 3                                       | 2                        | 11                                 | 6                               |
|                                              | Level 2  | 3,205,432                       | 49.40%                | 174                           | 7                                       | 2                        | 12                                 | 14                              |
|                                              | Level 3  | 1,658,774                       | 25.56%                | 90                            | 4                                       | 2                        | 11                                 | 8                               |
|                                              | Level 4  | 403,164                         | 6.21%                 | 22                            | 1                                       | 2                        | 11                                 | 2                               |
|                                              | Subtotal | 6,488,762                       | 32.06%                | 353                           | 14                                      |                          |                                    | 30                              |
| Taoyuan, Hsinchu, Miaoli                     | Level 1  | 1,176,640                       | 36.79%                | 64                            | 3                                       | 2                        | 11                                 | 6                               |
|                                              | Level 2  | 1,499,522                       | 46.89%                | 82                            | 3                                       | 2                        | 14                                 | 6                               |
|                                              | Level 3  | 521,746                         | 16.32%                | 28                            | 1                                       | 2                        | 14                                 | 2                               |
|                                              | Subtotal | 3,197,908                       | 15.80%                | 174                           | 7                                       |                          |                                    | 14                              |
| Taichung, Changhua, Nantou                   | Level 1  | 923,773                         | 23.57%                | 50                            | 2                                       | 2                        | 13                                 | 4                               |
|                                              | Level 2  | 1,283,279                       | 32.74%                | 70                            | 3                                       | 2                        | 12                                 | 6                               |
|                                              | Level 3  | 1,279,001                       | 32.63%                | 70                            | 3                                       | 2                        | 12                                 | 6                               |
|                                              | Level 4  | 433,564                         | 11.06%                | 24                            | 1                                       | 2                        | 12                                 | 2                               |
|                                              | Subtotal | 3,919,617                       | 19.37%                | 213                           | 9                                       |                          |                                    | 18                              |
| Yunlin, Chiayi, Tainan                       | Level 1  | 930,101                         | 31.90%                | 51                            | 2                                       | 2                        | 13                                 | 4                               |
|                                              | Level 2  | 1,214,657                       | 41.65%                | 66                            | 2                                       | 2                        | 17                                 | 4                               |
|                                              | Level 3  | 771,364                         | 26.45%                | 42                            | 2                                       | 2                        | 10                                 | 4                               |
|                                              | Subtotal | 2,916,122                       | 14.41%                | 159                           | 6                                       |                          |                                    | 12                              |
| Kaohsiung, Pingtung, Penghu                  | Level 1  | 1,134,075                       | 35.00%                | 62                            | 2                                       | 2                        | 15                                 | 4                               |
|                                              | Level 2  | 993,762                         | 30.67%                | 54                            | 2                                       | 2                        | 14                                 | 4                               |
|                                              | Level 3  | 1,111,938                       | 34.32%                | 60                            | 2                                       | 2                        | 15                                 | 4                               |
|                                              | Subtotal | 3,239,775                       | 16.01%                | 176                           | 6                                       |                          |                                    | 12                              |
| Hualien, Taitung                             | Level 1  | 251,969                         | 53.14%                | 14                            | 1                                       | 1                        | 14                                 | 1                               |
|                                              | Level 2  | 222,160                         | 46.86%                | 12                            | 1                                       | 1                        | 12                                 | 1                               |
|                                              | Subtotal | 474,129                         | 2.34%                 | 26                            | 2                                       |                          |                                    | 2                               |
| Total                                        |          | 20,236,313                      | 100.00%               | 1,100                         | 44                                      |                          |                                    | 88                              |

Since the original allocation of the survey site sampling is based on proportions of the entire population, calculated decimal numbers had to be rounded to the nearest integers when the survey was actually performed. Moreover, to meet a specific requirement this year that the number of weighted samples in every age group must not exceed the original number of samples by 60 percent, the samples were allocated and adjusted accordingly in this project. The adjusted allocation of survey site sampling is shown in the table below.

**Table 4 Plan for Allocation of Samples at Survey Sites in All Communities after Adjustment by Age**

|                                              |          |                                 |                       | Originally Planned Allocation of Samples at Survey Sites |                                         |                          |                                    |                                 |                                  | Adjustment of Site Allocation Based on Age Distribution in the Population (Expected No. by Site) |                                         |                                         |                                         |                                         |                                                |                                    |                                                              |
|----------------------------------------------|----------|---------------------------------|-----------------------|----------------------------------------------------------|-----------------------------------------|--------------------------|------------------------------------|---------------------------------|----------------------------------|--------------------------------------------------------------------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|------------------------------------------------|------------------------------------|--------------------------------------------------------------|
| Geographic stratum                           | Level    | No. of People Aged 16 and above | Population Percentage | Planned Allocation of Samples                            | No. of Townships and Districts Selected | No. of Villages Selected | Expected No. of Samples by Village | Total No. of Samples by Village | Expected No. of Samples by Level | Expected No. of Samples with Ages 16-25                                                          | Expected No. of Samples with Ages 26-35 | Expected No. of Samples with Ages 36-45 | Expected No. of Samples with Ages 46-55 | Expected No. of Samples with Ages 56-65 | Expected No. of Samples with Ages 66 and Above | Expected No. of Samples by Village | Expected No. of Completed Samples in Each Level by Age Group |
| Taipei City, New Taipei City, Keelung, Yilan | Level 1  | 1,221,392                       | 18.82%                | 66                                                       | 3                                       | 2                        | 11                                 | 6                               | 66                               | 1                                                                                                | 2                                       | 2                                       | 2                                       | 2                                       | 2                                              | 11                                 | 66                                                           |
|                                              | Level 2  | 3,205,432                       | 49.40%                | 174                                                      | 7                                       | 2                        | 12                                 | 14                              | 168                              | 2                                                                                                | 2                                       | 2                                       | 2                                       | 2                                       | 2                                              | 12                                 | 168                                                          |
|                                              | Level 3  | 1,658,774                       | 25.56%                | 90                                                       | 4                                       | 2                        | 11                                 | 8                               | 88                               | 2                                                                                                | 2                                       | 2                                       | 2                                       | 2                                       | 1                                              | 11                                 | 88                                                           |
|                                              | Level 4  | 403,164                         | 6.21%                 | 22                                                       | 1                                       | 2                        | 11                                 | 2                               | 22                               | 2                                                                                                | 2                                       | 2                                       | 2                                       | 2                                       | 1                                              | 11                                 | 22                                                           |
|                                              | Subtotal | 6,488,762                       | 32.06%                | 353                                                      | 14                                      |                          |                                    | 30                              | 344                              | 7                                                                                                | 8                                       | 8                                       | 8                                       | 8                                       | 6                                              | 45                                 | 344                                                          |
| Taoyuan, Hsinchu, Miaoli                     | Level 1  | 1,176,640                       | 36.79%                | 64                                                       | 3                                       | 2                        | 11                                 | 6                               | 66                               | 2                                                                                                | 2                                       | 2                                       | 2                                       | 2                                       | 1                                              | 11                                 | 66                                                           |
|                                              | Level 2  | 1,499,522                       | 46.89%                | 82                                                       | 3                                       | 2                        | 14                                 | 6                               | 84                               | 3                                                                                                | 3                                       | 2                                       | 2                                       | 2                                       | 2                                              | 14                                 | 84                                                           |
|                                              | Level 3  | 521,746                         | 16.32%                | 28                                                       | 1                                       | 2                        | 14                                 | 2                               | 28                               | 2                                                                                                | 2                                       | 2                                       | 3                                       | 2                                       | 1                                              | 12                                 | 24                                                           |
|                                              | Subtotal | 3,197,908                       | 15.80%                | 174                                                      | 7                                       |                          |                                    | 14                              | 178                              | 7                                                                                                | 7                                       | 6                                       | 7                                       | 6                                       | 4                                              | 37                                 | 174                                                          |
| Taichung, Changhua, Nantou                   | Level 1  | 923,773                         | 23.57%                | 50                                                       | 2                                       | 2                        | 13                                 | 4                               | 52                               | 2                                                                                                | 2                                       | 2                                       | 3                                       | 2                                       | 2                                              | 13                                 | 52                                                           |
|                                              | Level 2  | 1,283,279                       | 32.74%                | 70                                                       | 3                                       | 2                        | 12                                 | 6                               | 72                               | 2                                                                                                | 2                                       | 2                                       | 2                                       | 2                                       | 2                                              | 12                                 | 72                                                           |
|                                              | Level 3  | 1,279,001                       | 32.63%                | 70                                                       | 3                                       | 2                        | 12                                 | 6                               | 72                               | 2                                                                                                | 2                                       | 2                                       | 2                                       | 2                                       | 2                                              | 12                                 | 72                                                           |
|                                              | Level 4  | 433,564                         | 11.06%                | 24                                                       | 1                                       | 2                        | 12                                 | 2                               | 24                               | 2                                                                                                | 3                                       | 2                                       | 2                                       | 2                                       | 1                                              | 12                                 | 24                                                           |
|                                              | Subtotal | 3,919,617                       | 19.37%                | 213                                                      | 9                                       |                          |                                    | 18                              | 220                              | 8                                                                                                | 9                                       | 8                                       | 9                                       | 8                                       | 7                                              | 49                                 | 220                                                          |
| Yunlin, Chiayi, Tainan                       | Level 1  | 930,101                         | 31.90%                | 51                                                       | 2                                       | 2                        | 13                                 | 4                               | 52                               | 3                                                                                                | 3                                       | 2                                       | 2                                       | 2                                       | 1                                              | 13                                 | 52                                                           |
|                                              | Level 2  | 1,214,657                       | 41.65%                | 66                                                       | 2                                       | 2                        | 17                                 | 4                               | 68                               | 2                                                                                                | 3                                       | 3                                       | 3                                       | 3                                       | 3                                              | 17                                 | 68                                                           |
|                                              | Level 3  | 771,364                         | 26.45%                | 42                                                       | 2                                       | 2                        | 10                                 | 4                               | 40                               | 1                                                                                                | 1                                       | 2                                       | 2                                       | 2                                       | 2                                              | 10                                 | 40                                                           |
|                                              | Subtotal | 2,916,122                       | 14.41%                | 159                                                      | 6                                       |                          |                                    | 12                              | 160                              | 6                                                                                                | 7                                       | 7                                       | 7                                       | 7                                       | 6                                              | 40                                 | 160                                                          |
| Kaohsiung, Pingtung, Penghu                  | Level 1  | 1,134,075                       | 35.00%                | 62                                                       | 2                                       | 2                        | 15                                 | 4                               | 60                               | 3                                                                                                | 3                                       | 2                                       | 3                                       | 2                                       | 2                                              | 15                                 | 60                                                           |
|                                              | Level 2  | 993,762                         | 30.67%                | 54                                                       | 2                                       | 2                        | 14                                 | 4                               | 56                               | 2                                                                                                | 3                                       | 3                                       | 2                                       | 2                                       | 2                                              | 14                                 | 56                                                           |
|                                              | Level 3  | 1,111,938                       | 34.32%                | 60                                                       | 2                                       | 2                        | 15                                 | 4                               | 60                               | 3                                                                                                | 3                                       | 3                                       | 2                                       | 2                                       | 2                                              | 15                                 | 60                                                           |
|                                              | Subtotal | 3,239,775                       | 16.01%                | 176                                                      | 6                                       |                          |                                    | 12                              | 176                              | 8                                                                                                | 9                                       | 8                                       | 7                                       | 6                                       | 6                                              | 44                                 | 176                                                          |
| Hualien, Taitung                             | Level 1  | 251,969                         | 53.14%                | 14                                                       | 1                                       | 1                        | 14                                 | 1                               | 14                               | 2                                                                                                | 3                                       | 3                                       | 3                                       | 2                                       | 1                                              | 14                                 | 14                                                           |
|                                              | Level 2  | 222,160                         | 46.86%                | 12                                                       | 1                                       | 1                        | 12                                 | 1                               | 12                               | 2                                                                                                | 3                                       | 2                                       | 2                                       | 2                                       | 1                                              | 12                                 | 12                                                           |
|                                              | Subtotal | 474,129                         | 2.34%                 | 26                                                       | 2                                       |                          |                                    | 2                               | 26                               | 4                                                                                                | 6                                       | 5                                       | 5                                       | 4                                       | 2                                              | 26                                 | 26                                                           |
| Total                                        |          | 20,236,313                      | 100.00%               | 1,100                                                    | 44                                      |                          |                                    | 88                              | 1,104                            |                                                                                                  |                                         |                                         |                                         |                                         |                                                | 0                                  | 1,100                                                        |

### 3. Survey period

The interviews took place in the selected areas between April 15 and June 5, 2020.

**Table 5 Implementation of Formal Sampling**

| Sampling Frame                               |          | Selected                              | By Survey Site                                   |                                                   |
|----------------------------------------------|----------|---------------------------------------|--------------------------------------------------|---------------------------------------------------|
| Area                                         | Level    | District or Township for Survey       | No. of Expected Samples (1,160 samples in total) | No. of Completed Samples (1,163 samples in total) |
| Taipei City, New Taipei City, Keelung, Yilan | Level 1  | Xinyi District of Taipei City         | 22                                               | 22                                                |
|                                              |          | Zhongzheng District of Taipei City    | 22                                               | 22                                                |
|                                              |          | Datong District of Taipei City        | 22                                               | 22                                                |
|                                              | Level 2  | Wenshan District of Taipei City       | 24                                               | 24                                                |
|                                              |          | Banqiao District of New Taipei City   | 24                                               | 24                                                |
|                                              |          | Xinzhuang District of New Taipei City | 24                                               | 24                                                |
|                                              |          | Nangang District of Taipei City       | 24                                               | 24                                                |
|                                              |          | Tamsui District of New Taipei City    | 24                                               | 24                                                |
|                                              |          | Luzhou District of New Taipei City    | 24                                               | 24                                                |
|                                              |          | Linkou District of New Taipei City    | 24                                               | 24                                                |
|                                              | Level 3  | Xindian District of New Taipei City   | 22                                               | 22                                                |
|                                              |          | Ren'ai District of Keelung City       | 22                                               | 22                                                |
|                                              |          | Zhongshan District of Keelung City    | 22                                               | 22                                                |
|                                              |          | Yilan City of Yilan County            | 22                                               | 22                                                |
|                                              | Level 4  | Yuanshan Township of Yilan County     | 22                                               | 22                                                |
|                                              | Subtotal |                                       | 344                                              | 344                                               |
| Taoyuan, Hsinchu, Miaoli                     | Level 1  | Taoyuan District of Taoyuan City      | 22                                               | 22                                                |
|                                              |          | East District of Hsinchu City         | 22                                               | 22                                                |
|                                              |          | North District of Hsinchu City        | 22                                               | 22                                                |
|                                              | Level 2  | Hukou Township of Hsinchu County      | 28                                               | 28                                                |
|                                              |          | Longtan District of                   | 28                                               | 28                                                |

| Sampling Frame              |         | Selected                             | By Survey Site                                   | By Survey Site                                    |
|-----------------------------|---------|--------------------------------------|--------------------------------------------------|---------------------------------------------------|
| Area                        | Level   | District or Township for Survey      | No. of Expected Samples (1,160 samples in total) | No. of Completed Samples (1,163 samples in total) |
|                             |         | Taoyuan City                         |                                                  |                                                   |
|                             |         | Bade District of Taoyuan City        | 28                                               | 28                                                |
|                             | Level 3 | Dahu Township of Miaoli Count        | 24                                               | 24                                                |
|                             |         | Subtotal                             | 174                                              | 174                                               |
| Taichung, Changhua, Nantou  | Level 1 | Xitun District of Taichung City      | 26                                               | 26                                                |
|                             |         | South District of Taichung City      | 26                                               | 26                                                |
|                             | Level 2 | Changhua City of Changhua County     | 24                                               | 24                                                |
|                             |         | Taiping District of Taichung City    | 24                                               | 24                                                |
|                             |         | Longjing District of Taichung City   | 24                                               | 24                                                |
|                             | Level 3 | Nantou City of Nantou County         | 24                                               | 24                                                |
|                             |         | Puxin Township of Changhua County    | 24                                               | 24                                                |
|                             |         | Puli Township of Nantou County       | 24                                               | 24                                                |
|                             | Level 4 | Mingjian Township of Nantou County   | 24                                               | 24                                                |
|                             |         | Subtotal                             | 220                                              | 220                                               |
| Yunlin, Chiayi, Tainan      | Level 1 | Yongkang District of Tainan City     | 26                                               | 26                                                |
|                             |         | West Central District of Tainan City | 26                                               | 26                                                |
|                             | Level 2 | West District of Chiayi City         | 34                                               | 34                                                |
|                             |         | Douliu City of Yunlin County         | 34                                               | 34                                                |
|                             | Level 3 | Xingang Township of Chiayi County    | 20                                               | 20                                                |
|                             |         | Puzi City of Chiayi County           | 20                                               | 20                                                |
|                             |         | Subtotal                             | 160                                              | 160                                               |
| Kaohsiung, Pingtung, Penghu | Level 1 | Yancheng District of Kaohsiung City  | 30                                               | 30                                                |
|                             |         | Gushan District of Kaohsiung City    | 30                                               | 30                                                |
|                             | Level 2 | Xiaogang District of Kaohsiung City  | 28                                               | 28                                                |

| Sampling Frame   |         | Selected                             | By Survey Site                                   | By Survey Site                                    |
|------------------|---------|--------------------------------------|--------------------------------------------------|---------------------------------------------------|
| Area             | Level   | District or Township for Survey      | No. of Expected Samples (1,160 samples in total) | No. of Completed Samples (1,163 samples in total) |
|                  |         | Pingtung City of Pingtung County     | 28                                               | 28                                                |
|                  | Level 3 | Meinong District of Kaohsiung City   | 30                                               | 30                                                |
|                  |         | Baisha Township of Penghu County     | 30                                               | 30                                                |
|                  |         | Subtotal                             | 176                                              | 176                                               |
| Hualien, Taitung | Level 1 | Ji'an Township of Hualien County     | 14                                               | 15                                                |
|                  | Level 2 | Chenggong Township of Taitung County | 12                                               | 14                                                |
|                  |         | Subtotal                             | 26                                               | 29                                                |
| Kinmen, Matsu    |         | Kinmen County                        | 30                                               | 30                                                |
|                  |         | Lianjiang County                     | 30                                               | 30                                                |
|                  |         | Subtotal                             | 60                                               | 60                                                |
| Grand total      |         |                                      | 1,160                                            | 1,163                                             |

The differences between the actual number of completed samples and the planned number of samples at survey sites are explained as below:

- (1) This survey was completely implemented as planned in terms of sites and allocation of samples. However, due to reasons like age control and people's willingness to be interviewed at different sites, fewer survey samples were completed than expected at several sites.
- (2) Although fewer samples were collected than planned at some sites, samples of all areas were verified to represent the population in terms of distribution, through a test prior to weighting (See Table 6).
- (3) Table 6 shows the planned numbers of samples and the actual numbers of valid samples completed by interviewers at selected sites. These numbers are representative prior to weighting. However, the survey analysis and results adopted by this report were tested and weighted based on the registered domicile of interviewees and the data of the entire population. Since the survey did not limit the interviewees to those with their domicile registered where they received the interview and the survey was simultaneously conducted in Taiwan proper, Kinmen and Matsu this year, all the data were consolidated, tested, weighted and grouped based on the registered domicile of the interviewees.

**Table 6 Contingency Table for Telecommunications Market Survey Site before Weighting**

| Allocation of Survey Site No.                | Allocation of Samples |               | No. of Samples before Weighting |               | Chi-Square Test before Weighting                                                                                                                                                                                  |
|----------------------------------------------|-----------------------|---------------|---------------------------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                              | No. of People         | Percentage    | No. of People                   | Percentage    |                                                                                                                                                                                                                   |
| <b>Total</b>                                 | <b>1,100</b>          | <b>100.0%</b> | <b>1,103</b>                    | <b>100.0%</b> | The Chi-square value is 0.543, and p-value (= 0.99) is below the accepted significance level of 5%, meaning no significant difference between the distribution of samples and the original allocation of samples. |
| <b>Survey Site</b>                           |                       |               |                                 |               |                                                                                                                                                                                                                   |
| Taipei City, New Taipei City, Keelung, Yilan | 344                   | 31.5%         | 344                             | 31.1%         |                                                                                                                                                                                                                   |
| Taoyuan, Hsinchu, Miaoli                     | 174                   | 15.6%         | 174                             | 15.7%         |                                                                                                                                                                                                                   |
| Taichung, Changhua, Nantou                   | 220                   | 19.6%         | 220                             | 19.9%         |                                                                                                                                                                                                                   |
| Yunlin, Chiayi, Tainan                       | 160                   | 14.9%         | 160                             | 14.5%         |                                                                                                                                                                                                                   |
| Kaohsiung, Pingtung, Penghu                  | 176                   | 16.0%         | 176                             | 15.9%         |                                                                                                                                                                                                                   |
| Hualien, Taitung                             | 26                    | 2.4%          | 29                              | 2.6%          |                                                                                                                                                                                                                   |

## C. Implementation of Survey

### 1. Timeline

Before the survey was formally launched, preparations for questionnaires and related affairs were undertaken from February. After the questionnaires were modified based on the conclusions from the meeting with the agency that commissioned this study, the survey formally began on April 15, 2020. The timeline was:

(1) Preparation period: February 20 to April 14, 2020.

(2) Survey period:

Phase 1: April 2 to April 10, 2020.

Phase 2: April 15 to June 5, 2020.

(3) Review period: June 5 to June 14, 2020

### 2. Survey method

Face-to-face interviews were employed for this survey; a computer-assisted interview survey system was used during the interview, and was supplemented with printed questionnaires.

### 3. Statistical analysis method

#### (1) Sample representativeness and weighting

After the survey results were reviewed, the NPAR Chi-square test was used to examine the difference between the allocation of samples and the structure of the population in terms of age, gender, and population percentage, to enhance the representativeness and reliability of the survey so that these samples could reflect the population structure. In case a significant difference in structure was identified between the samples and the population. Weighting was used to make the sample structure identical to that of the population.

About weighting, the raking method was used to adjust the sampling weights based on variables in the order of gender, age and area of registered household until no significant difference existed between the allocation of samples and the population in every variable.

All the data in the results were multiplied by the adjustment weight.  $\frac{N_i}{N} / \frac{n'_i}{n}$ ,  $N_i$  and  $n'_i$  represent the number of the population and the number of sample population weighted in the Cross Group  $i$ , while  $N$  and  $n$  represent the number of the total population and the number of the total sample population weighted. This way, the sampling distribution was completely the same as the population distribution after weighting. The last weight was gained by multiplying all the adjustment weights.

#### (2) Reliability analysis

Reliability refers to trustworthiness or consistency of a survey. Namely, when the survey is performed under the same or similar conditions, consistent or stable results can be obtained. Cronbach's (1951)  $\alpha$  reliability coefficient is currently the most used reliability indicator. Nunnally (1967) suggests that a reliability of 0.7 or higher, also known as high reliability, is acceptable.

#### (3) Frequency

How people understand and rate each of the aspects can be realized through the data presented in allocation of frequencies and percentages in all questions.

#### (4) Cross analysis and Chi-square test

A cross analysis table was established with the basic data for "all the issues" to realize whether a difference existed between the respondents with different backgrounds in all the issues. Pearson's Chi-square test was used in the cross table. The Chi-square test value ( $W$ ) is defined as below:

$$W = \sum_{i=1}^r \sum_{j=1}^c \frac{(O_{ij} - E_{ij})^2}{E_{ij}} \sim \chi^2((r-1)(c-1))$$

, wherein

$O_{ij}$  is the observed frequency from Row j, Column i, and

$E_{ij}$  is the expected frequency from Row j, Column i.

When p-value in the Chi-square test is less than 0.05, the two variables are not independent at a 95% confidence level. That is, a significant statistic difference exists between the respondents with different backgrounds in the issue.

#### (5) Analysis of variance (ANOVA)

The total variation can be divided into the variation between groups and the variation within groups. Analysis of variance is used to calculate the rate of variation between groups to variation within groups. If the variation between groups is significantly greater than the variation within groups, significant differences among group means exist between two or more groups. If the variation between groups is not highly different from the variation within groups, few differences exist among groups. The ANOVA F-test calculations are as below.

$$F = \frac{MS_b}{MS_w} = \frac{SS_b / k - 1}{SS_w / n - k}$$

, where n represents the number of samples and k represents the number of groups,

$$SS_b = n \sum_{i=1}^k (\bar{X}_i - \bar{X})^2$$

is the total sum of squared deviations of group means from grand mean, and

$$SS_w = \sum_{i=1}^k \sum_{j=1}^{n_i} (X_{ij} - \bar{X}_i)^2$$

is the total sum of the squared deviations within groups.

### 4. Sample structure

As of June 14, 2020, the survey for this research has been implemented and reviewed by the research team, with 1,103 questionnaires completed<sup>1</sup> as valid samples.

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<sup>1</sup> This survey was conducted in Taiwan, Penghu, Kinmen and Matsu. Since Kinmen's and Matsu's populations are too small for analysis, the samples of Taiwan proper (including Penghu) were separated from those of Kinmen and Matsu. The numbers were weighted by city or county, and samples were regrouped according to where interviewees register their domicile. (Namely, an interviewee who registered his domicile in Kinmen or Matsu and received the interview in Taiwan would be classified as a valid sample of Kinmen and Matsu; while an interviewee who registered his domicile in Taiwan proper

The sample structure is shown in Table 7.

**Table 7 Contingency Table for Telecommunications Market Survey Samples**

| Population variables  | Population        |               | No. of Samples before Weighting |               | No. of Samples after Weighting |               | Chi-Square Test before Weighting                                                                                                                                                                                   | Chi-Square Test after Weighting                                                                                                                                                                                     |
|-----------------------|-------------------|---------------|---------------------------------|---------------|--------------------------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                       | No. of People     | Percentage    | No. of People                   | Percentage    | No. of People                  | Percentage    |                                                                                                                                                                                                                    |                                                                                                                                                                                                                     |
| <b>Total</b>          | <b>20,236,313</b> | <b>100.0%</b> | <b>1,103</b>                    | <b>100.0%</b> | <b>1,103</b>                   | <b>100.0%</b> |                                                                                                                                                                                                                    |                                                                                                                                                                                                                     |
| <b>Gender</b>         |                   |               |                                 |               |                                |               | The Chi-square value is 1.02, and p-value (= 0.313) is below the accepted significance level of 5%, meaning no significant difference between samples and the target population in distribution of gender.         | The Chi-square value is 0.000, and p-value (= 0.999) is below the accepted significance level of 5%, meaning no significant difference between samples and the target population in distribution of gender.         |
| Male                  | 9,957,272         | 49.2%         | 526                             | 47.7%         | 543                            | 49.2%         |                                                                                                                                                                                                                    |                                                                                                                                                                                                                     |
| Female                | 10,279,041        | 50.8%         | 577                             | 52.3%         | 560                            | 50.8%         |                                                                                                                                                                                                                    |                                                                                                                                                                                                                     |
| <b>Age</b>            |                   |               |                                 |               |                                |               | The Chi-square value is 15.766, and p-value (= 0.008) is below the accepted significance level of 5%, meaning significant difference between samples and the target population in distribution of age.             | The Chi-square value is 0.000, and p-value (= 1.000) is below the accepted significance level of 5%, meaning no significant difference between samples and the target population in distribution of age.            |
| Age 16-25             | 2,848,953         | 14.1%         | 185                             | 16.8%         | 155                            | 14.1%         |                                                                                                                                                                                                                    |                                                                                                                                                                                                                     |
| Age 26-35             | 3,226,276         | 15.9%         | 199                             | 18.0%         | 176                            | 15.9%         |                                                                                                                                                                                                                    |                                                                                                                                                                                                                     |
| Age 36-45             | 3,901,910         | 19.3%         | 197                             | 17.9%         | 213                            | 19.3%         |                                                                                                                                                                                                                    |                                                                                                                                                                                                                     |
| Age 46-55             | 3,581,873         | 17.7%         | 194                             | 17.6%         | 195                            | 17.7%         |                                                                                                                                                                                                                    |                                                                                                                                                                                                                     |
| Age 56-65             | 3,389,119         | 16.7%         | 181                             | 16.4%         | 185                            | 16.7%         |                                                                                                                                                                                                                    |                                                                                                                                                                                                                     |
| <b>City or County</b> |                   |               |                                 |               |                                |               | The Chi-square value is 317.906, and p-value (=0.000) is below the accepted significance level of 5%, meaning significant difference between samples and the target population in distribution of city and county. | The Chi-square value is 0.000, and p-value (=1.000) is below the accepted significance level of 5%, meaning no significant difference between samples and the target population in distribution of city and county. |
| New Taipei City       | 3,496,771         | 17.3%         | 169                             | 15.3%         | 191                            | 17.3%         |                                                                                                                                                                                                                    |                                                                                                                                                                                                                     |
| Taipei City           | 2,268,067         | 11.2%         | 111                             | 10.1%         | 124                            | 11.2%         |                                                                                                                                                                                                                    |                                                                                                                                                                                                                     |
| Taoyuan City          | 1,891,291         | 9.3%          | 88                              | 8.0%          | 103                            | 9.3%          |                                                                                                                                                                                                                    |                                                                                                                                                                                                                     |
| Taichung City         | 2,386,347         | 11.8%         | 88                              | 8.0%          | 130                            | 11.8%         |                                                                                                                                                                                                                    |                                                                                                                                                                                                                     |
| Tainan City           | 1,637,097         | 8.1%          | 53                              | 4.8%          | 89                             | 8.1%          |                                                                                                                                                                                                                    |                                                                                                                                                                                                                     |
| Kaohsiung City        | 2,420,482         | 12.0%         | 104                             | 9.4%          | 132                            | 12.0%         |                                                                                                                                                                                                                    |                                                                                                                                                                                                                     |
| Yilan County          | 396,287           | 2.0%          | 44                              | 4.0%          | 22                             | 2.0%          |                                                                                                                                                                                                                    |                                                                                                                                                                                                                     |
| Hsinch County         | 466,323           | 2.3%          | 31                              | 2.8%          | 25                             | 2.3%          |                                                                                                                                                                                                                    |                                                                                                                                                                                                                     |
| Miaoli County         | 473,111           | 2.3%          | 23                              | 2.1%          | 26                             | 2.3%          |                                                                                                                                                                                                                    |                                                                                                                                                                                                                     |
| Changhua County       | 1,096,893         | 5.4%          | 66                              | 6.0%          | 60                             | 5.4%          |                                                                                                                                                                                                                    |                                                                                                                                                                                                                     |
| Nantou County         | 436,377           | 2.2%          | 63                              | 5.7%          | 24                             | 2.2%          |                                                                                                                                                                                                                    |                                                                                                                                                                                                                     |
| Yilan County          | 597,967           | 3.0%          | 41                              | 3.7%          | 33                             | 3.0%          |                                                                                                                                                                                                                    |                                                                                                                                                                                                                     |
| Chiayi County         | 452,239           | 2.2%          | 44                              | 4.0%          | 25                             | 2.2%          |                                                                                                                                                                                                                    |                                                                                                                                                                                                                     |
| Pingtung County       | 725,792           | 3.6%          | 34                              | 3.1%          | 40                             | 3.6%          |                                                                                                                                                                                                                    |                                                                                                                                                                                                                     |
| Taitung County        | 189,642           | 0.9%          | 27                              | 2.4%          | 10                             | 0.9%          |                                                                                                                                                                                                                    |                                                                                                                                                                                                                     |
| Hualien County        | 284,487           | 1.4%          | 14                              | 1.3%          | 16                             | 1.4%          |                                                                                                                                                                                                                    |                                                                                                                                                                                                                     |
| Penghu County         | 93,501            | 0.5%          | 30                              | 2.7%          | 5                              | 0.5%          |                                                                                                                                                                                                                    |                                                                                                                                                                                                                     |
| Keelung City          | 327,637           | 1.6%          | 20                              | 1.8%          | 18                             | 1.6%          |                                                                                                                                                                                                                    |                                                                                                                                                                                                                     |
| Hsinch City           | 367,183           | 1.8%          | 25                              | 2.3%          | 20                             | 1.8%          |                                                                                                                                                                                                                    |                                                                                                                                                                                                                     |
| Chiayi City           | 228,819           | 1.1%          | 28                              | 2.5%          | 12                             | 1.1%          |                                                                                                                                                                                                                    |                                                                                                                                                                                                                     |

Note: The source of the population data is the 2018 December Demographic Data of Households in Each Village provided on the Open Data platform by the Ministry of the Interior.

Note: The numbers of samples by county or city shown in Table 7 were weighted based on the registered domicile and the consistency between numbers of samples before and after weighting was tested.

and received the interview in Kinmen or Matsu would be processed as a valid sample of Taiwan proper.) This led to a slight difference between the final numbers of valid samples and the numbers of completed samples shown in Tables 5 & 6, which were sorted by “survey site.”

The change rate of the numbers of sample in all age groups after weighting is shown in Table 8. They are all in compliance with the requirement that no number of sample in any age group shall increase or reduce by more than 60% after weighting.

**Table 8 Change Rate of the Numbers of Sample by Age Group after Weighting**

| Population variables | No. of Samples before Weighting |               | No. of Samples after Weighting |               | Change Rate of the No. of Sample by Age Group after Weighting |
|----------------------|---------------------------------|---------------|--------------------------------|---------------|---------------------------------------------------------------|
|                      | No. of People                   | Percentage    | No. of People                  | Percentage    |                                                               |
| <b>Total</b>         | <b>1,103</b>                    | <b>100.0%</b> | <b>1,103</b>                   | <b>100.0%</b> |                                                               |
| <b>Age</b>           |                                 |               |                                |               |                                                               |
| Age 16-25            | 185                             | 16.8%         | 155                            | 14.1%         | 0.84                                                          |
| Age 26-35            | 199                             | 18.0%         | 176                            | 15.9%         | 0.88                                                          |
| Age 36-45            | 197                             | 17.9%         | 213                            | 19.3%         | 1.08                                                          |
| Age 46-55            | 194                             | 17.6%         | 195                            | 17.7%         | 1.01                                                          |
| Age 56-65            | 181                             | 16.4%         | 185                            | 16.7%         | 1.02                                                          |
| Age 66 and above     | 147                             | 13.3%         | 179                            | 16.2%         | 1.22                                                          |

## D. Research Limitations

To keep on top of how Taiwanese people use communications in the digital economic era, a survey on the Broadband Usage trends in the communications industry was implemented by means of interviews with people aged 16 and over (those who were born on and before December 31, 2004) in Taiwan proper (exclusive of Kinmen County and Lian jiang County), at the request of the NCC. However, the following study limitations exist when actually performing the survey:

### 1. Sample frame limitations

Based on the requirements of the NCC, at least 1,100 successful samples were to be completed with the allocation of samples proportional to the population of every county or city.

In order to undertake rigorous sampling, research was conducted with reference to the sample structure used in Taiwan Social Change Survey by Academia Sinica. Nonetheless, it may be worth noting that this research differed from the Taiwan Social Change Survey, where household registrations are used as a sampling frame. With no access to Taiwan's household registration database, a household survey seemed impossible. Instead, interviews were carried out at gathering places in townships or cities.

## **2. Sample recovery restrictions**

The survey questionnaires contained 83 questions. In order to meet the requirement of at least 1,100 successful sample responses, groups of two interviewers were arranged at busy locations, such as parks and crossroads, to perform interviews.

During this survey, the average number of those who did not comply was 7.74. Among the aged 55 and over groups, the average number of refusals was 10.95, making it much harder to achieve the planned number of interviews when compared with young people. Even so, the interviewers were urged to obtain the required number of samples by gender and age, so the weighted number of all age groups would not exceed the original number of samples by more than 60%.

## **3. Sample Inference Restrictions**

After weighting, the sample number of young people, such as ages 16-25, was 0.84 times greater; the sample number of ages 26-35 was 0.88 times greater; the sample number of ages 36-45 was 1.08 times greater; the sample number of middle-aged people such as ages 46-55 was 1.01 times greater; the sample number of ages 56-65 was 1.02 times greater; and the sample number of ages 66 and over was 1.22 times greater.

Non-probability sampling was employed in this research; therefore, care should be taken when using the resulting statistical inferences.

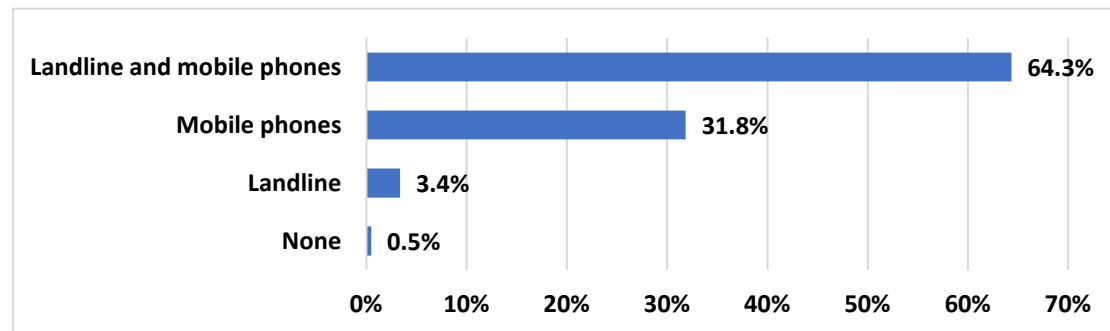
### III. Results

#### A. Phone Usage

##### Household Phone Usage Q7

###### 1. Overall analysis

For household phone usage, 64.3% of people in Taiwan aged 16 and over have both landline and mobile phones. With the ubiquity of mobile and broadband networks, 31.8% responded that they rely fully on mobile phones, while 3.4% people use only landline phones at home (see Figure 1).



Base: N=1,103, single-choice

**Figure 1 Household Phone Usage**

###### 2. Comparative analysis

###### (1) Analysis of regional differences

The cross analysis suggests that people in all regions have both landline and mobile phones, with the highest ratio of 79% in Kaohsiung, Pingtung and Penghu and the lowest ratio of 53% in Taipei City, New Taipei City and Keelung.

###### (2) Analysis of basic differences

When analyzed by gender, a majority of both men (62.8%) and women (65.8%) have both a landline and a mobile phone.

When analyzed by age, all age groups have the highest proportion of using both landlines and mobile phones, with the highest ratio of 73.2% of those aged 66 and over and the lowest ratio of 51.3% in people aged 26–35.

In addition, people aged 66 and over (7.9%) have the highest proportion of using only landlines, and people aged 26–35 (47.2%) have the highest proportion of using only mobile phones.

When analyzed by marital status, regardless of marital status the majority have both landlines and mobile phones, with the highest rate 69.2% of those married and the lowest rate 57.5% of those unmarried.

## The Monthly Phone Bill at Home Q8

### 1. Overall analysis

The average monthly phone bill at home for people in Taiwan aged 16 and over is NT\$397 (N = 747, people who use a landline).

### 2. Comparative analysis

#### (1) Analysis of regional differences

The cross analysis suggests that the average monthly telephone bill at home is over NT\$300 in all regions, with the highest average of NT\$454 in Yunlin, Chiayi and Tainan and the lowest NT\$302 in Taoyuan, Hsinchu and Miaoli (see Table 9).

**Table 9 The Monthly Phone Bill at Home (by Region)**

Unit : NTD

| Region                                   | Average Bill |
|------------------------------------------|--------------|
| Taipei City, New Taipei City and Keelung | 431          |
| Taoyuan, Hsinchu and Miaoli              | 302          |
| Taichung, Changhua and Nantou            | 413          |
| Yunlin, Chiayi and Tainan                | 454          |
| Kaohsiung, Pingtung and Penghu           | 372          |
| Yilan, Hualien and Taitung               | 368          |
| <b>Average</b>                           | <b>397</b>   |

Source: Results of this research

#### (2) Analysis of basic differences

When analyzed by gender, the average monthly landline bill at home is NT\$439 for men, which is higher than the average bill of NT\$364 for women.

When analyzed by age, the highest bill is NT\$595 for 16–25 year-olds, and the lowest bill is NT\$367 for 46–55 year-olds.

When analyzed by marital status, the highest bill is NT\$514 among those married, and the lowest bill is NT\$310 among those widowed or separated.

## The Satisfaction of the Communication Quality of Landline Q10

### 1. Overall analysis

The average score of the satisfaction with the quality of the communication quality of landline for people in Taiwan aged 16 and over is 7.81 (1-point is very dissatisfied, and 10 points is very satisfied; N=747, people who use a landline).

### 2. Comparative analysis

#### (1) Analysis of regional differences

The cross analysis suggests that average score for satisfaction in all regions is between 7–8 points except for Taipei City, New Taipei City and Keelung (8.37). Among the regions whose score is between 7–8, the lowest point is 7.24 in Taichung, Changhua

and Nantou (see Table 10).

**Table 10 The Satisfaction of the Communication Quality of Landline (by Region)**

| Region                                   | Average Score |
|------------------------------------------|---------------|
| Taipei City, New Taipei City and Keelung | 8.37          |
| Taoyuan, Hsinchu and Miaoli              | 7.89          |
| Taichung, Changhua and Nantou            | 7.24          |
| Yunlin, Chiayi and Tainan                | 7.55          |
| Kaohsiung, Pingtung and Penghu           | 7.75          |
| Yilan, Hualien and Taitung               | 7.75          |
| <b>Average</b>                           | <b>7.81</b>   |

Source: Results of this research

## (2) Analysis of basic differences

The results of the one-way ANOVA analysis indicates that the average score for satisfaction with the communication quality of landline significantly varies by age.

When analyzed by gender, the average satisfaction score for men using landline is 7.9 points, higher than the satisfaction score for women (7.72).

When analyzed by age, except for 36–45 year-olds (8.26), the average score for satisfaction with the communication quality of landline is between 7–8, with 16–25 having the lowest score of 7.24.

When analyzed by marital status, the highest score is 8.08 for those widowed or separated, and the lowest score is 7.63 for those unmarried.

## The Overall Satisfaction with the Landline Provider Q11

### 1. Overall analysis

The overall satisfaction with the landline providers for people in Taiwan aged 16 and over is 7.7 points on average (1-point is very dissatisfied, and 10-points is very satisfied; N=747, people who use a landline).

### 2. Comparative analysis

#### (1) Analysis of regional differences

When analyzed by region, except for Taipei City, New Taipei City and Keelung (8.38) with the average higher than 8, the satisfaction score is between 7–8, with the lowest point 7.06 in Taichung, Changhua and Nantou (see Table 11).

**Table 11 Satisfaction with the Landline Provider (by Region)**

| <b>Region</b>                            | <b>Average Score</b> |
|------------------------------------------|----------------------|
| Taipei City, New Taipei City and Keelung | 8.38                 |
| Taoyuan, Hsinchu and Miaoli              | 7.74                 |
| Taichung, Changhua and Nantou            | 7.06                 |
| Yunlin, Chiayi and Tainan                | 7.43                 |
| Kaohsiung, Pingtung and Penghu           | 7.58                 |
| Yilan, Hualien and Taitung               | 7.79                 |
| <b>Average</b>                           | <b>7.70</b>          |

Source: Results of this research

## **(2) Analysis of basic differences**

The results of the one-way ANOVA analysis indicate that overall satisfaction with a landline provider significantly varies by marital status.

When analyzed by gender, men have a higher score (7.75) than women (7.65).

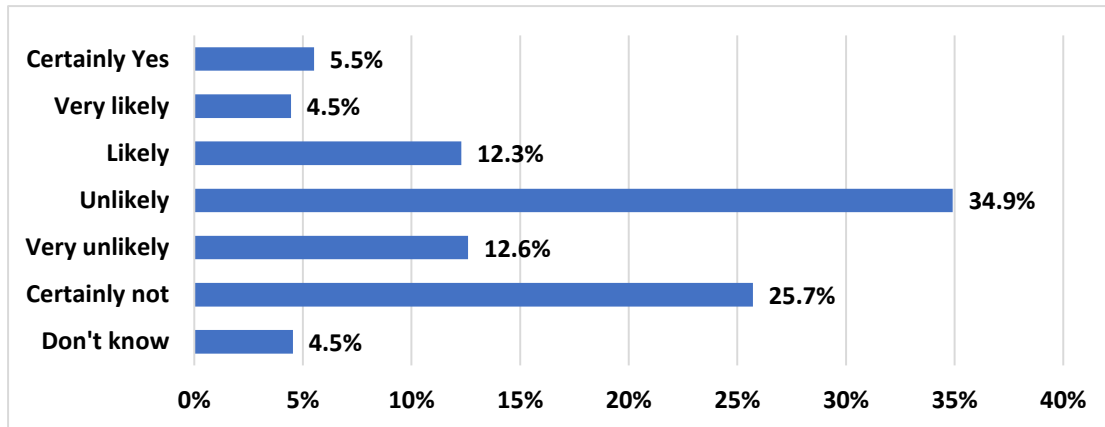
When analyzed by age, the overall satisfaction with a landline provider frequently decreases by age group, with the highest score 8 for people aged 36–45, and the lowest 6.94 for people aged 16–25.

When analyzed by marital status, the highest score is 7.83 of those married, and the lowest is 7.37 of those unmarried.

## **The Possibility of and Reasons for Installing a Landline at Home in the Next 12 Months Q12 Q13**

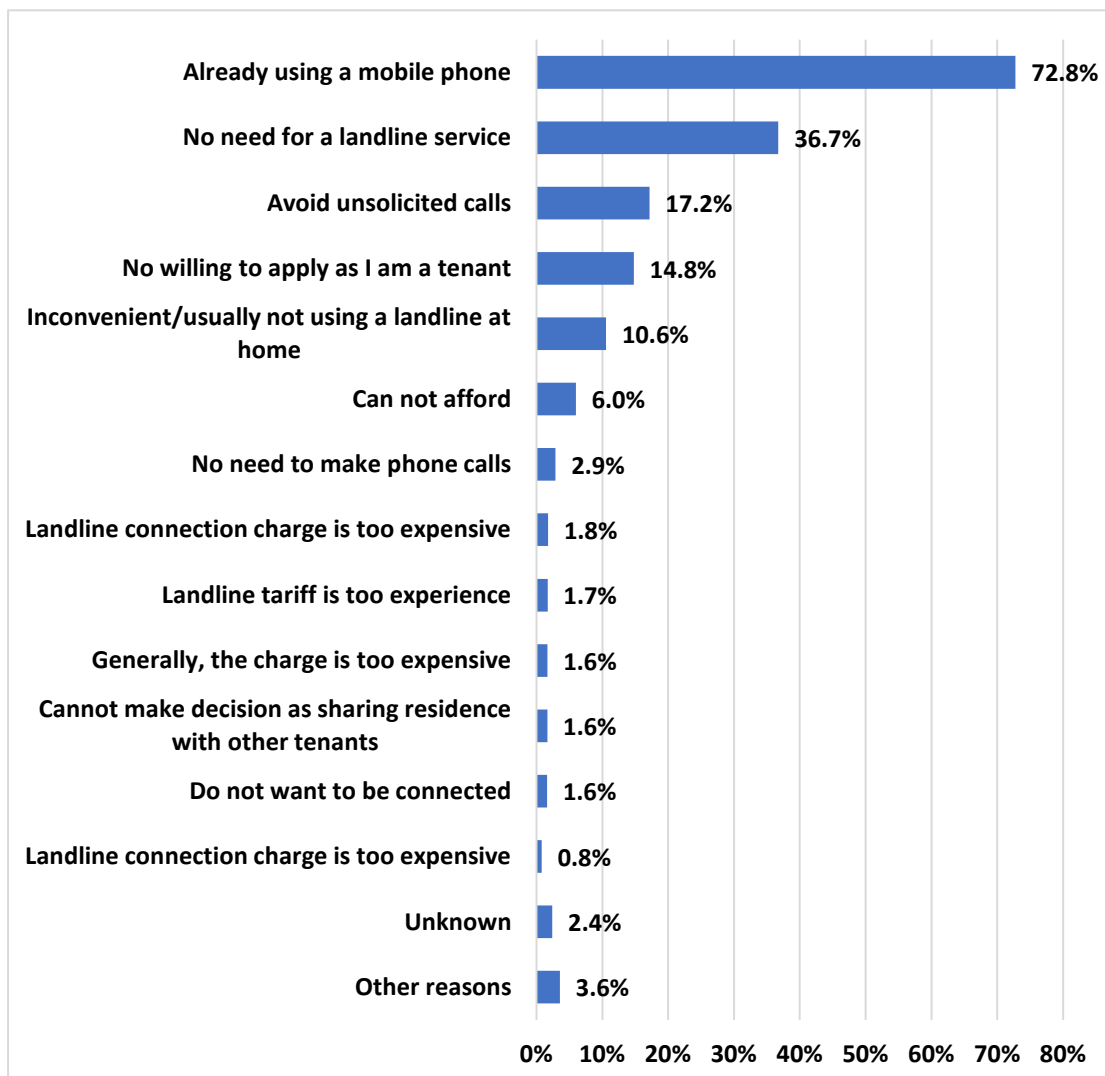
### **1. Overall analysis**

In the next 12 months, 22.3% (including certainly yes, very likely and likely) of the participants will be installing a landline at home. There are 73.2% (including certainly not, very unlikely and unlikely) of participants who have no plans to install a landline (see Figure 2). Among the reasons for not having a landline, already using a mobile phone is the most common answer (72.8%), followed by no need for a landline service (36.7%), and avoiding unsolicited calls (3.9%) (see Figure 3).



Base : N=356, single-choice (people who do not use landline at home)

**Figure 2 The Possibility of Installing a Landline at Home in the Next 12 Months**



Base : N=261, multiple-choice (people who do not use landline at home and have no plans to install a landline in the next 12 months)

**Figure 3 The Reasons for Not Installing a Local Phone Line at Home in the Next 12 Months (Top 10)**

## **2. Comparative analysis**

### **(1) Analysis of regional differences**

When analyzed by region, the majority of people who do not have a landline at home have no plans to install a landline in the next 12 months in all regions. Among them, the highest rate is 88% in Taoyuan, Hsinchu and Miaoli, and the lowest rate is 61.8% in Taipei City, New Taipei City and Keelung.

The highest rate for people who will be installing a landline is in Taipei City, New Taipei City and Keelung (35.5%), and the lowest rate is in Kaohsiung, Pingtung and Penghu (7.1%).

In terms of the reasons for not installing landline, people in all regions have the highest proportion for already using a mobile phone, with the highest rate 82.3% in Kaohsiung, Pingtung and Penghu, and the lowest rate 63.6% in Taichung, Changhua and Nantou.

### **(2) Analysis of basic differences**

When analyzed by gender, 75% of men and 71.3% of women do not plan to install a landline in the next 12 months. In terms of the reasons, 72% of men and 73.6% of women think mobile phones are an alternative.

When analyzed by age, a majority in all age groups do not plan to install a landline, with the highest 78.1% of 56–65 year-olds and the lowest rate 58.8% of people aged 66 and over.

In terms of the reasons, the majority of people think mobile phones are an alternative in all age groups, with the highest rate 86% among people aged 56–65, and the lowest rate 58.8% 56–65 among people 66 and over.

When analyzed by marital status, the highest rate of people who have no plans to install a landline is among those widowed or separated (81.9%), the lowest are those married (70.2%). In terms of the reasons, the highest rate of people (88.1%) who think that mobile phones can be an alternative are those married, while the lowest rate (71.2%) are those widowed or separated.

### **(3) Analysis of differences in social and economic status**

The result of Chi-square tests indicates that people who have no plans to install a landline at home in the next 12 months significantly varies by housing tenure.

When analyzed by housing tenure, both the majority of home owners (65.8%) and house renters (83.3%) have no plans to install a landline in the next 12 months.

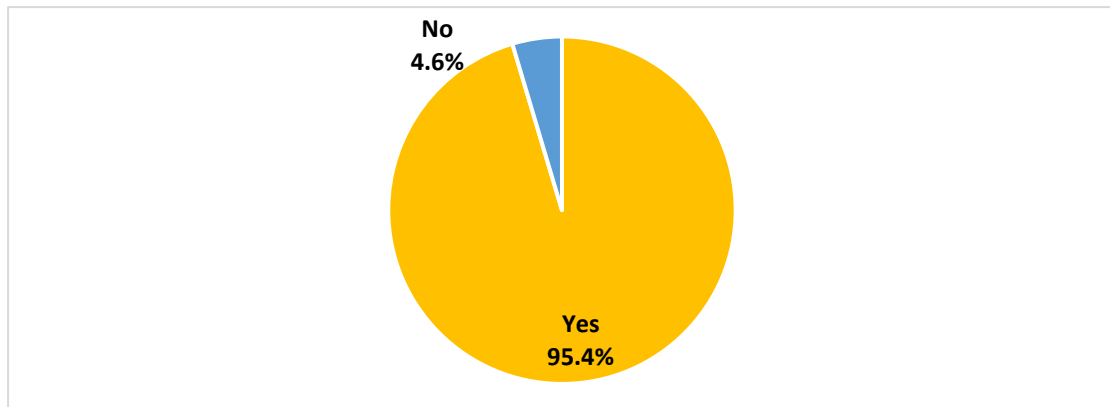
## **B. Mobile Phone Services**

### **Mobile Phone Usage Q17**

#### **1. Overall analysis**

The proportion of people who use mobile phones (including traditional mobile

phones and smartphones) is 95.4%, much higher than those who do not use mobile phones (4.6%) (see Figure 4).



Base : N=1,103, single-choice (people who use mobile phones)

**Figure 4 Smartphone Usage**

## **2. Comparative analysis**

### **(1) Analysis of regional differences**

The result of cross analysis indicates that over 90% of people use mobile phones in all regions, with the highest rate 97.6% in Taoyuan, Hsinchu and Miaoli, and the lowest rate 91.4% in Yilan, Hualien and Taitung.

### **(2) Analysis of basic differences**

The result of Chi-square tests indicates that whether people use mobile phones or not significantly varies by age and marital status.

When analyzed by gender, the majority of both men (95.3%) and women (95.5%) use mobile phones.

When analyzed by age, except for people aged 66 and over (81.4%), the percentage of those who use mobile phones by age group is over 90%, with the highest rate 99.4% of the people aged 26–35.

When analyzed by marital status, over 90% use a mobile phone regardless of marital status, with the highest rate 99% of those unmarried, and the lowest rate 91.2% of those widowed/separated.

### **(3) Analysis of differences in social and economic status**

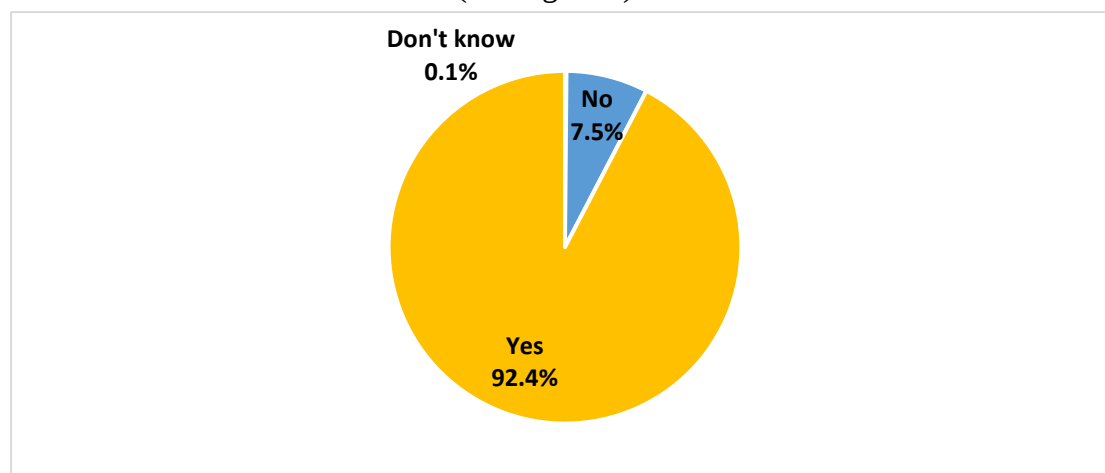
The result of Chi-square tests indicates that whether people use a mobile phone or not varies by housing tenure.

When analyzed by housing tenure, house renters (98%) have a higher rate of using a mobile phone than home owners (94.8%).

## **The Internet Connectivity of the Most Frequently Used Mobile Phone Q18**

### **1. Overall analysis**

The proportion of people whose most frequently used mobile phone can be connected to the Internet is 92.4% (see Figure 5).



Base : N=1,052, single-choice (people who use mobile phones)

**Figure 5 The Internet Connectivity of the Most Frequently Used Mobile Phone**

## 2. Comparative analysis

### (1) Analysis of regional differences

The cross analysis suggests that, except for participants in Taipei City, New Taipei City and Keelung (88.9%), the proportion of those who most frequently use mobile phones that can be connected to the Internet in each of the other regions is over 90%, with the highest rate 96% in Taichung, Changhua and Nantou.

### (2) Analysis of basic differences

When analyzed by gender, the proportion of women (92.9%) who most frequently use mobile phones that can be connected to the Internet is a little higher than men (91.8%).

When analyzed by age, the proportion of participants whose most frequently used mobile phone can be connected to the Internet decreases by age group. Except for people aged 56–65 (88.6%) and 66 and over (70.7%), the proportion who most frequently used mobile phones that can be connected to the Internet is over 90%, with the highest rate 100% of 26–35 year-olds.

When analyzed by marital status, only the proportion of those unmarried who most frequently used mobile phones that can be connected to the Internet is over 90%, while those widowed/separated have the lowest rate 87.4%.

### (3) Analysis of differences in social and economic status

The result of Chi-square tests indicates that the proportion of participants who most frequently use a mobile phone that can be connected to the Internet significantly varies by housing tenure, education level and individual average monthly income.

When analyzed by housing tenure, the proportion of house renters (98%) who most frequently use a mobile phone that can be connected to the Internet is higher than it is for home owners (91%).

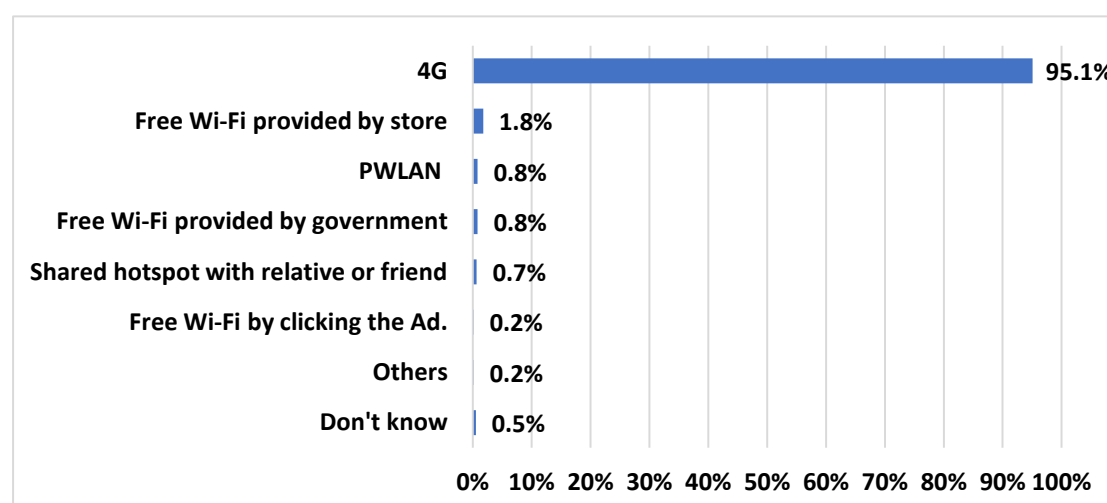
When analyzed by education level, the proportion of participants who most frequently use a mobile phone that can be connected to the Internet increases by education level, with the highest rate 99.4% of those with a bachelor's degree and the lowest rate 58.7% of those with elementary school or lower.

When analyzed by individual average monthly income, the 96.8% of those who earn NT30,000-NT39,999 who most frequently use a mobile phone that can be connected to the Internet is the highest proportion, and the 83.3% of those who earn NT10,000-NT19,999 is the lowest.

## The Most Frequently Used Mobile Internet Service Outside Homes Q20

### 3. Overall analysis

The most frequently used mobile Internet service for people outside of their homes is 4G, up to 95.1% (see Figure 6).



Base : N=946, single-choice (people whose most frequently used mobile phone can be connected to the Internet)

**Figure 6 Most Frequently Used Mobile Internet Service Outside Homes**

### 4. Comparative analysis

#### (4) Analysis of regional differences

The cross analysis suggests that 4G service users are the highest proportions in all regions, the highest is 98.7% in Yilan, Hualien and Taitung, the lowest is 91.8% in Yunlin, Chiayi and Tainan.

#### (5) Analysis of basic differences

When analyzed by gender, both men (93.9%) and women (96.2%) mainly use 4G services.

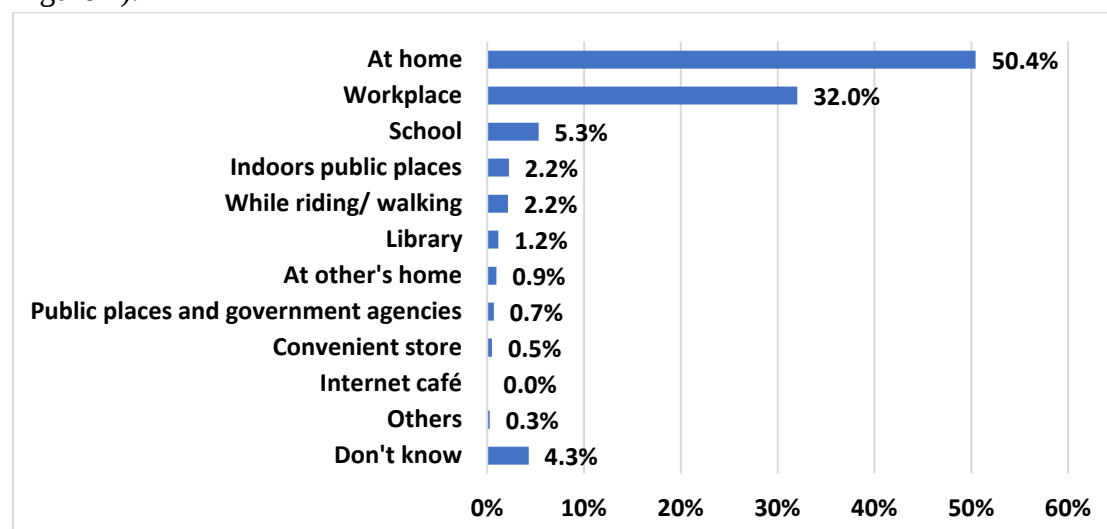
When analyzed by age, 4G service users have the highest proportions in all age groups, every age group is over 90%, with the highest rate 96.3% of people aged 66 and over and the lowest rate 93.2% of people aged 46–55.

When analyzed by marital status, 4G service users have the highest proportions regardless of marital status, with the highest rate 96.3% of those widowed/separated and the lowest rate 93.2% of those unmarried.

## The Most Common Place to Access Internet through Mobile Phones Q21

### 1. Overall analysis

The survey shows that most people in Taiwan and aged 16 and over use mobile phones to access the network at home (50.4%), followed by workplace (32%) (see Figure 7).



Base : N=962, single-choice (people whose most frequently used mobile phone can be connected to the Internet)

**Figure 7 The Most Commonly Used Mobile Phone Networking Sites**

### 2. Comparative analysis

#### (1) Analysis of regional differences

The cross analysis suggests that using mobile phones to access the Internet at home has a higher proportion in all regions, with 56.7% in Taichung, Changhua and Nantou being the highest and 43.4% in Yunlin, Chiayi and Tainan the lowest.

#### (2) Analysis of basic differences

When analyzed by gender, homes are the most common places used to access the Internet by mobile phone for 46.5% of men and 54.2% of women.

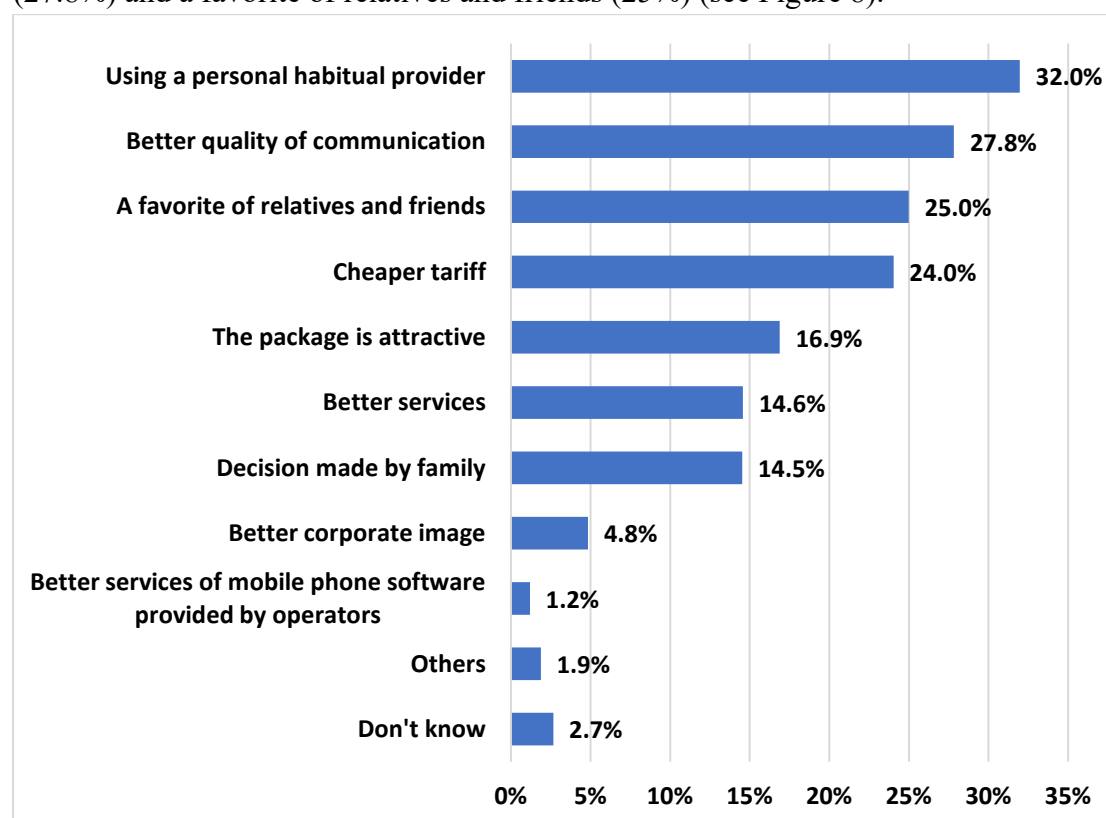
When analyzed by age, 41.8% of the 26–35 year-olds and 43.2% of the 36–45 year-olds access the Internet at workplaces, while for the other age groups, homes are the most common place to access the Internet by mobile phone, with the highest rate 80.9% of those 66 and over.

Regardless of marital status, homes are the most frequent place to access the Internet by mobile phones, with the highest rate 67.8% of those widowed/separated and the lowest rate 40.2% of those unmarried.

## The Reasons for choosing the Telecoms Operators Q26

### 1. Overall analysis

Using a personal habitual provider is the most common reason for choosing a telecoms service provider for 32%, followed by better quality of communication (27.8%) and a favorite of relatives and friends (25%) (see Figure 8).



Base : N=1,045, multiple-choice (people who use traditional mobile phones/smartphones and whose telecoms suppliers are known)

**Figure 8 The Reasons to Choose the Telecoms Suppliers**

### 2. Comparative analysis

#### (1) Analysis of regional differences

The cross analysis suggests that using a personal habitual provider is the top reason for choosing a telecoms service provider in Taipei City, New Taipei City, and Keelung (38.1%); Taoyuan, Hsinchu, Miaoli (33.4%); Yilan, Hualien and Taitung (47.3%).

In Taichung, Changhua, Nantou (33.4%) and Yunlin, Chiayi and Tainan (34.3%), better communication quality of the provider is the top reason. Being a favorite provider of relatives or friends is the top reason in Kaohsiung, Pingtung and Penghu (35.8%).

#### (2) Analysis of basic differences

When analyzed by gender, 35.1% of men and 28.9% of women are the highest rates for choosing a service provider because of using a personal habitual provider.

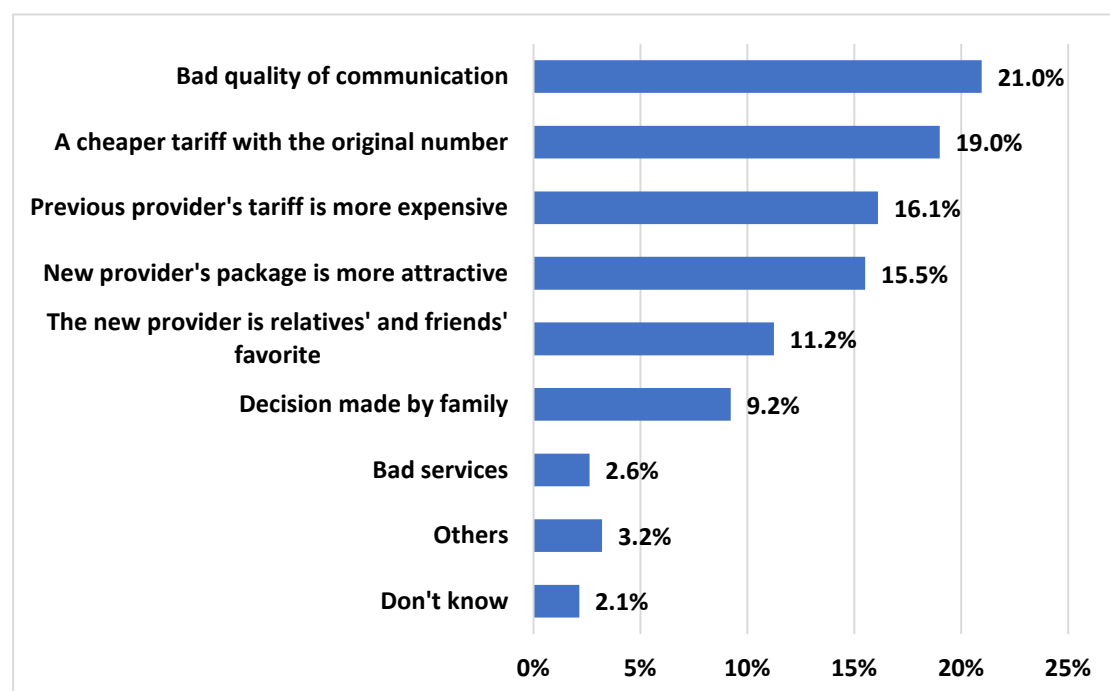
When analyzed by age, people aged 46–55 (35.7%), 56–65 (38.2%) and 66 and over (41.1%) have the highest proportions for choosing a telecoms service provider because of using a personal habitual provider. Participants of the other age groups have different reasons for choosing a provider, with the highest rate 40.8% of 16–25 year-olds because of a decision made by family. Better communication quality of the provider is the top reason for 26–35 year-olds (35.4%). Choosing a service provider because it is a favorite provider of relatives or friends is the highest rate for 36–45 year-olds (31%).

When analyzed by marital status, people of each marital status have different reasons for choosing a telecoms services provider. The majority of unmarried people have the highest rate 28.9% for better communication quality of the provider. Using a personal habitual provider is the main reason for those married (35.7%), and a cheaper tariff for those widowed/separated (31.1%).

## The Main Reasons to Change the Habitual Telecoms Operators Q29

### 1. Overall analysis

Bad quality of communication is the most common reason for changing telecoms service provider for 21%, followed by a cheaper tariff with the original number (19%), and the previous provider's tariff being more expensive (16.1%) (see Figure 9).



Base : N=446, single-choice (people who use traditional mobile phones/smartphones and whose telecoms suppliers are known and have been changed)

**Figure 9 The Main Reasons to Change the Habitual Telecoms Suppliers**

## **2. Comparative analysis**

### **(1) Analysis of regional differences**

The cross analysis suggests that the top reason for changing provider differs from region to region. Bad quality of communication is the top reason for the majority of people in Taoyuan, Hsinchu and Miaoli (28.6%) and Yilan, Hualien and Taitung (26.2%). In Taipei City, New Taipei City, and Keelung (25.1%) and Yunlin, Chiayi and Tainan (24.4%), it is for a cheaper tariff with the original number. The new provider's package is more attractive is the top reason in Taichung, Changhua and Nantou (22.3%), while that the new provider is a relatives' or friends' favorite is the top reason in Kaohsiung, Pingtung and Penghu (20.6%).

### **(2) Analysis of basic differences**

When analyzed by gender, for 23.7% of men, poor communication quality is the top reason; for 20.5% of women, a cheaper tariff with the previous number is the highest rate.

When analyzed by age, the top reason for changing provider for 16–25-year-olds (24.5%) is because of a decision made by family, while for 26–35-year-olds (28.8%) and 46–55-year-olds (21.5%) it is because the tariff is cheaper with the original number. Poor communication quality of the previous provider is the top reason for 36–45-year-olds (24.3%) and 56–65-year-olds (25.7%), while for people aged 66 and over (31.2%) it is because the previous provider's tariff is more expensive.

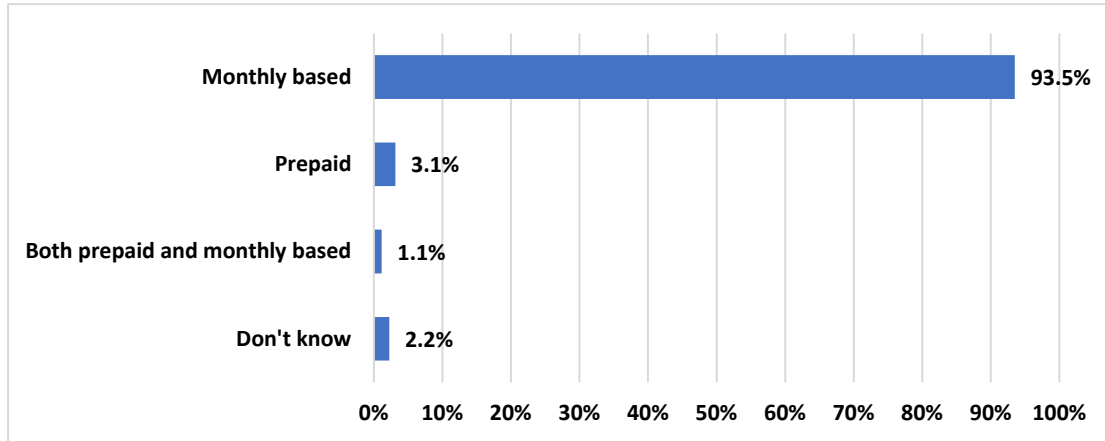
When analyzed by marital status, bad quality of communication has the highest rate of those unmarried (23.6%) and those widowed/separated (25.5%), while a cheaper tariff with the original number has the highest rate 20.2% for those married.

## **C. Mobile Phone Plans**

### **Most Common Mobile Phone Tariff Plans and Types Q31**

#### **1. Overall analysis**

The most commonly used mobile phone tariff plans and types are monthly based (93.5%), followed by prepaid (3.1%) and both (1.1%) (see Figure 10).



Base : N=1,052, single-choice (people who use traditional mobile phones or smartphones)

**Figure 10 Most Common Mobile Phone Tariff Plans**

## **2. Comparative analysis**

### **(1) Analysis of regional differences**

The cross analysis suggested that more than 90% of people in all regions use a monthly paid mobile phone tariff plan. Among all regions, people in Yilan, Hualien and Taitung have the highest rate of 97.8% while people in Taoyuan, Hsinchu and Miaoli the lowest of 92.5%.

### **(2) Analysis of basic differences**

When analyzed by gender, 94.1% of women and 92.8% of men mostly use a monthly paid mobile phone tariff plan.

When analyzed by age, over 90% of all age groups use a monthly paid mobile phone tariff plan. Among them, people aged 26–35 have the highest rate of 95.7% and 16–25-year-olds the lowest, 90.2%.

When analyzed by marital status, all people mostly use a monthly paid mobile phone tariff plan regardless of marital status. Among them, those married have the highest rate (94.3%) while those widowed/separated have the lowest rate (91.7%).

## **Monthly Mobile Phone Bill Q34**

### **1. Overall analysis**

The average monthly cost of a mobile phone bill is NT\$727 (N = 996, people who use traditional mobile phones/smartphones and monthly-based plan).

### **2. Comparative analysis**

#### **(1) Analysis of regional differences**

Cross analysis suggests that, except for a higher average monthly mobile phone bill in Yunlin, Chiayi and Tainan (NT\$991), the average bills are between NT\$600–800. Among them, the highest average bill is NT\$745 in Taoyuan, Hsinchu and Miaoli and the lowest NT\$623 in Kaohsiung, Pingtung and Penghu (see Table 12).

**Table 12 Monthly Mobile Phone Bill (By Region)**

Unit : NTD

| Region                                   | Average Bill |
|------------------------------------------|--------------|
| Taipei City, New Taipei City and Keelung | 677          |
| Taoyuan, Hsinchu and Miaoli              | 745          |
| Taichung, Changhua and Nantou            | 713          |
| Yunlin, Chiayi and Tainan                | 991          |
| Kaohsiung, Pingtung and Penghu           | 623          |
| Yilan, Hualien and Taitung               | 727          |
| <b>Average Score</b>                     | <b>727</b>   |

Source: Results of this research

**(2) Analysis of basic differences**

The results of the one-way ANOVA analysis indicates that the average monthly cost of a mobile phone bill significantly varies by gender and age.

When analyzed by gender, the monthly bills of men (NT\$766) are higher than those of women (NT\$680).

When analyzed by age, except for 56-65-year-olds (NT\$642) and 66-year-olds and over (NT\$534), monthly bills are over NT\$700 for all age groups with the highest average monthly mobile phone bills (NT\$826) among 32–35 -year-olds.

When analyzed by marital status, those widowed/separated have the highest average monthly mobile phone bills of NT\$827, and those married have the lowest bills of NT\$669.

**(3) Analysis of differences in social and economic status**

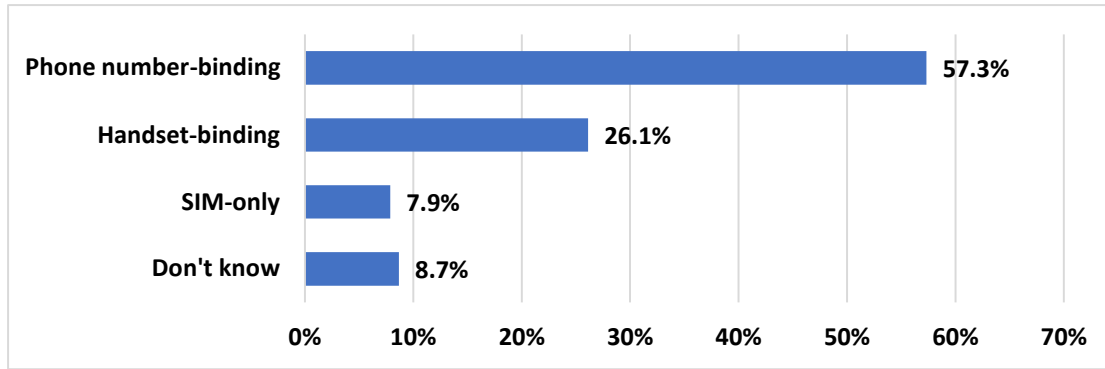
The results of the one-way ANOVA analysis indicate that the average monthly cost of a mobile phone bill significantly varies by housing tenure and education level.

When analyzed by housing tenure, house renters (NT\$800) have a higher average monthly mobile phone bills than home owners (NT\$690).

When analyzed by education level, those with senior high and vocational school education have the highest average monthly mobile phone bills (NT\$821), and those with elementary school education or lower have the lowest bills (NT\$466).

**Mobile Phone Plans Q36****1. Overall analysis**

People in Taiwan mainly opt for mobile phone plans with a phone number-binding contract (57.3%) or handset-binding contract (26.1%). Only 7.9% of people opt for a SIM-only plan (see Figure 11).



Base : N=1,029, single-choice (people who use traditional mobile phones/smartphones and know which phone plan they choose)

**Figure 11 Mobile Phone Plans Chosen**

## **2. Comparative analysis**

### **(1) Analysis of regional differences**

The result of Chi-square tests indicates that the mobile phone plans chosen significantly varies by regions.

The cross analysis suggests that the phone number-binding contract has a higher rate in all regions, with the highest rate 70.8% in Kaohsiung, Pingtung and Penghu and the lowest rate 49.5% in Taipei City, New Taipei City and Keelung.

### **(2) Analysis of basic differences**

The result of Chi-square tests indicates that the mobile phone plan chosen significantly varies by gender, age and marital status.

When analyzed by gender, 60.1% of women and 54.4% of men mainly choose the phone number-binding contract.

When analyzed by age, the phone number-binding contract plan has the higher rate for all age groups. Among them, the highest rate (62%) is for 26–35-year-olds, and the lowest rate (47.4%) among those aged 56–65.

When analyzed by marital status, a phone number-binding contract is the most frequent choice regardless of marital status, with the highest rate 64.6% of those unmarried and the lowest rate 53% of those married.

### **(3) Analysis of differences in social and economic status**

The result of Chi-square tests indicates that the type of mobile phone plan chosen significantly varies by education level and profession.

When analyzed by education level, the rate of choosing a phone number-binding contract is the highest for all education levels, with the highest rate 65.7% of those with a bachelor's degree, and the lowest rate 40.9% of those with high school and secondary education.

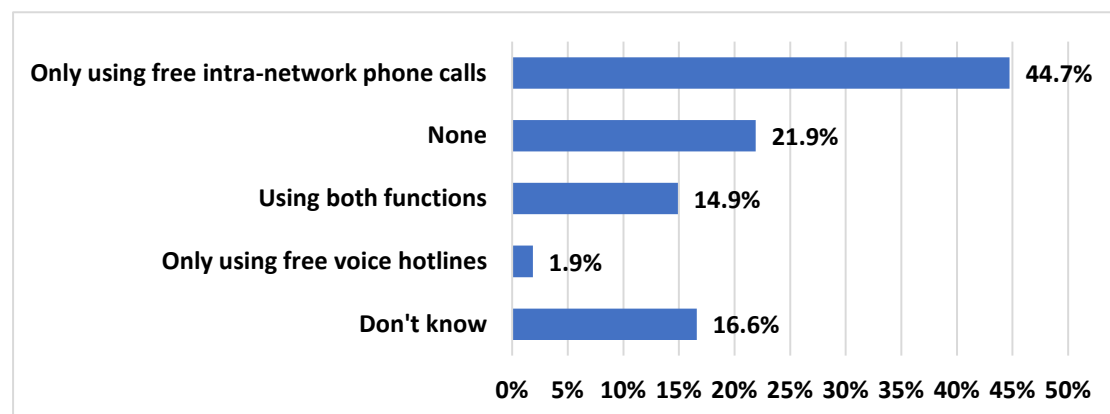
When analyzed by profession, except for people in the construction industry (45.6%) as well as transportation and warehousing industries (45.2%) which have the highest rate of opting for handset-binding contract, choosing for a phone number-

binding contract has the highest proportion, with the highest rate of 76.9% of those in the public administration and national defense industries and the lowest rate of 44.9% among those retired. The results of people in the electricity and gas supply industries was not analyzed due to the small sample size (less than 5).

## **The Usage of Free Voice Hotline and Intra-Network Phone Calls Q40**

### **1. Overall analysis**

In terms of the usage of free voice hotline and free intra-network, 44.7% only use a free intra-network, 1.9% only use free voice hotlines, 14.9% use both functions, and 21.9% use neither of these functions (see Figure 12).



Base : N=1,029, single-choice (people who use traditional mobile phones/smartphones and know which phone plan they choose)

**Figure 12 The Usage of Free Voice Hotline and Intra-Network Phone Calls**

### **2. Comparative analysis**

#### **(1) Analysis of regional differences**

When analyzed by region, only using free intra-network phone calls is the highest proportion in every region, with the highest rate 51.1% in Yilan, Hualien and Taitung, and the lowest rate 39.1% in Taipei City, New Taipei City and Keelung.

#### **(2) Analysis of basic differences**

When analyzed by gender, the highest proportion for both men (42.8%) and women (46.6%) is for only using free intra-network calls.

When analyzed by age, except for those aged 66 and over (43.2%) who have the highest rate for using neither of both functions, the highest rates by age is for only using free intra-network calls, with the highest rate 52.4% for those aged 36–45 and the lowest rate of 42% for those aged 26–35.

When analyzed by marital status, the highest proportions only use free intra-network calls regardless of marital status, with the highest rate 49.9% of those widowed/separated and the lowest rate of 42.5% among those married.

#### **(3) Analysis of differences in social and economic status**

The result of Chi-square tests indicates that the use of free voice hotlines and free

intra-network calls significantly varies by education level.

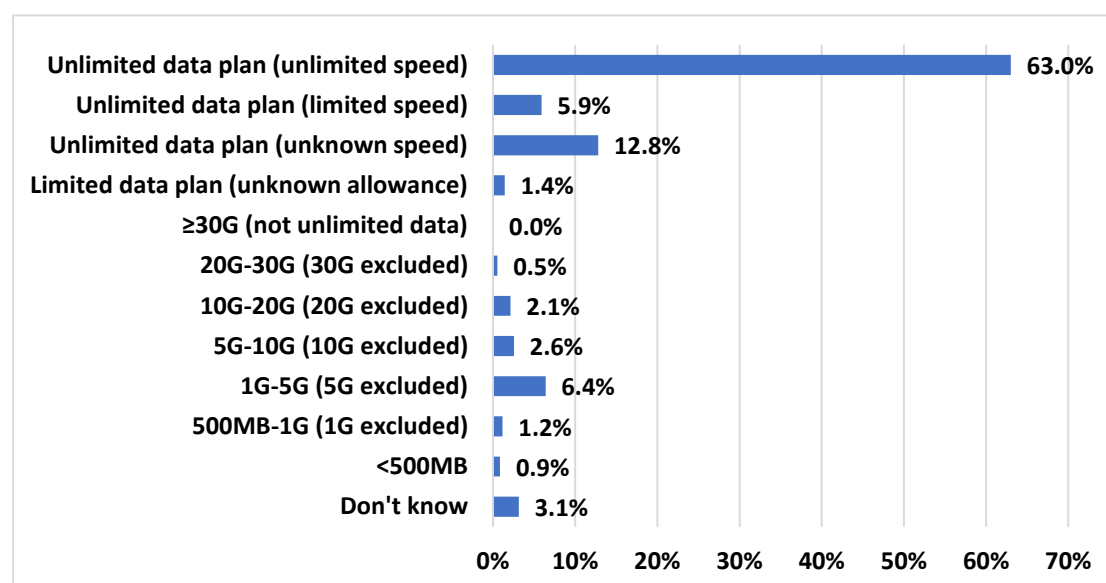
When analyzed by education level, except for those with elementary school education or lower (37.5%) who have the highest proportion for not using both functions, those of the other education levels have the highest rates of only using free intra-network calls, with the highest rate 48% for those with senior high and vocational school education and the lowest rate 39.7% of among those with a master's degree or higher.

## D. Mobile Broadband Data Allowance

### Mobile Broadband Data Allowance Q43

#### 1. Overall analysis

Consumers in Taiwan take great advantage of serious competition in unlimited data plans between telecom operators. The unlimited data plan (unlimited speed) has the highest rate of use (63%), followed by the unlimited data plan (unknown speed) (12.8%), and unlimited data plan (limited speed) (5.9%). As for limited data plans, the majority of participants choose the 5G–10G (5G excluded) plan (6.4%) (see Figure 13).



Base : N=886 (people who use traditional mobile phones/smartphones and the Internet-accessible project)

**Figure 13 Mobile Broadband Data Allowance**

#### 2. Comparative analysis

##### (1) Analysis of regional differences

The cross analysis suggests that the unlimited data plan (unlimited speed) has the highest rate in all regions, with the highest rate 77.6% in Taoyuan, Hsinchu and Miaoli and the lowest rate 49% in Taichung, Changhua and Nantou.

##### (2) Analysis of basic differences

When analyzed by gender, the majority of men (65.3%) and women (60.8%) have unlimited data plans (unlimited speed).

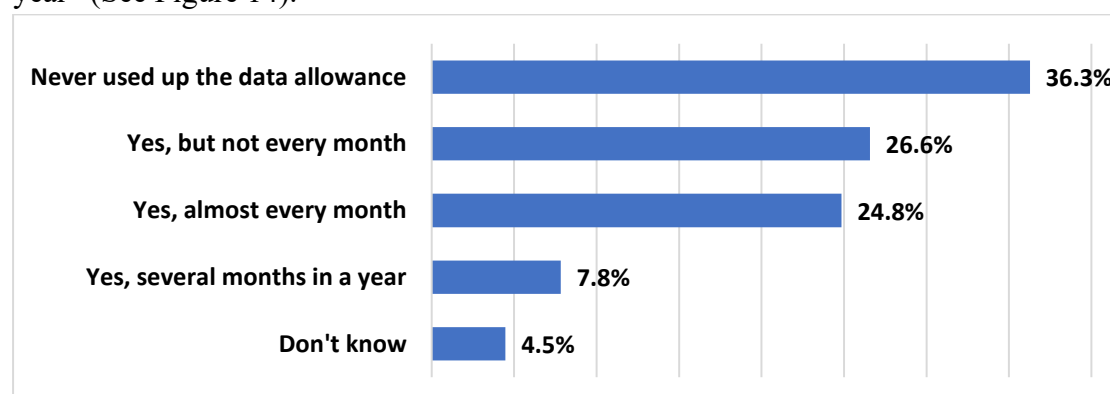
When analyzed by age, all age groups have the highest proportions for unlimited data plans (unlimited speed), with the highest rate 70.2% of 36–45-year-olds and the lowest rate 44.1% of 56–65-year-olds. In addition, the highest proportion that choose unlimited data plan (limited speed) are aged 56–65.

When analyzed by marital status, the highest proportion regardless of marital status is for unlimited data plans (unlimited speed), with the highest rate 68.5% of those unmarried and the lowest rate 58.6% of those married.

## Have You Ever Used Up Your Data Allowance Q44

### 1. Overall analysis

Up to 36.3% of those surveyed with a limited mobile data plan on their traditional mobile phones or smartphones chose the answer “Never used up the data allowance,” followed by those with the answer “Yes, but not every month” (26.6%), with 24.8% replying “Yes, almost every month” and 7.8% responding “Yes, several months in a year” (See Figure 14).



Base: N=134, single-choice (Those with a limited mobile data plan on their smart phones or traditional cell phone)

**Figure 14 Have You Ever Used Up Your Data Allowance**

### 2. Comparative analysis

#### (1) Analysis of regional differences

The cross analysis suggests that mobile data usage varies from area to area. Most of the interviewees from Taipei City, New Taipei City and Keelung (41%), Taoyuan, Hsinchu, Miaoli (55.1%) and Yunlin, Chiayi, Tainan (50.4%) answered “Never used up the data allowance,” while the largest share of interviewees from Kaohsiung, Pingtung, Penghu (38.2%) and Taichung, Changhua, Nantou (36.5%) chose the answer “Yes, but not every month.” The results of people in Yilan, Hualien and Taitung are not analyzed due to small sample size (less than 5).

## **(2) Analysis of basic differences**

When analyzed by gender, the largest share of men (31.3%) answered “Yes, but not every month;” while the highest proportion of women (41.5%) replied “Never used up the data allowance.” In addition, the female interviewees have a slightly higher proportion (26%) to answer “Yes, almost every month” than their male counterparts (23.2%).

When analyzed by age, mobile data usage varies with seniority. Those answering “Never used up the data allowance” make up the largest portion of people aged 16–25 (37.4%), 46–55 (44.4%), and 56–65 (47.8%); those answering “Yes, but not every month” account for the largest share of people aged 26–35 (37.9%) and 66 and over (54.2%); while those selecting “Yes, almost every month” constitute the highest percentage of the interviewees aged 36–45 (31.9%).

When analyzed by marital status, those selecting “Yes, almost every month” make up the largest portion of the unmarried interviewees (30.6%); while those answering “Never used up the data allowance” account for the largest share of those married (42.9%) and those widowed/separated (40.6%).

## **Satisfaction with the Quality of Mobile Phone Voice Q45**

### **1. Overall analysis**

The average score for satisfaction with mobile phone voice quality is 7.49 (1- point is very dissatisfied, and 10-points is very satisfied) (N=895, people who use traditional mobile phones/smartphones which include voice services).

### **2. Comparative analysis**

#### **(1) Analysis of regional differences**

The results of the one-way ANOVA analysis indicates that average satisfaction with the quality of mobile phone voice significantly varies by regions.

The cross test suggests that, except for Taichung, Changhua and Nantou (6.87), the average satisfaction rates for mobile phone voice quality by region are higher than 7. Among them, people in Yilan, Hualien and Taitung have the highest score (7.99) (see Table 13).

**Table 13 Satisfaction with the Quality of Mobile Phone Voice Quality (By Region)**

| <b>Region</b>                            | <b>Average Score</b> |
|------------------------------------------|----------------------|
| Taipei City, New Taipei City and Keelung | 7.70                 |
| Taoyuan, Hsinchu and Miaoli              | 7.76                 |
| Taichung, Changhua and Nantou            | 6.87                 |
| Yunlin, Chiayi and Tainan                | 7.08                 |
| Kaohsiung, Pingtung and Penghu           | 7.73                 |
| Yilan, Hualien and Taitung               | 7.99                 |
| <b>Average Score</b>                     | <b>7.49</b>          |

Source: Results of this research

## **(2) Analysis of basic differences**

When analyzed by gender, the satisfaction of men with mobile phone voice quality is 7.59 on average, and for women, the average score is 7.4.

When analyzed by age, the average satisfaction rates for mobile phone voice quality is higher than 7 for all age groups. Among them, 36–45-year-olds have the highest score (7.73) and people aged 16–25 have the lowest score (7.21).

When analyzed by marital status, average satisfaction rates for mobile phone voice quality are higher than 7 regardless of marital status, with the highest score (7.61) for those unmarried and the lowest score (7.39) for those widowed/separated.

## **Satisfaction with the Quality of Access to the Internet by Mobile Phone Q46**

### **1. Overall analysis**

The average level of satisfaction with the quality of access to the Internet by mobile phone is 7.25 (1-point is not satisfied, 10-points is very satisfied) (N=886, people who use traditional mobile phones and smartphones which include Internet services).

### **2. Comparative analysis**

#### **(1) Analysis of regional differences**

The results of the one-way ANOVA analysis indicates that average satisfaction with the quality of access to the Internet by mobile phone significantly varies by region.

The cross analysis suggests that, except for Taichung, Changhua and Nantou (6.71) and Yunlin, Chiayi and Tainan (6.95), the scores for satisfaction with the quality of access to the Internet by mobile phone are higher than 7. Among them, satisfaction in Yilan, Hualien and Taitung is at the highest (7.74) and Taoyuan, Hsinchu and Miaoli at the lowest (7.3) (see Table 14).

**Table 14 Satisfaction with the Quality of Accessing the Internet by Mobile Phone (By Region)**

| Region                                   | Average Score |
|------------------------------------------|---------------|
| Taipei City, New Taipei City and Keelung | 7.55          |
| Taoyuan, Hsinchu and Miaoli              | 7.30          |
| Taichung, Changhua and Nantou            | 6.71          |
| Yunlin, Chiayi and Tainan                | 6.95          |
| Kaohsiung, Pingtung and Penghu           | 7.39          |
| Yilan, Hualien and Taitung               | 7.74          |
| <b>Average Score</b>                     | <b>7.25</b>   |

Source: Results of this research

## (2) Analysis of basic differences

When analyzed by gender, men have an average score of satisfaction with the quality of access to the Internet by mobile phone of 7.25, which is slightly higher than the average of women (7.24).

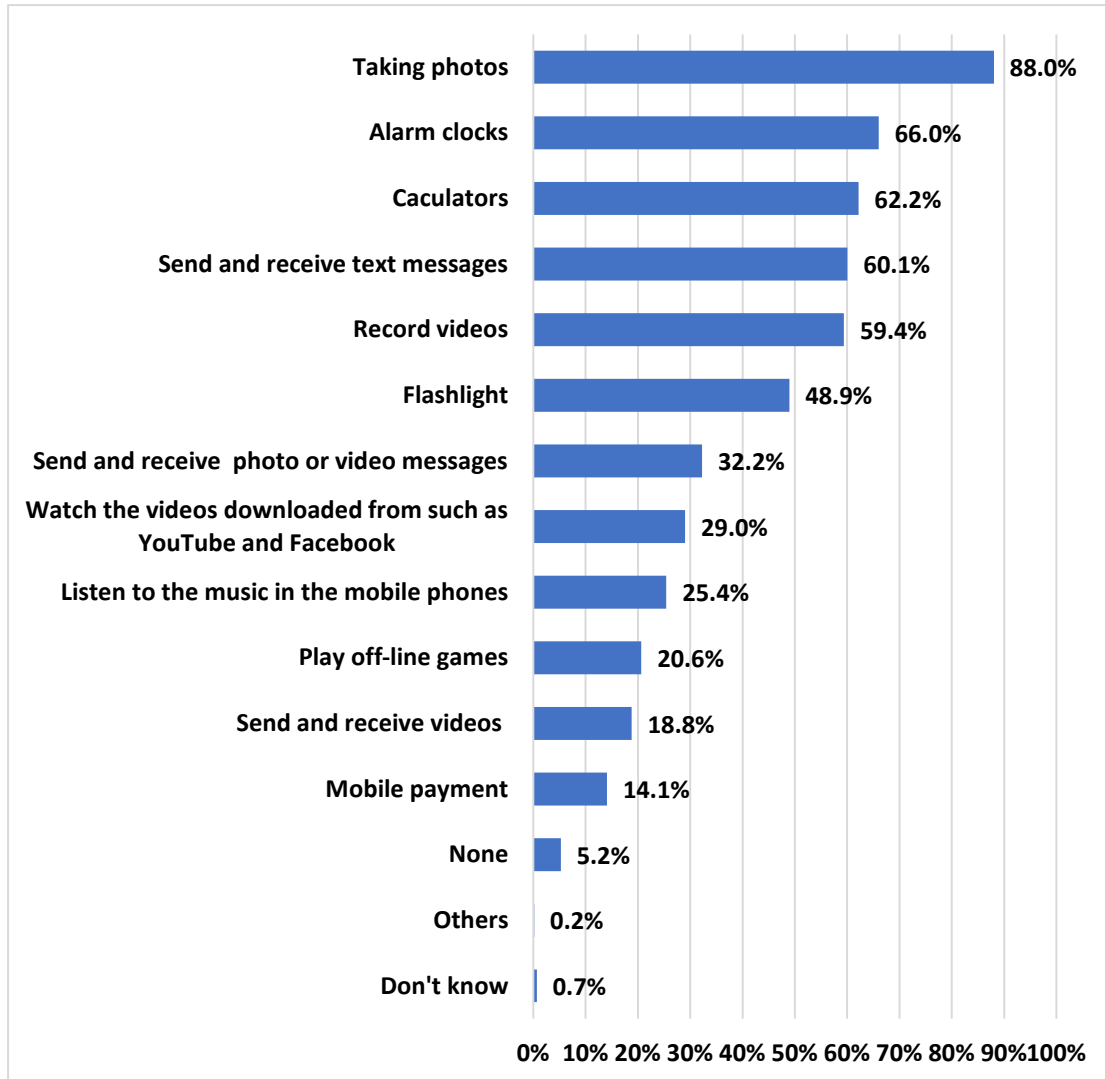
When analyzed by age, except for people aged 16–25 (6.9), the average satisfaction with the quality of access to the Internet by mobile phone is higher than 7. Among them, 36–45-year-olds have the highest score (7.56), and 56–65-year-olds have the lowest scores (7).

When analyzed by marital status, average satisfaction with the quality of access to the Internet by mobile phone is higher than 7 regardless of marital status. Among them, the widowed/separated have the highest scores (7.37), and those unmarried have the lowest scores (7.12).

## **Behaviors Related to Non-Internet Mobile Use beyond Phone Calls Q51**

### **1. Overall analysis**

In terms of the behaviors of non-Internet mobile use beyond phone calls, the highest rate of these behaviors is taking photos (88%), followed by using them as alarm clocks (66%) and calculators (62.2%) (see Figure 15).



Base : N=1,052, multiple-choice (people who use smartphones or traditional mobile phones)

**Figure 15 Behaviors of Non-Internet Mobile Use**

## 2. Comparative analysis

### (1) Analysis of regional differences

The cross analysis suggests that interviewees in all regions make up the highest proportion for taking photos, with the highest rate 89.4% in Kaohsiung, Pingtung and Penghu and the lowest rate 86.9% in Taipei City, New Taipei City and Keelung.

### (2) Analysis of basic differences

When analyzed by gender, 91.7% of women and 84.2% of men use mobile phones to take photos.

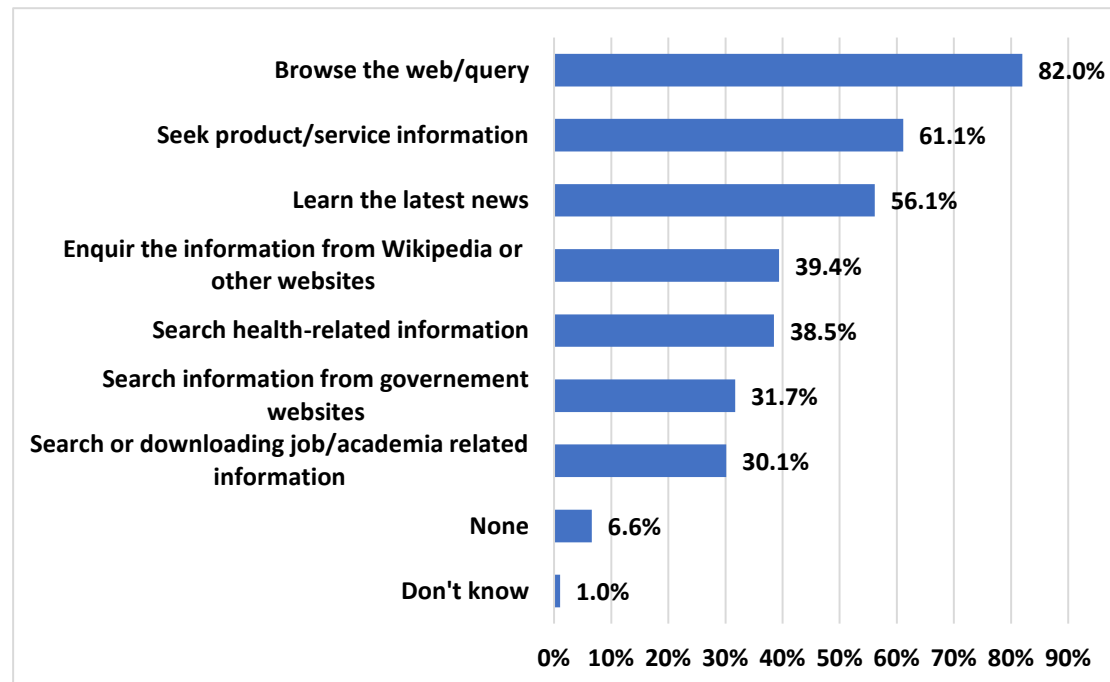
When analyzed by age, a majority in all age groups take photos, with the highest rate 94.6% of 36–45-year-olds and the lowest rate 73.5% of people aged 66 and over.

When analyzed by marital status, a majority take photos regardless of marital status, with the highest rate 90.1% of those unmarried and the lowest rate 86.3% of those widowed/separated.

## Searching Information over the Internet by Phone Users beyond Phone Calls Q52

### 1. Overall analysis

In terms of the behaviors of phone users beyond phone calls, 82% browse the web/query, followed by 61.1% who seek product/service information and 56.1% who learn the latest news (see Figure 16).



Base : N=962, multiple-choice (people who use the Internet and whose mostly used mobile phones can be accessed to the Internet)

**Figure 16 Searching Information over the Internet**

### 2. Comparative analysis

#### (1) Analysis of regional differences

The cross analysis suggests that, beyond phone calls, browsing the web/query is at the highest rate for all regions. The highest rate is in Taoyuan, Hsinchu and Miaoli (93.2%) and the lowest rate is in Taichung, Changhua, and Nantou (74.3%).

#### (2) Analysis of basic differences

When analyzed by gender, the majority of men (80%) and women (83.9%) browse the web/query.

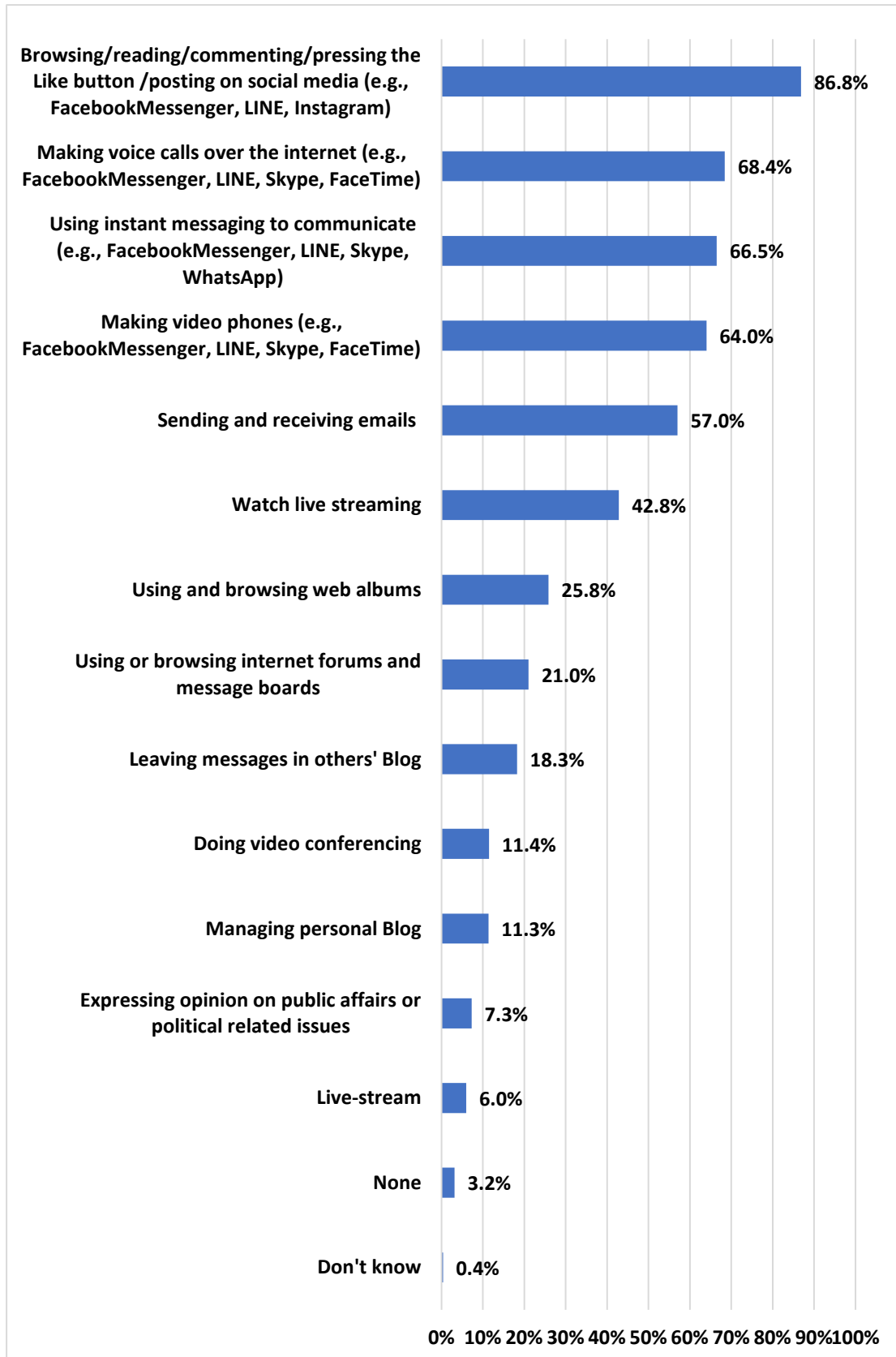
When analyzed by age, a majority in all age groups have the highest proportion for browsing the web/query, with the highest rate 92.3% of 26–35-year-olds and the lowest rate 56.2% of those aged 66 and over.

When analyzed by marital status, regardless of marital status a majority browse the web/query, with the highest rate 87.9% of those unmarried and the lowest rate 70.1% of those widowed/separated.

## **Behaviors around Socializing or Communicating functions of Phone through Internet Q53**

### **1. Overall analysis**

Beyond phone calls, browsing/reading/commenting/pressing the Like button /posting on social media are most popular (86.8%) for socializing and communicating functions which people use by phone through Internet, followed by making voice calls over the Internet (68.4%), and using instant messaging to communicate (66.5%) (see Figure 17).



Base : N=962, multiple-choice (people who use the Internet and whose mostly used mobile phones can be accessed to the Internet)

**Figure 17 Socializing or Communicating using Phone Internet functions**

## **2. Comparative analysis**

### **(1) Analysis of regional differences**

The cross analysis suggests that those who are browsing/reading/commenting /pressing the Like button/posting on social media make up the largest proportion of behaviors around the socializing or communicating functions of phones over the Internet in all regions, with the highest rate 92.6% in Kaohsiung, Pingtung and Penghu and the lowest rate 80.3% in Taichung, Changhua and Nantou.

### **(2) Analysis of basic differences**

When analyzed by gender, both men (85.5%) and women (88.2%) have the highest proportions for browsing/reading/commenting/pressing the Like button/posting on social media.

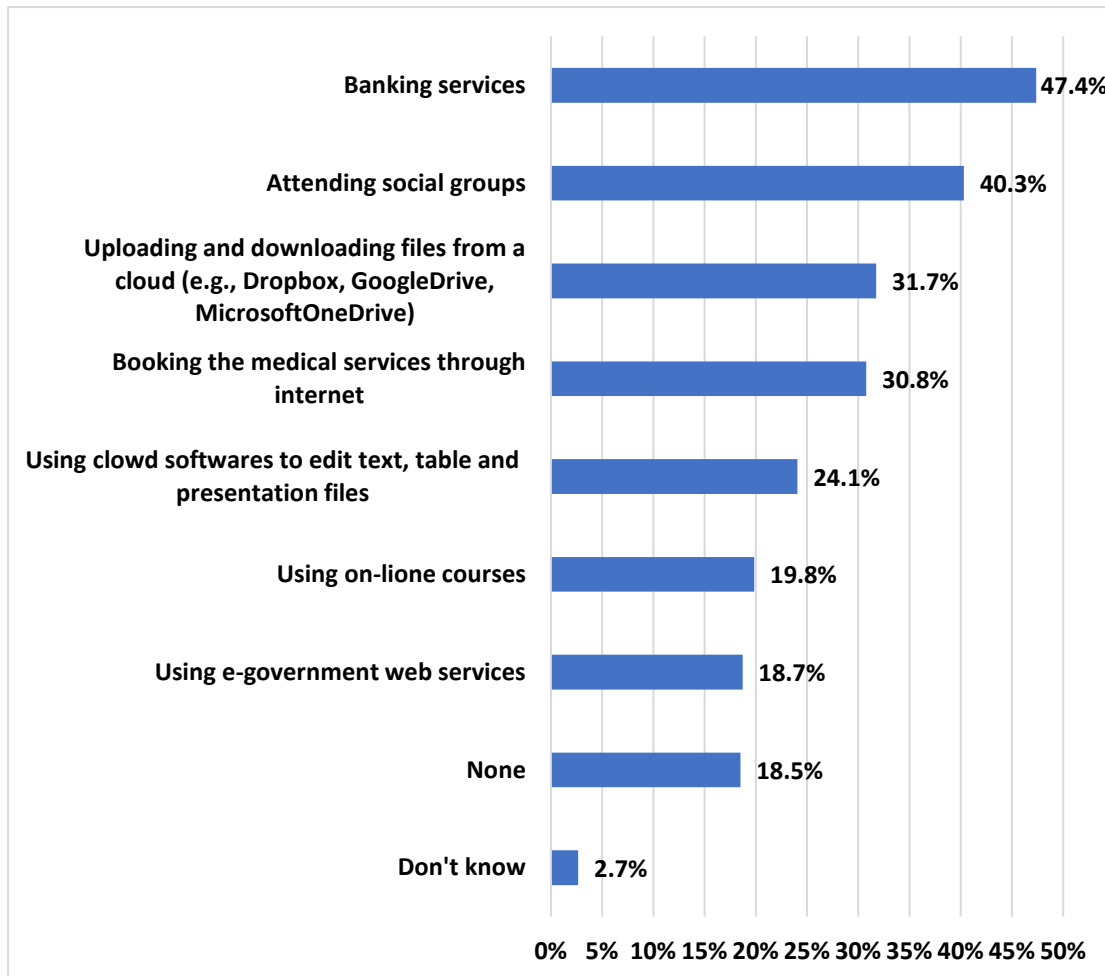
When analyzed by age, a manority in all age groups have the highest proportion for browsing/reading/commenting/pressing the Like button/posting on social media, with the highest rate 92.4% among 16–25-year-olds and the lowest rate 77.3% among those aged 66 and over.

When analyzed by marital status, browsing/reading/commenting/pressing the Like button/posting on social media makes up for the largest proportion for behaviors around the socializing or communicating functions of phones over the Internet regardless of marital status, with the highest rate 91.5% of those unmarried people and the lowest rate 78.5% of those widowed/separated.

## **Using Services over the Internet by Phone Q54**

### **1. Overall analysis**

Beyond phone calls, banking services (47.4%) is the most popular service people use, followed by attending social groups (40.3%), uploading and downloading files from a cloud (31.7%), and booking medical services over the Internet (30.8%) (see Figure 18).



Base : N=962, multiple-choice (people who use the Internet and whose mostly used mobile phones can be accessed to the Internet)

**Figure 18 Using Services over the Internet by Phone**

## 2. Comparative analysis

### (1) Analysis of regional differences

The cross analysis suggests that, except for Yilan, Hualien and Taitung where interviewees attending social groups constitutes the largest proportion for using services **over the Internet** by phone, those in the other regions mainly use banking services, with the highest rate 52.1% in Taipei City, New Taipei City and Keelung and the lowest 42% in Yunlin, Chiayi and Tainan.

### (2) Analysis of basic differences

When analyzed by gender, the highest rates for both men (42.7%) and women (51.9%) are using mainly banking services.

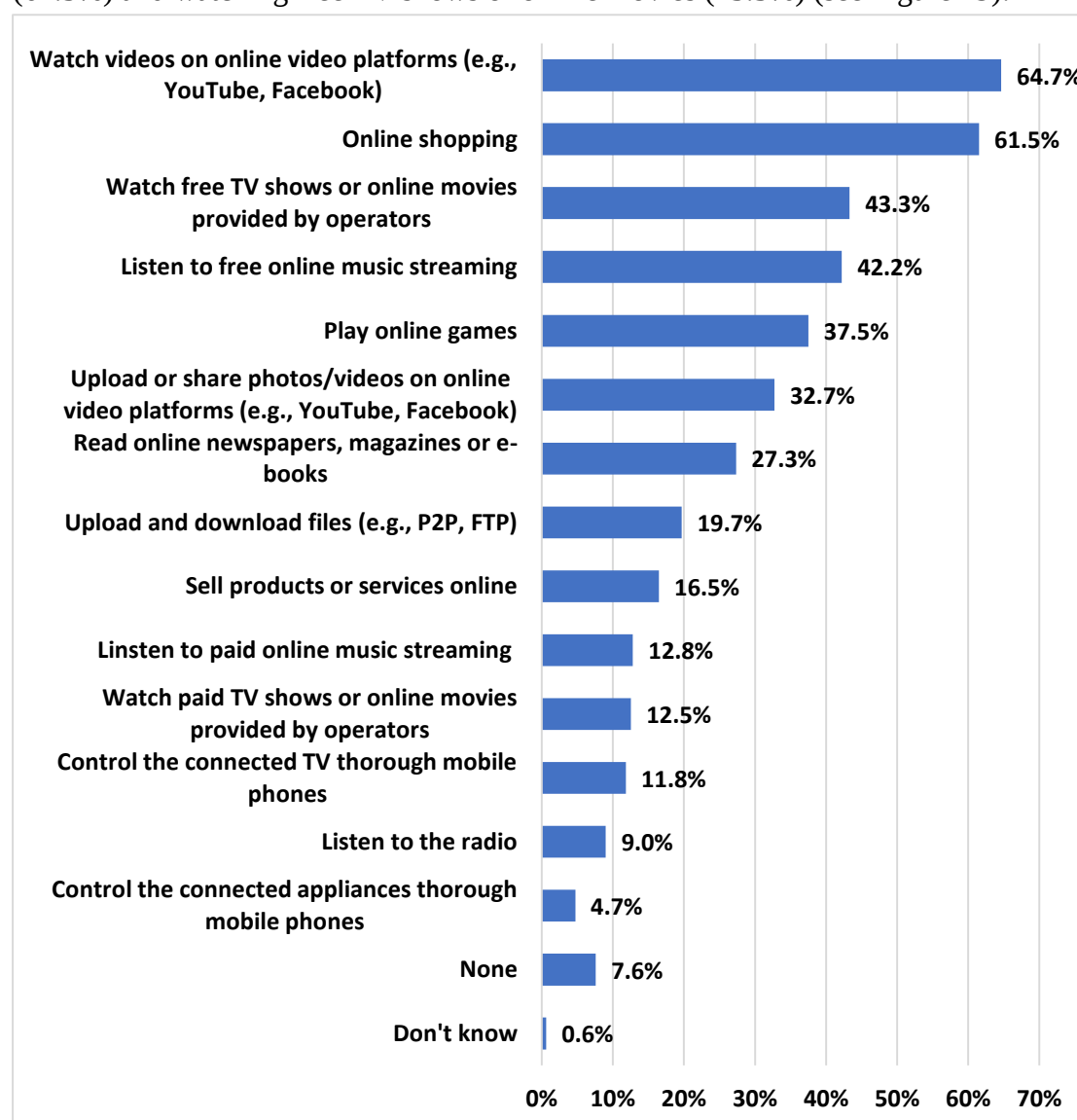
When analyzed by age, using services **over the Internet** by phone differ by age group. People aged 26–35 (70.9%), 36–45 (65.7%) and 46–55 (43.2%) use mainly banking services, while those aged 16–25 (54.4%) and 56–65 (33.6%) are mainly for attending social groups. Using none of these services (43.9%) constitutes largest portion of people aged 66 and over.

When analyzed by marital status, regardless of marital status using banking services make up the largest proportion of interviewees, with the highest rate 51.5% of those unmarried and the lowest 37.6% of those widowed/separated.

## Using Phone Internet Functions Q55

### 1. Overall analysis

Beyond phone calls, watching video clips on online video platforms (64.7%) ranks the most popular function which people use by phone, followed by online shopping (61.5%) and watching free TV shows or online movies (43.3%) (see Figure 19).



Base : N=962, multiple-choice (people who use the Internet and whose mostly used mobile phones can be accessed to the Internet)

**Figure 19 Using Phone Functions Internet (Top 10)**

### 2. Comparative analysis

#### (1) Analysis of regional differences

The cross analysis suggests that people using phone internet functions by differs

by region. Online shopping constitutes the largest portion of people in Taipei City, New Taipei City and Keelung (62%) as well as Taichung, Changhua and Nantou (63.9%), while watching online video clips on online video platforms makes up the largest portion of those in the other regions, with the highest rate 75.2% of Taoyuan, Hsinchu and Miaoli as well as Yilan, Hualien and Taitung and the lowest rate 67.3% of Yunlin, Chiayi and Tainan.

## (2) Analysis of basic differences

When analyzed by gender, men (63.8%) mainly watch video clips on online video platforms, while women (69.3%) have the highest rate for online shopping.

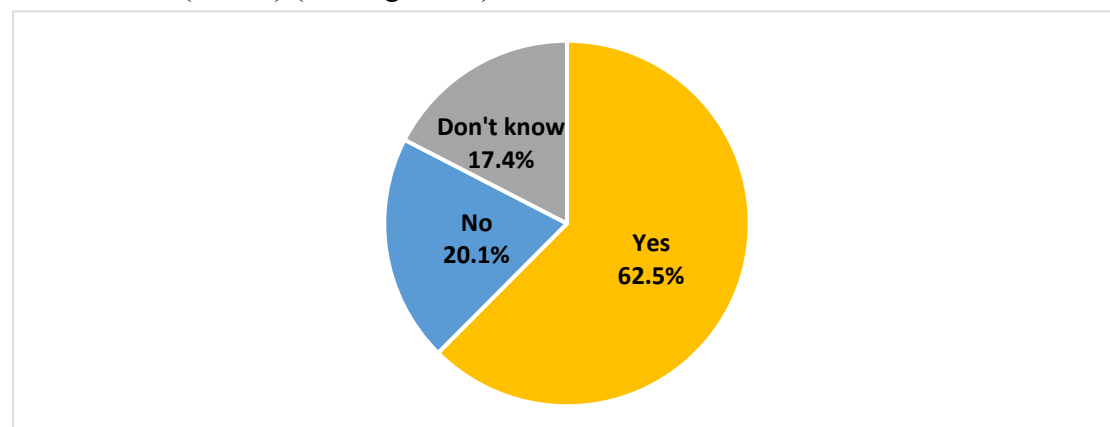
When analyzed by age, using phone Internet functions varies by age groups. Online shopping makes up the largest proportion of people aged 16–25 (80%), 26–35 (80.4%) and 36–45 (71.9%), while watching video clips on online video platforms constitutes the largest proportion of those aged 46–55 (63.1%), 56–65 (59.3%) as well as those 66 and over (45.1%). In addition, the proportion of playing online games of 16–25-year-olds (73.9%) is distinctively higher than the other age groups and the rate of playing online games decreases by age group. On the other hand, the proportion using none of these functions for those aged 66 and over (30.3%) is noticeably higher than the other groups.

When analyzed by marital status, online shopping constitutes the largest proportion for those unmarried (73.4%), while watching video clips on online video platforms makes up the largest portion of those married (60.6%) and those widowed/separated (60.5%).

## Are you willing to move from 4G to 5G Q56

### 1. Overall analysis

Those who are willing to move from 4G to 5G make up the largest share (62.5%) of all interviewees, followed by those who are not (20.1%) and those who answered “I don’t know” (17.4%) (See Figure 20).



Base: N=898, multiple answers allowed (those who have a mobile data plan)

**Figure 20 Are You Willing to Move from 4G to 5G**

## **2. Comparative analysis**

### **(1) Analysis on regional differences**

The Chi-square test suggests that whether one is willing to move to 5G is significantly related to area where one lives.

The cross analysis suggests that those who replied yes to the question make up the largest percentage of interviewees from all areas. Interviewees from Taoyuan, Hsinchu, and Miaoli have the highest ratio (78.2%), while those from Taipei City, New Taipei City, and Keelung have the lowest (51.5%).

### **(2) Analysis on basic differences**

The Chi-square test suggests that whether one is willing to move to 5G is significantly related to age and marital status.

When analyzed by gender, the majority of both men (62.8%) and women (62.2%) are willing to move to 5G services.

When analyzed by age, those who answered yes to 5G make up the largest portion of interviewees for all age groups. Interviewees aged 36-45 have the highest percentage (68.8%); while those aged 66 and over have the lowest (46.1%). In addition, interviewees aged 66 and over have a significantly higher percentage (40.1%) to reject 5G than those of any other age group.

When analyzed by marital status, those who welcome 5G make up the largest portion of interviewees regardless of marital status. Those unmarried interviewees have the highest percentage (68.1%) while those married have the lowest (58.5%).

### **(3) Analysis on differences in social and economic status**

The Chi-square test suggests that whether one is willing to move to 5G is significantly related to education level and profession.

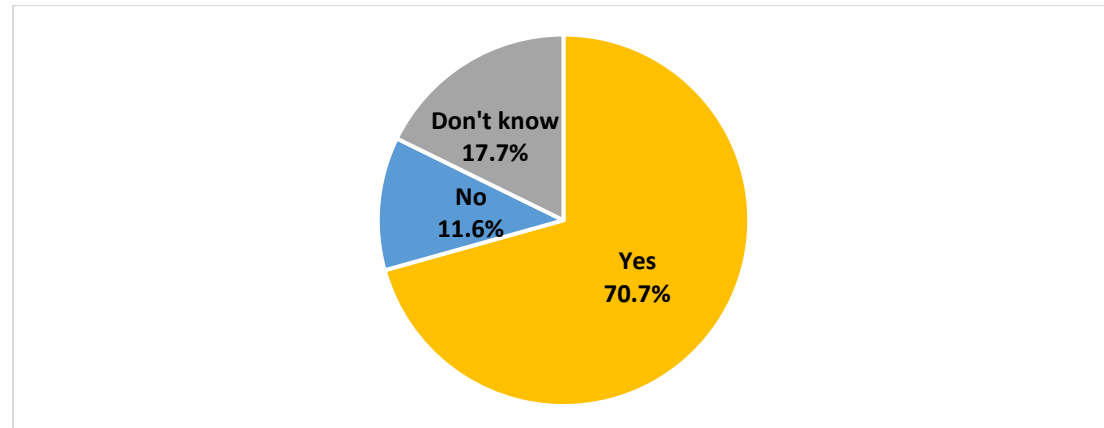
When analyzed by education level, those who answered yes to 5G make up the largest portion of interviewees of all education levels except those with elementary school education or below, where the percentage of those saying yes (36.1%) is lower than that of those saying no (52.6%).

When analyzed by profession, those who welcome 5G make up the largest portion of interviewees of all professions. Those in manufacturing have the highest percentage (80.3%), while housekeepers have the lowest (45.1%). In addition, housekeepers have a significantly higher percentage (39.4%) to reject 5G than those in any other profession. However, samples of those in the electricity and gas supply industries were not included in the analysis due to the few number of samples.

## **Are you willing to move from 4G to 5G if a 5G data plan costs more than a 4G plan in the future Q57**

### **1. Overall analysis**

Those who are willing to move from 4G to 5G (70.7%) if a 5G data plan costs more than a 4G plan in the future far outnumber those who are not (11.6%) (See Figure 21).



Base: N = 561, multiple answers allowed (those who are willing to change from 4G to 5G)

**Figure 21 Are You Willingness to Move from 4G to 5G If a 5G Data Plan Costs More Than a 4G Plan in the Future**

### **2. Comparative analysis**

#### **(1) Analysis on regional differences**

The cross analysis suggests that those who answered yes to the question make up the largest percentage of interviewees from all areas. Interviewees from Taipei City, New Taipei City, and Keelung have the highest percentage (75.3%); while those from Kaohsiung, Pingtung, and Penghu have the lowest (67.1%).

#### **(2) Analysis on basic differences**

When analyzed by gender, the majority of men (72.1%) and women (69.3%) are willing to move to 5G services even if a 5G data plan costs more than a 4G plan.

When analyzed by age, the number of those surveyed answering yes to 5G increases with seniority. Those who answered yes to the question make up the largest ratio of interviewees of all age groups. Among them, the highest portion (85.3%) were seen in interviewees aged 66 and over; while the lowest (64.2%) were those aged 16-25.

When analyzed by marital status, those who gave a positive answer to the question make up the majority of interviewees of all marital statuses, with the highest percentage (73.9%) of those married and the lowest (65.5%) among those widowed/separated.

#### **(3) Analysis on differences in social and economic status**

The Chi-square test suggests that whether one is willing to move to 5G if a 5G data plan costs more than a 4G plan is significantly related to residence and individual average monthly income.

When analyzed by residence, those who responded positively make up the majority of both interviewed house owners (72.5%) and renters (65.2%). Interviewed house renters (17.8%) have a higher rate to answer no than interviewed house owners (10.1%).

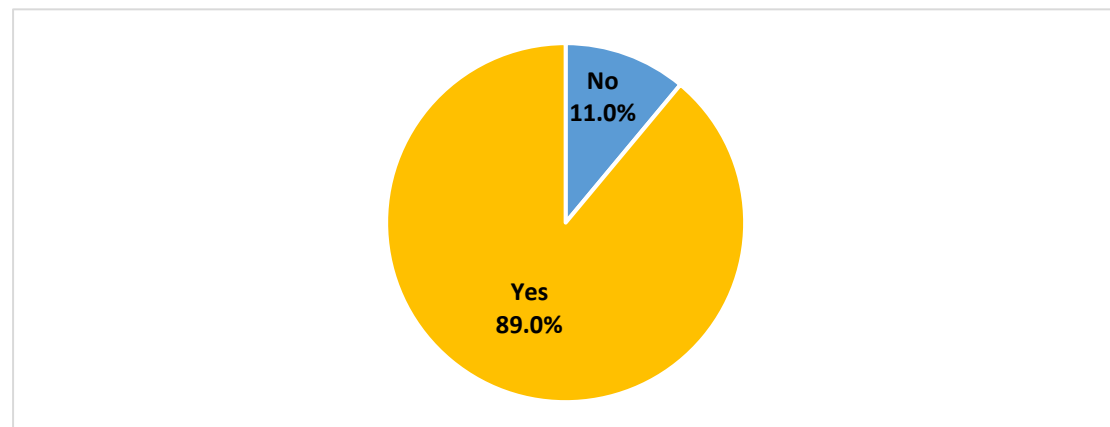
When analyzed by average monthly individual income, those who provided a positive response make up the largest number of interviewees of all incomes. Those who earn NT60,000 or more have the highest ratio (89.3%), while those with no income have the lowest (54%).

## E. Internet Usage

### Internet Usage Q3

#### 3. Overall analysis

The survey shows that 89% of people in Taiwan aged 16 and over use the Internet, while 11% of them do not (see Figure 22).



Base : N=1,103, single-choice

**Figure 22 Internet Usage**

#### 4. Comparative analysis

##### (1) Analysis of regional differences

The result of Chi-square tests indicates that Internet usage by people aged 16 and over varies significantly by region.

The cross test suggests that the proportions of Internet usage of people in Taoyuan, Hsinchu and Miaoli (92.9%), Taichung, Changhua and Nantou (92.4%) as well as Yunlin, Chiayi and Tainan (90%) are over 90%, while the proportions in the other regions are over 85%, with the lowest rate 85.2% in Taipei City, New Taipei City and Keelung (85.2%).

##### (2) Analysis of basic differences

The result of Chi-square tests indicates that Internet usage by people aged 16 and over significantly varies by age and marital status.

When analyzed by gender, men have a lower rate (88.3%) of Internet usage than women (89.6%).

When analyzed by age, most people of every age group use the Internet, with the highest rate 99.2% of those aged 26–35 and the lowest 57.2% of those aged 66 and over. In addition, the rate of those aged 66 and over (42.8%) and do not use Internet ranks the highest among all groups, followed by those aged 56–65 (15.1%).

When analyzed by marital status, most people use the Internet regardless of marital status, with the highest rate 98.5% of those unmarried and the lowest rate 80.7% of those widowed/separated.

### **(3) Analysis of differences in social and economic status**

The result of Chi-square tests indicates that Internet usage by people aged 16 and over significantly varies by housing tenure, education level and individual average monthly income.

When analyzed by housing tenure, house renters have higher Internet usage (97.3%) than home owners (86.6%).

When analyzed by education level, except for those with elementary education or lower (60.4%), most people of each educational level use the Internet, with the highest rate 99.6% of people with a bachelor's degree and the lowest rate 75.5% of those with high school and secondary education

When analyzed by individual average monthly income, interviewees of all income groups have a higher rate of Internet usage, with the highest rate 98.3% of the NT50,000-NT59,999 group and the lowest rate 74.6% of the NT10,000-19,999 group.

## **Total hours spending on the Internet per week Q4**

### **1. Overall analysis**

The survey shows that Taiwanese people aged 16 and over spend 41.2 hours on the Internet per week on average (N =981, people who use the Internet).

### **2. Comparative analysis**

#### **(1) Analysis of regional differences**

Cross analysis shows that people in all regions spend over 30 hours using the Internet. Among them, people in Yunlin, Chiayi and Tainan spend the most time (51.65 hours) using the Internet, while those in Yilan, Hualien and Taitung spend the least time (31.52 hours) (see Table 15).

**Table 15 Total Hours Spending on Internet Per Week (By Region)**

Unit : hour

| Region                                   | Average Hours |
|------------------------------------------|---------------|
| Taipei City, New Taipei City and Keelung | 42.88         |
| Taoyuan, Hsinchu and Miaoli              | 39.76         |
| Taichung, Changhua and Nantou            | 37.36         |
| Yunlin, Chiayi and Tainan                | 51.65         |
| Kaohsiung, Pingtung and Penghu           | 39.77         |
| Yilan, Hualien and Taitung               | 31.52         |
| <b>Average Score</b>                     | <b>41.20</b>  |

Resource: Results of this research

## (2) Analysis of basic differences

When analyzed by gender, men spend less time (40.42 hours) using the Internet than women (41.92 hours) per week.

When analyzed by age, the time people spend on the Internet decreases with age, with the most time (52.31 hours) by people aged 26–35 and the least time (20.17 hours) by those aged 66 and over per week.

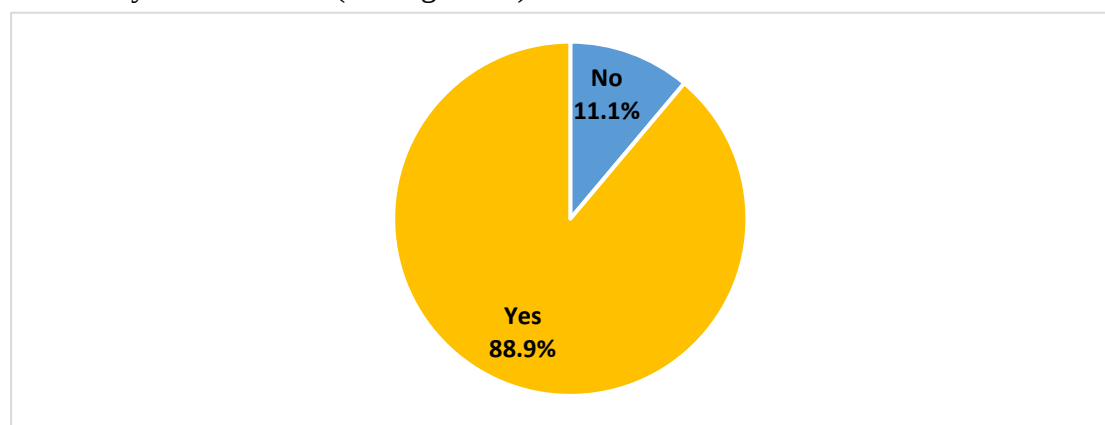
When analyzed by marital status, unmarried people spend the most time on the Internet per week (52.31 hours) and those widowed/separated the least time (32.31 hours).

## F. Internet Usage at Home

### Households Penetration Rate of Internet Accessibility Q58

#### 1. Overall analysis

88.9% of people in Taiwan aged 16 and over have access to the Internet at home, while only 11.1% do not (see Figure 23).



Base : N=1,103, single-choice

**Figure 23 Internet Accessibility at Home**

#### 2. Comparative analysis

### **(1) Analysis of regional differences**

The result of Chi-square tests indicates that household Internet accessibility significantly varies by region.

The cross test shows that people who can access the Internet at home makes up the largest proportion in all regions, with the highest rate 94.7% in Taoyuan, Hsinchu and Miaoli and the lowest rate 77% in Kaohsiung, Pingtung and Penghu.

### **(2) Analysis of regional differences**

The result of Chi-square tests indicates that the household Internet accessibility significantly varies by age and marital status.

When analyzed by gender, 88.2% of men and 89.5% of women can access the Internet at home.

When analyzed by age, people who can access the Internet at home makes up the largest proportion regardless of age, with the highest rate 96.8% of those aged 16–25 and the lowest rate 72.7% of those aged 66 and over.

When analyzed by marital status, people who can access the Internet at home constitutes the largest proportion regardless of marital status, with the highest rate 95.7% of those unmarried and the lowest rate 80.7% of those widowed/separated.

### **(3) Analysis of differences in social and economic status**

The result of Chi-square tests indicates that the household Internet accessibility significantly varies by education level and individual average monthly income.

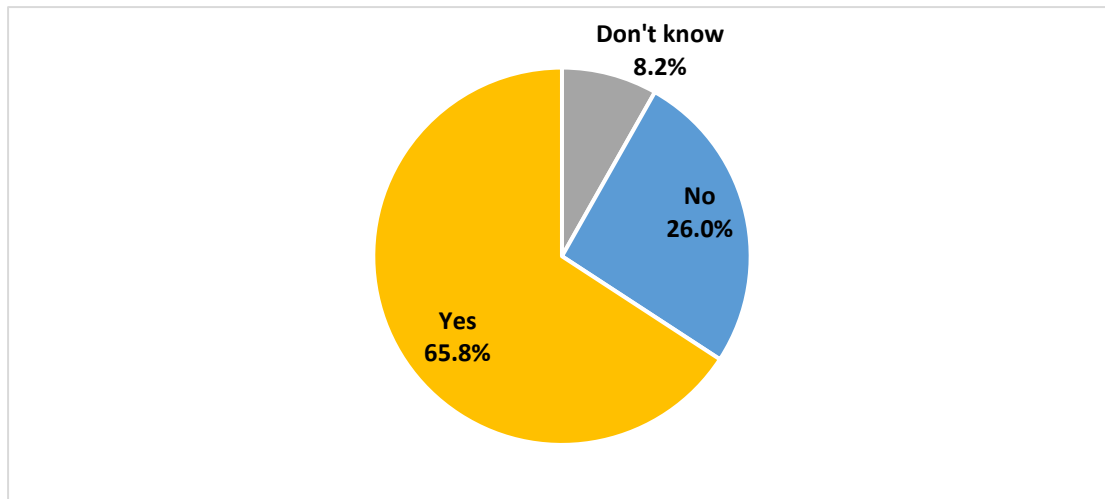
When analyzed by education level, people who can access the Internet makes up the largest proportion regardless of education level, with the highest rate 96.8% of people with a master's degree or higher and the lowest rate 55.9% of those with elementary school education lower.

When analyzed by individual average monthly income, people who can access the Internet at home constitutes the largest portion among all income groups, with the highest rate 95.9% of those earning NT40,000-NT49,999 and the lowest rate 78.3% earning NT\$1-9,999.

## **Household Ownership of Fixed-line Broadband Q59**

### **1. Overall analysis**

The proportion of Taiwanese people aged 16 and over having fixed-line broadband at home is 65.8%, higher than the rate 26% for those who do not have any (see Figure 24).



Base : N=980, single-choice (people who can access the Internet at home)

**Figure 24 Household Ownership of Fixed-line Broadband**

## **2. Comparative analysis**

### **(1) Analysis of regional differences**

The result of Chi-square tests indicates that the household ownership of fixed-line broadband significantly varies by region.

The cross test shows that people having the fixed-line broadband at home make up the largest portion in all regions, with the highest rate 74.2% in Taoyuan, Hsinchu and Miaoli and the lowest rate 62.1% in Yunlin, Chiayi and Tainan.

### **(2) Analysis of basic differences**

The result of Chi-square tests indicates that the household ownership of fixed-line broadband at home significantly varies by marital status.

When analyzed by gender, 66.1% of women and 65.5% of men have fixed-line broadband at home.

When analyzed by age, people having fixed-line broadband at home constitutes the largest portion among all age groups, with the highest rate 73.8% of 26–35-year-olds and the lowest rate 53% of those aged 66 and over.

When analyzed by marital status, having fixed-line broadband at home differs with marital status, With 70.1% of Unmarried and 66% of married people have fixed-line broadband at home, while 45.5% of those widowed/separated do not have fixed-line broadband at home.

### **(3) Analysis of differences in social and economic status**

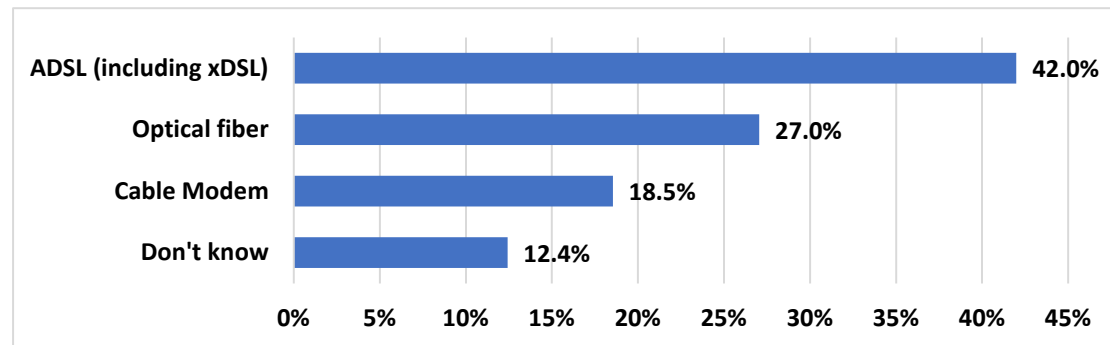
The result of Chi-square tests indicates that household ownership of fixed-line broadband significantly varies by housing tenure.

When analyzed by housing tenure, both home owners (67.2%) and house renters (59.6%) have fixed-line broadband at home.

## Fixed-line Broadband Services at Home Q63

### 1. Overall analysis

Among the types of fixed-line broadband used at home, ADSL makes up the largest portion (42%), followed by optical fiber (27%) and Cable Modem (18.5%) (see Figure 25).



Base: N=645, single-choice (people who have fixed-line broadband at home)

**Figure 25 Fixed-line Broadband at Home**

### 2. Comparative analysis

#### (1) Analysis of regional differences

The cross analysis suggests that the proportion of people using ADSL (including xDSL) makes up the largest portion in all regions, with the highest rate 53.8% in Yilan, Hualien and Taitung and the lowest rate 36.4% in Taipei City, New Taipei City and Keelung.

#### (2) Analysis of basic differences

When analyzed by gender, both men (42.9%) and women (41.2%) have the highest rates for using ADSL (including xDSL) at home.

When analyzed by age, the majority in all age groups use ADSL (including xDSL) at home, with the highest rate 46.9% of those aged 26–35 () and 36–45, and the lowest rate among those aged 66 and over.

When analyzed by marital status, those unmarried (40.5%) and those married (44.4%) both have the highest rates for using mainly ADSL (including xDSL) at home while those widowed/separated (32.8%) have the highest rate for using optical fiber.

#### (3) Analysis of differences in social and economic status

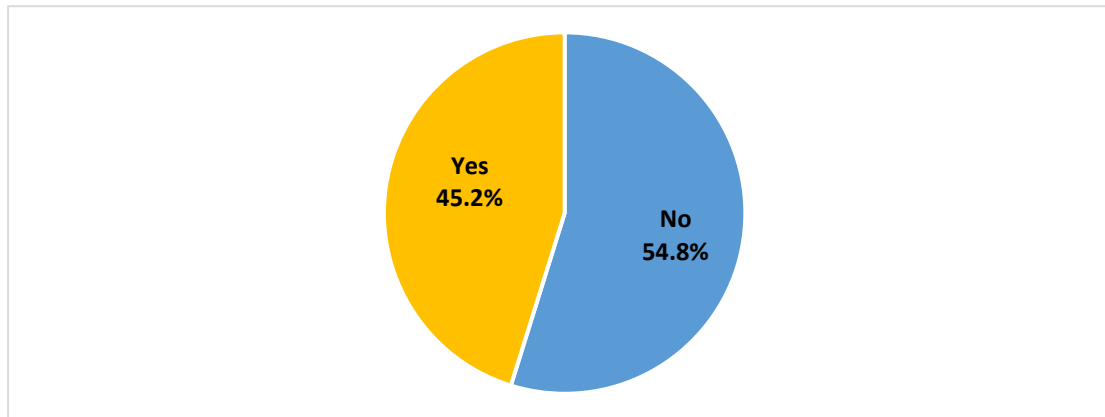
The Chi-square test shows that the types of fixed-line broadband used at home significantly varies by average monthly individual income.

When analyzed by individual average monthly income, except for people of no income (30.1%) who mainly using Cable Modem at home, using ADSL (including xDSL) at home constitutes the largest portion of the other income groups, with the highest rate 47.1% of those earning NT\$50,000-59,999 and the lowest rate 39.9% of those earning NT\$1-9,999.

## **Whether an Interviewee Knows there Are Certain Cable Operators Joining the Market to Provide Broadband Service in One's Living Area Q64**

### **1. Overall analysis**

Concerning whether an interviewee knows there are other cable operators joining the market to provide broadband service in one's living area, up to 54.8% of people do not know, which is more than the 45.2% who know there are other cable operators joining the market to provide broadband service in one's living area (See Figure 26).



Base: N=498, single-choice

**Figure 26 Whether An Interviewee Knows there Are Different Cable Operators Joining the Market to Provide Broadband Service in One's Local Area**

### **2. Comparative analysis**

#### **(4) Analysis of regional differences**

The Chi-square test shows that whether an interviewee knows there are other cable operators joining the market to provide broadband services in one's local area significantly varies by regions.

The cross analysis suggests that, among the cities where new operators have joined (New Taipei City, Taipei City, Kaohsiung, and Changhua), people who do not know there are new operators providing broadband services constitutes the larger proportion in New Taipei City (68.2%) while those who know there are new operators providing broadband services make up the larger proportions in Taipei City (53.7%), Kaohsiung (52.8%) and Changhua (52.3%)

#### **(5) Analysis of basic differences**

The Chi-square test shows that whether an interviewee knows certain cable operators providing broadband services in one's local area significantly varies by age.

When analyzed by gender, the majority of both men (56.8%) and women (52.9%) do not know there are different cable operators providing broadband services in their local areas.

When analyzed by age, people aged 46-55 (52.8%) and 56-65 (56.1%) have higher

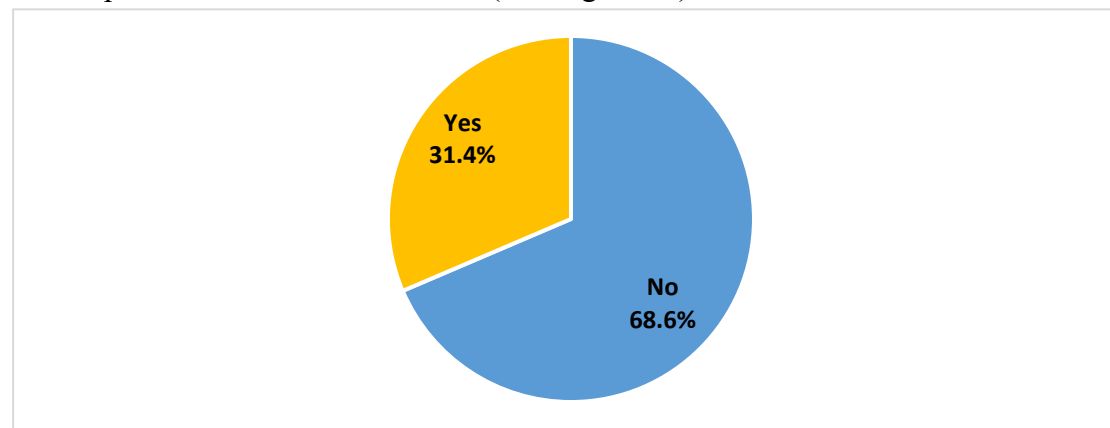
rates of those who know there are different operators providing broadband services in their local areas, while those in other age groups have higher rates of not knowing, with the highest rate 66% of those aged 66 and over, and the lowest rate 53.1% of those aged 36-45.

When analyzed by marital status, more people do not know there are different cable operators providing broadband services in their local areas regardless of marital status, with the highest rate 57.6% of those unmarried and the lowest rate 53.1% of those married.

## **Whether an Interviewee Changed to a Different Cable Operator after the Cross-Area Market Is Opened Q65**

### **1. Overall analysis**

After the cable cross-area market is opened, 31.4% of people have changed cable operator while 68.6% have not (See Figure 27).



Base: N=225, single-choice (people who know there are different cable operators providing broadband services in their local area)

**Figure 27 Whether an Interviewee Change to a New Cable Operator after the Cross-Area Market Was Opened**

### **2. Comparative analysis**

#### **(1) Analysis of regional differences**

The cross analysis suggests that, among the cities where different operators have joined the market (New Taipei City, Taipei City, Kaohsiung, and Changhua), most people in the four cities have not changed cable operators. Among those who have changed cable operators, people in New Taipei City have the highest rate (41.6%) while Kaohsiung has the lowest (24%).

#### **(2) Analysis of basic differences**

When analyzed by gender, 70.1% of women and 66.9% of men have not changed to certain operators after the cross-area cable market was opened.

When analyzed by age, more people in all age groups have not changed to certain

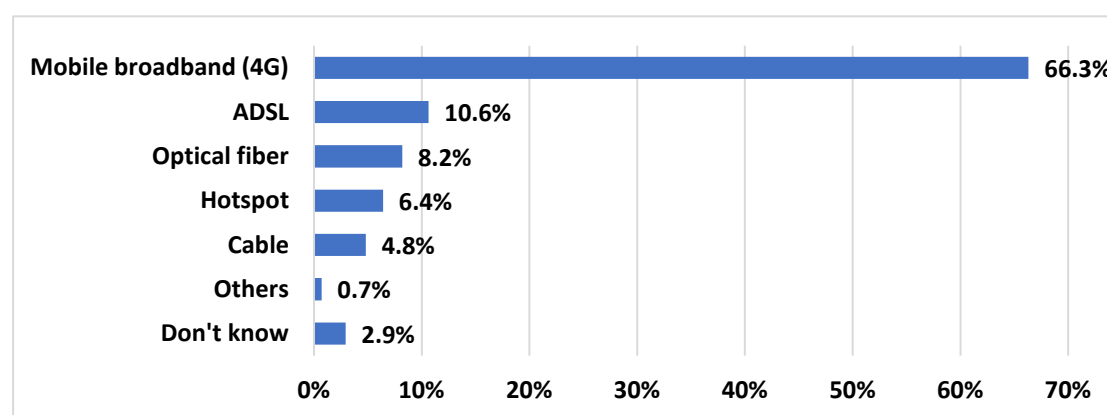
cable operators after the cross-areaed cable market is opened. Among those who do change, 38.9% of 56-65-year-olds is the highest rate while 12.1% of 16-25-year-olds is the lowest.

When analyzed by marital status, more people have not changed to certain operators regardless of marital status. Among those who have changed the operator, married people have the highest rate of 33% while widowed/separated people have the lowest rate of 8.5%.

## The Most Common Ways Used to Access the Internet at Home Q67

### 1. Overall analysis

As mobile broadband has become widespread, the way that people access the Internet is not limited to fixed broadband. There are 66.3% accessing the Internet through mobile broadband (4G), followed by ADSL (10.6%) (see Figure 26).



Base : N=940, single-choice (people who can access the Internet at home and know which ways to access the Internet)

**Figure 28 The Most Common Ways Used to Access the Internet at Home**

### 2. Comparative analysis

#### (1) Analysis of regional differences

The cross analysis suggests that most people using 4G to access the Internet constitutes the largest proportion in all regions, with the highest rate 69.3% of Yilan, Hualien and Taitung and the lowest rate 56.3% of Taoyuan, Hsinchu and Miaoli.

#### (2) Analysis of basic differences

When analyzed by gender, 64.2% of men and 68.3% of women use 4G to access the Internet.

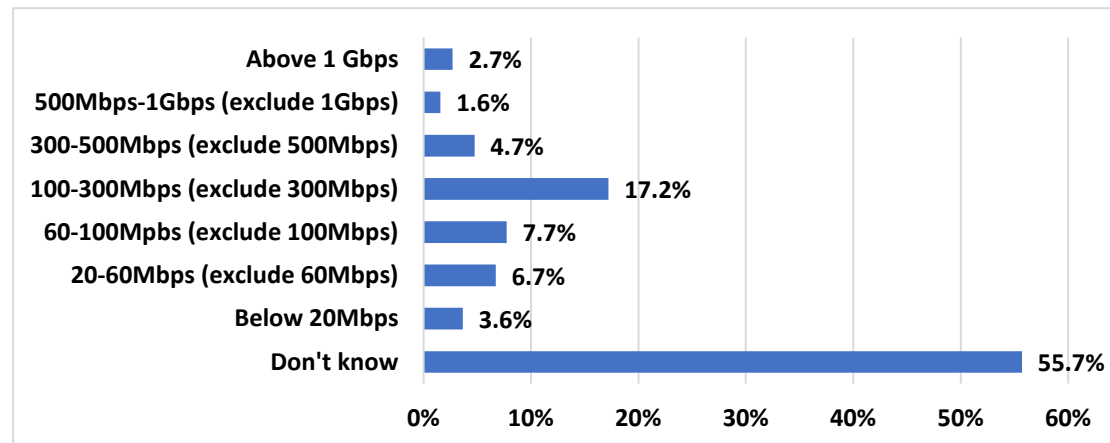
When analyzed by age, most people in all age groups use 4G to access the Internet, with the highest rate 72.1% of 46–55-year-olds and the lowest rate 57.2% of those who aged 36–45.

When analyzed by marital status, people mainly use 4G to access the Internet regardless of marital status, with the highest rate 70.6% among those widowed/separated and the lowest rate 64.8% of those married.

## Speed of Fixed-Line Broadband at Home Q74

### 1. Overall analysis

The highest rate of Taiwanese people using a fixed-line broadband speed at home is 17.2% using 100-300Mbps, followed by 7.7% using 60-100Mbps (excluding 100Mbps). However, there are 55.7% people who do not know the speed of their fixed line at home (see Figure 29).



Base : N=645, single-choice (people who have fixed-line broadband at home)

**Figure 29 Speed of Fixed-Line Applied at Home**

### 2. Comparative analysis

#### (1) Analysis of regional differences

The cross analysis suggests that people who do not know the speed of their fixed line broadband at home constitute the largest proportions in all regions, with the highest rate 64.1% in Yunlin, Chiayi and Tainan and the lowest rate 46.6% in Taichung, Changhua and Nantou.

#### (2) Analysis of basic differences

When analyzed by gender, both most of men (48.8%) and women (62.2%) do not know the speed of fixed-line broadband at home.

When analyzed by age, people who do not know the speed of fixed-line broadband at home make up the largest proportion in all age groups, with the highest rate 76.8% of people aged 66 and over and the lowest rate of 40.1% of those aged 36–45.

When analyzed by marital status, people regardless of marital status do not know the speed of their fixed- line broadband at home make up the largest proportions, with the highest rate 60.2% of those widowed/separated and the lowest rate 55.1% of those unmarried.

## Satisfaction with Quality of Fixed-Line Broadband Q79

### 1. Overall analysis

The average score for satisfaction with the quality of fixed-line broadband is 7.21 (1-point is very dissatisfied, and 10 points is very satisfied; N=645, people have fixed-line broadband at home)

### 2. Comparative analysis

#### (1) Analysis of regional differences

The results of the one-way ANOVA analysis indicates that the average score for satisfaction with the quality of fixed-line broadband significantly varies by regions.

The cross analysis suggests that the average score 7.7 for satisfaction with the quality of fixed-line broadband of people in Taipei City, New Taipei City and Keelung is the highest and the lowest score 6.56 of Taichung, Changhua and Nantou (see Table 16).

**Table 16 Satisfaction with Quality of Fixed-Line Broadband (By Region)**

| Region                                   | Average Hours |
|------------------------------------------|---------------|
| Taipei City, New Taipei City and Keelung | 7.70          |
| Taoyuan, Hsinchu and Miaoli              | 7.08          |
| Taichung, Changhua and Nantou            | 6.56          |
| Yunlin, Chiayi and Tainan                | 6.95          |
| Kaohsiung, Pingtung and Penghu           | 7.43          |
| Yilan, Hualien and Taitung               | 7.19          |
| <b>Average Score</b>                     | <b>7.21</b>   |

Resource: Results of this research

#### (2) Analysis of basic differences

The results of the one-way ANOVA analysis indicates that the average score for satisfaction with the quality of fixed-line broadband significantly varies by age.

When analyzed by gender, the average satisfaction for women using fixed-line broadband is 7.21 points, which is slightly higher than the satisfaction of men (7.2).

When analyzed by age, the average satisfaction for 46–55-year-olds is the highest (7.63) while the score for 16–25-year-olds is the lowest (6.69).

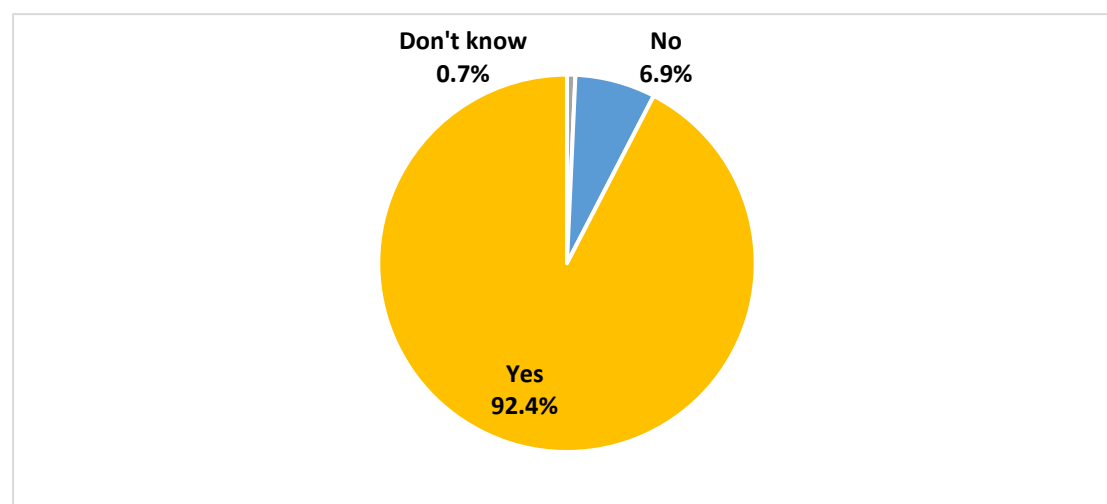
When analyzed by marital status, the highest average satisfaction score for using fixed-line broadband at home is among those widowed/separated (7.42) and the lowest score is for those unmarried (7.03).

## G. Usage of Voice Calls over the Internet

### Usage of Voice Calls over the Internet Q81

#### 1. Overall analysis

With the development of smartphone and mobile broadband services, 92.4% Taiwanese people and their family members make voice calls over the Internet and only 6.9% and their family never use (see Figure 30).



Base : N=1,024, single-choice (people who know it is possible to make voice calls over the Internet)

**Figure 30 Whether Respondents or Family Members Have Made Voice Calls over the Internet**

## 2. Comparative analysis

### (1) Analysis of regional differences

The result of Chi-square tests indicates that whether interviewees and their family members have made voice calls over the Internet varies by region.

The cross test suggests that the proportion of people who have made voice calls over the Internet is the largest in all regions, with the highest rate of 95.7% in Kaohsiung, Pingtung and Penghu and the lowest rate of 87.8% in Taipei City, New Taipei City and Keelung.

### (2) Analysis of basic differences

The result of Chi-square tests indicates that the rate of people and their family members who have made voice calls over the Internet significantly varies by gender, age and marital status.

When analyzed by gender, both men (90.2%) and women (94.5%) have the highest rates for having made voice calls over the Internet.

When analyzed by age, most people in all age groups have made voice calls over the Internet, with the highest 98.5% of 16-25-year-olds and the lowest rate 73% of those aged 66 and over.

When analyzed by marital status, most people have made voice calls over the Internet regardless of marital status, with the highest rate 96.9% of those unmarried and the lowest 89.8% of married people.

### (3) Analysis of differences in social and economic status

The result of Chi-square tests indicates that those who have made voice calls over the Internet significantly varies by housing tenure and education level.

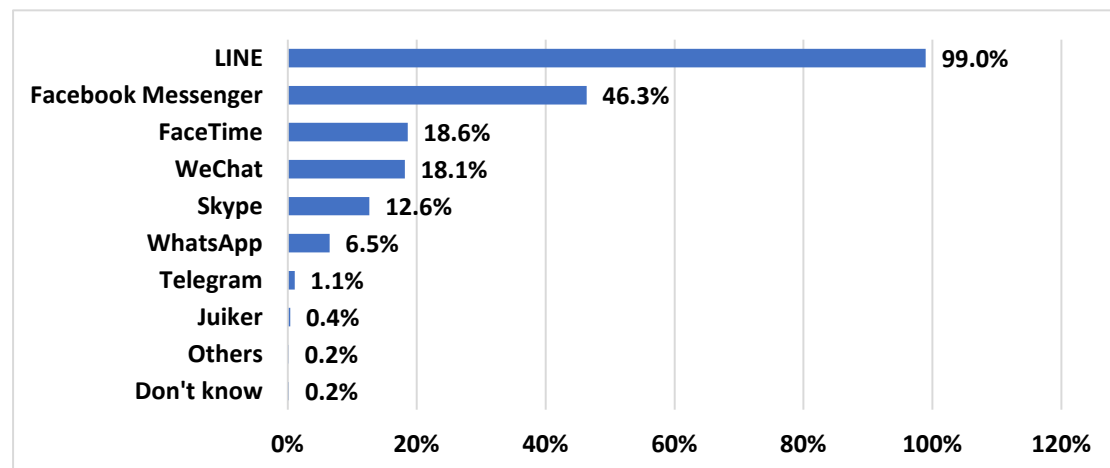
When analyzed by housing tenure, most home owners (91.3%) and house renters (97.2%) have made voice calls over the Internet.

When analyzed by education level, most people of every education level have made voice calls over the Internet, with the highest rate 97.3% of people with a bachelor's degree and the lowest rate 69% among those with elementary school education or lower.

## Voice over Internet Protocol Telephone Services Used Q82

### 1. Overall analysis

LINE is the most popular Voice over Internet Protocol (VoIP) service with rates reaching 99%, followed by Facebook Messenger (46.3%). The rates for using other types of VoIP are all less than 20% (see Figure 31).



Base : N=946, multiple choice (interviewees or their family members who have made voice calls over the Internet)

**Figure 31 The Use of VoIP Service by Respondents or Families**

### 2. Comparative analysis

#### (1) Analysis of regional differences

The cross analysis suggests that LINE is the most popular VoIP service with up to 95% of people or their family members in all regions, with the highest rate 100% of people in Yilan, Hualien and Taitung and the lowest rate 98.3% of Yunlin, Chiayi and Tainan.

#### (2) Analysis of basic differences

When analyzed by gender, using LINE for VoIP has the highest rate for both men (99%) and women (98.9%).

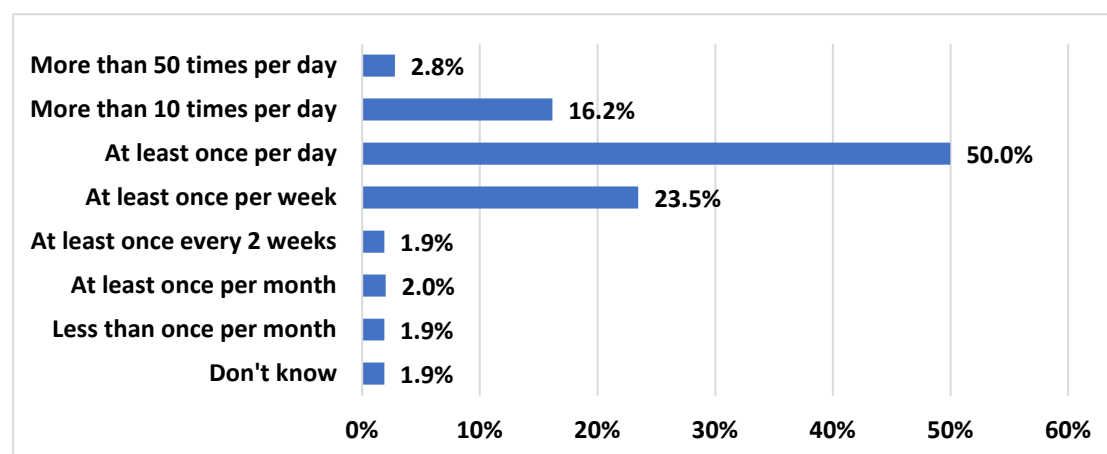
When analyzed by age, up to 95% of people of all age groups mainly use LINE for VoIP service, with the highest rate 100% of people aged 56–65 as well as 66 and over and the lowest rate 96.8% of those aged 16–25.

When analyzed by marital status, up to 95% of people use LINE's VoIP service regardless of marital status, with the highest rate 99.2% among those married and the lowest rate 98.6% of those unmarried.

## Frequency of the use of VoIP services Q83

### 1. Overall analysis

The frequency of using VoIP services for people aged 16 and over to be at least once per day accounts for the highest rate of 50%, followed by at least once per week with a rate of 23.5% (see Figure 32).



Base: N = 946, single-choice (interviewees or their family members who have made voice calls over the Internet)

**Figure 32 Frequency of the use of VoIP services**

### 2. Comparative analysis

#### (1) Analysis of regional differences

The result of cross analysis finds that the frequency of using VoIP services with the highest rate at least once per day makes up the largest proportion in all regions, with the highest rate 58.8% in Yilan, Hualien and Taitung and the lowest rate 44.4% in Taoyuan, Hsinchu and Miaoli.

#### (2) Analysis of basic differences

The result of Chi-square tests indicates that the frequency of using VoIP services varies significantly by marital status.

When analyzed by gender, the frequency of using VoIP services at least once per day has the highest rate among both men (47.3%) and women (52.5%).

When analyzed by age, the frequency of using VoIP services at least once per day has the highest rate for all age groups, with the highest rate 54% of those aged 46-55 and the lowest rate 44% of those aged 16-25.

When analyzed by marital status, the frequency of using VoIP services at least once per day was the highest rate regardless of marital status, with the highest rate 53.8% of those married and the lowest rate 42.9% of those widowed/separated.