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Census of Population 2010 - Increased Use of Internet in Census Submission

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Introduction

The Singapore Department of Statistics conducted the Census of Population 2010 (Census 2010) from mid March to August last year.

The Census 2010 adopted a register-based approach where basic population count and characteristics were compiled from administrative sources.

This was supplemented by a sample enumeration to obtain additional information on marriage and fertility, education and language usage, religion, income, household and housing, and transport that were not available from administrative sources.

This article presents a summary analysis of the response modes used by households when submitting their returns for the Census 2010 survey.

Modes of Submission

The Census 2010 adopted a tri-modal data collection approach comprising self-administered Internet submission and interviews over the telephone or face-to-face performed by census interviewers. All households selected for the census were given the option to respond through any of the modes that best suit their preference.

The tri-modal approach was first introduced in the previous round of census in 2000. In the 1990 and earlier censuses, face-to-face (fieldwork) interviews had been the only mode through which the public could provide their census responses.

Over time, the increasingly widespread use of the Internet and availability of integrated call-centre technologies provided opportunities for modes other than face-to-face interviews to be developed and offered.

Having multiple channels for census responses made it more convenient for the respondents to submit their responses.

Unlike in the past where respondents had to make prior appointments with the interviewers to visit them at their homes at specific dates and times, telephone interviews allowed respondents the flexibility to call and complete the survey within the operating hours of the hotline. The provision of the Internet submission option further enabled the submission process to be available round the clock.

Besides the benefits for respondents, the approach also improved the efficiency in data collection for the Department.

With more respondents submitting their responses over the Internet or phone, less manpower were needed for the resource-intensive field enumeration operations.

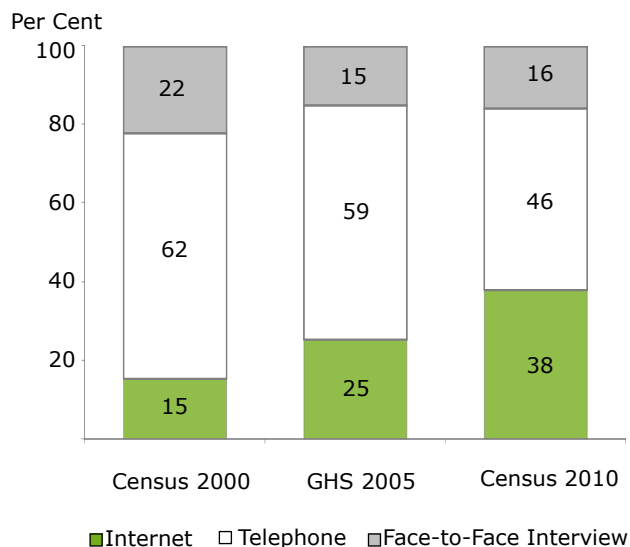
It also enabled the Department to reach households that were increasingly difficult to contact due to the absence of members who may be working and returning home later.

Shifts in Use of Submission Modes

In tandem with Singapore’s rapid growth in Internet usage over the past decade, the proportion of houses submitting their Census forms through the Internet increased significantly between 2000 and 2010.

From 15 per cent in Census 2000 and 25 per cent in the General Household Survey (GHS) 2005, the proportion who submitted their survey returns over the Internet grew to 38 per cent in Census 2010 (Chart 1).

CHART 1 SHIFTS IN USE OF SUBMISSION MODES, 2000-2010



Correspondingly, there was a decrease in the proportion of houses submitting their survey returns over the telephone.

While respondents who submitted their responses over the telephone continued to constitute the majority of the returns, the proportion doing so had declined over the years. This is despite the extension of the daily operating hours for the Census hotline from 9 am to 9 pm in 2000 to 9 am to 10.30 pm in 2010.

Profile of Responding Households

In 2010, households that submitted their returns over the Internet had an average household size of 3.7 persons (Table 1). This is larger than the average size of households who completed via the other two modes.

Some 55 per cent of those who responded through the Internet had 4 or more members in their households compared to only 29 per cent for those responding through face-to-face interviews.

TABLE 1 DISTRIBUTION OF HOUSEHOLD SIZE OF RESPONDING HOUSEHOLDS ACCORDING TO MODE OF SUBMISSION

Household Size	Per Cent		
	Internet	Telephone	Face-to-Face Interview
1 Person	10.4	15.1	39.2
2 Persons	15.3	19.5	18.1
3 Persons	19.0	19.5	13.9
4 Persons	25.2	21.7	12.8
5 and More Persons	30.0	24.1	15.8
Average Household Size (Person)	3.7	3.4	2.6

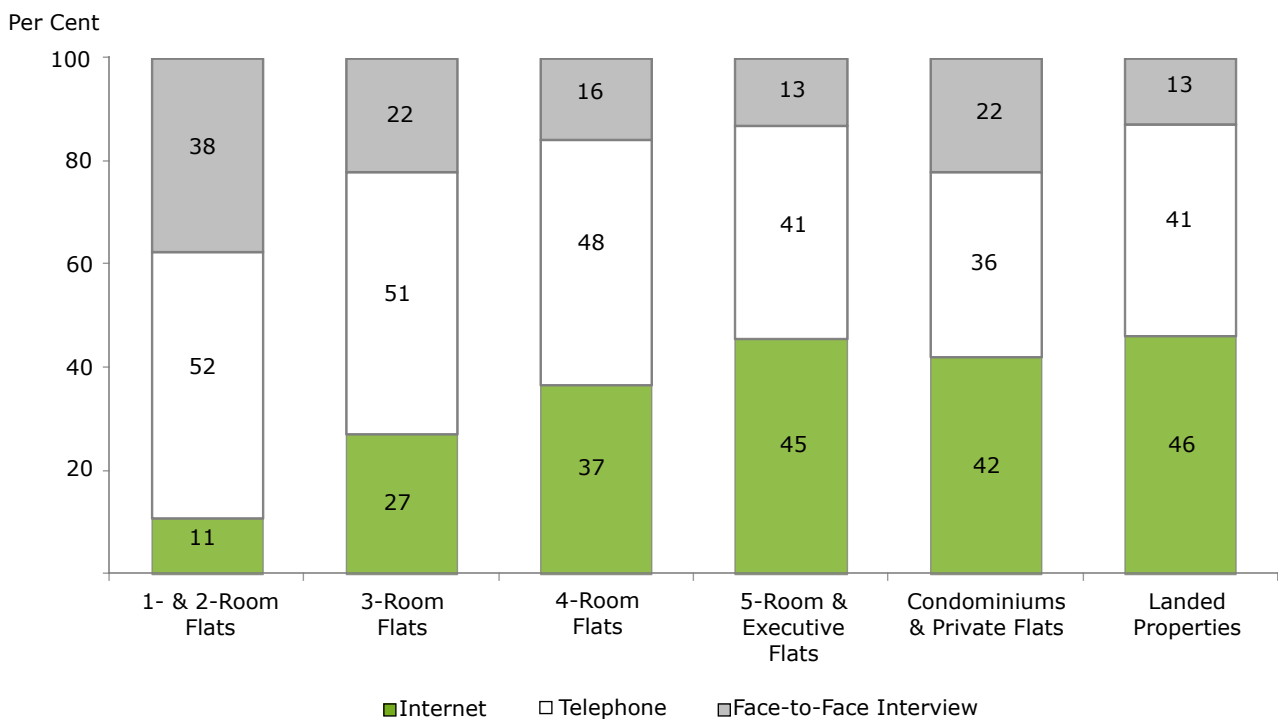
Higher Internet Submission Rate among 5-Room or Larger Flats and Private Housing

The proportion of households using the Internet to submit their returns was higher among those living in 5-room or larger flats and private housing compared to those in smaller HDB flat types (Chart 2).

Some 46 per cent of households living in landed properties submitted their census returns using the Internet.

In contrast, 11 per cent of households staying in 1- and 2-room flats and 27 per cent of those in 3-room flats had used the Internet for their census submissions.

CHART 2 SUBMISSION MODES BY DWELLING TYPES, 2010



Among households living in 1- and 2-room flats, some 38 per cent opted for face-to-face interviews – the highest proportion across all house types.

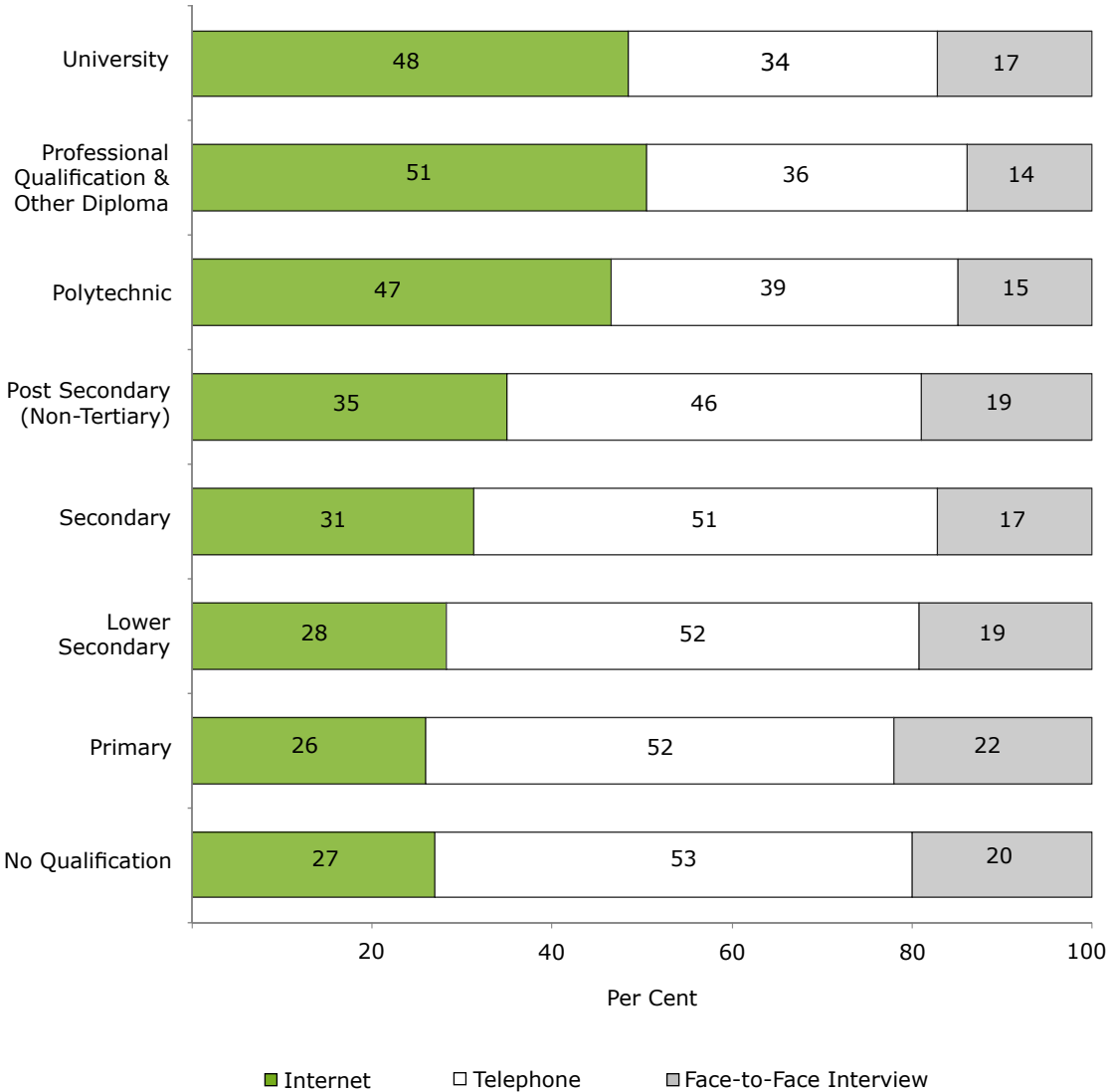
Higher Propensity for Internet Submission among Better-Educated

Households with heads having higher educational qualifications had greater

propensity to use the Internet to submit their census returns. Among households whose heads had university qualification, 48 per cent submitted their returns through the Internet (Chart 3).

The corresponding proportion was lower at below 30 per cent among households whose heads had below Secondary education.

CHART 3 SUBMISSION MODES BY HIGHEST QUALIFICATION ATTAINED BY HEAD, 2010

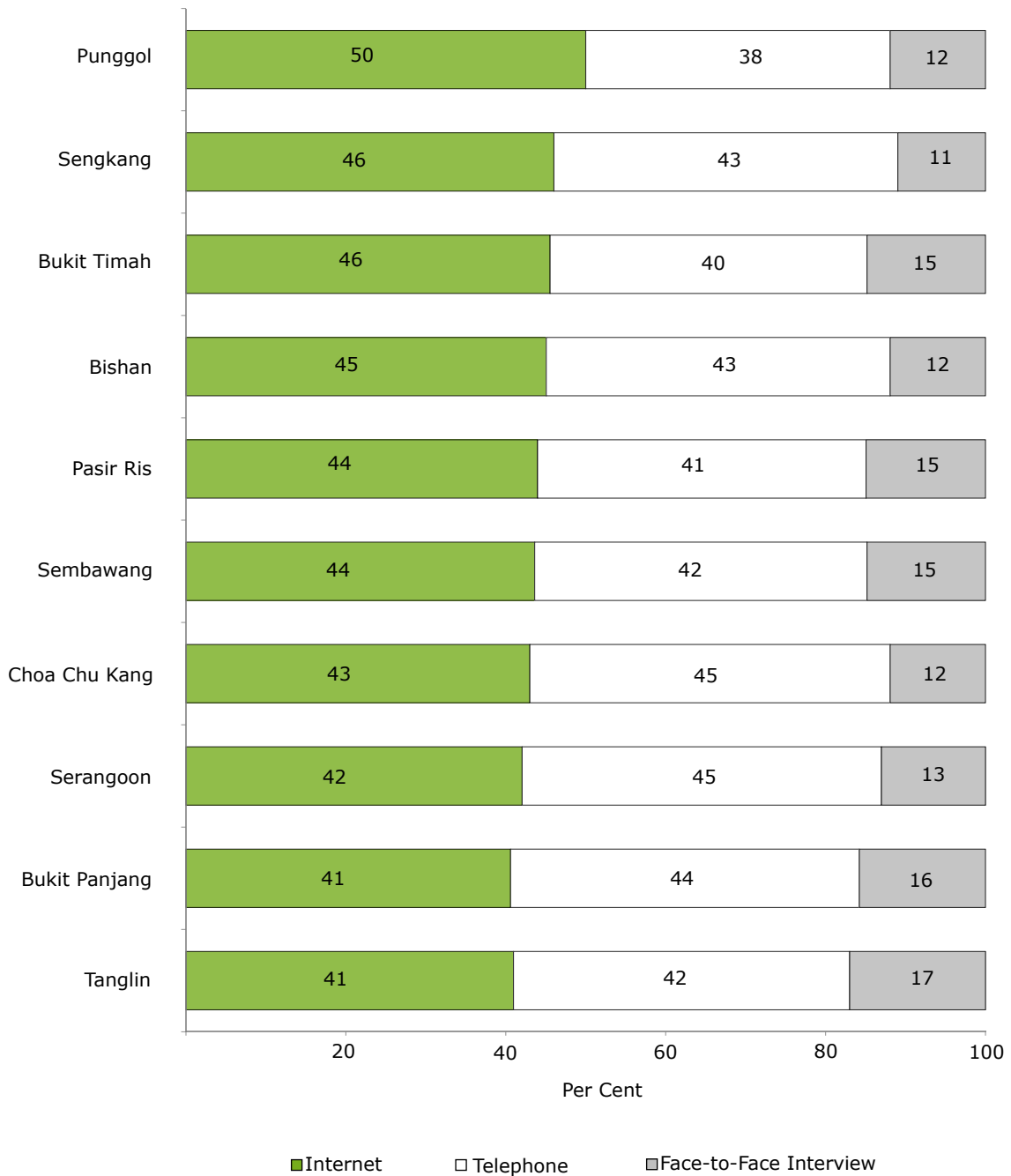


Internet Submission More Popular among Households in Younger Estates

Punggol had the highest proportion of Internet submissions (50 per cent)

made by households among all planning areas¹ covered for Census 2010 (Chart 4). This was followed by Sengkang and Bukit Timah at 46 per cent each.

CHART 4 TOP 10 PLANNING AREAS RANKED BY USE OF INTERNET FOR SUBMISSION, 2010



¹ The geographical areas presented in this article refer to the planning areas for the physical development of Singapore as demarcated in the Urban Redevelopment Authority’s Master Plan 2008.

Usage Patterns of Respondents

Internet Responses Peak at Night

The peak period where respondents logged in to submit their census returns was between 8 pm to 12 midnight (Chart 5). One-third of the Internet sessions registered for Census 2010 occurred within this period while the rest were spread mainly between 9 am to 8 pm.

More Calls to Hotline in the Day

Some 52,100 calls were made to the Census 2010 hotline between March to

August 2010. These included calls from respondents to submit their census returns over the phone, as well as respondents who needed assistance while completing their returns over the Internet.

They also included calls from the public who have general enquiries relating to the Census 2010.

In contrast to the late night peak for respondents using the Internet, the hotline received the highest number of calls in the morning (Chart 6).

CHART 5 PROPORTION OF TOTAL SESSIONS LOGGED IN AT CENSUS INTERNET SUBMISSION WEBSITE BY HOUR OF THE DAY

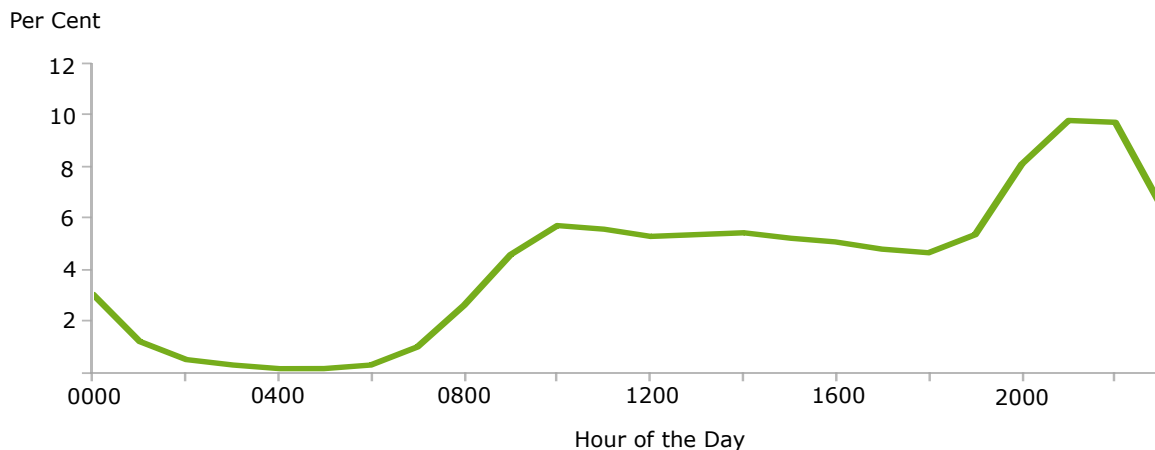
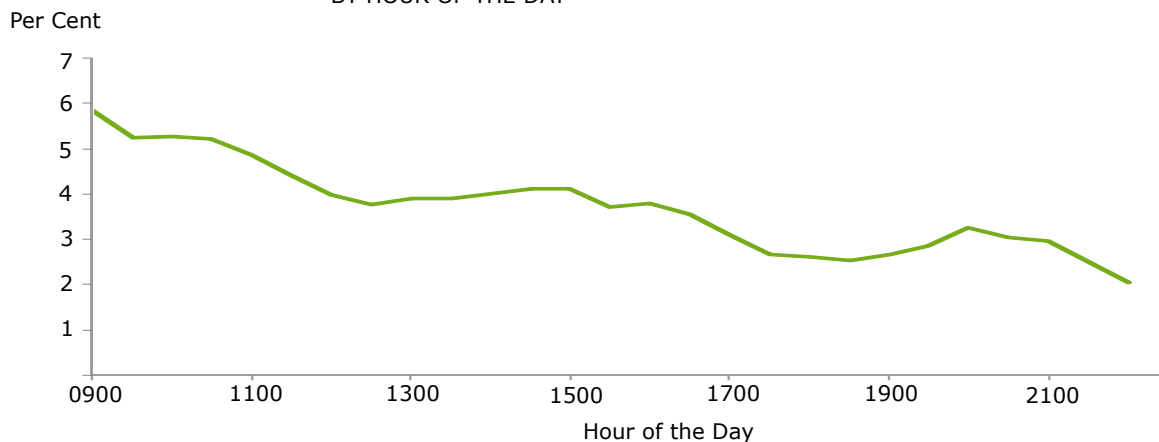


CHART 6 PROPORTION OF TOTAL CALLS RECEIVED BY CENSUS HOTLINE BY HOUR OF THE DAY



Concluding Remarks

The successful completion of the Census 2010 relied upon the support from the participating households.

With high Internet penetration rate and computer literacy in Singapore, households' acceptance of using the Internet as a mode to submit their census returns has grown over the years.

It is important nonetheless to note that respondents submitting their returns through telephone or face-to-face interviews still formed the majority of the Census 2010 returns.

The Department will continue to review the most appropriate mode(s) to administer household surveys taking into consideration the nature of the survey as well as the changing lifestyle of the population.

2010 in Brief

Singapore's population

... reached 5.08 million in June 2010.

Singapore's economy

... grew 14.5 per cent.

Mean years of schooling

... was 10.6 years for male resident non-students aged 25 years and over and
9.7 years for female resident non-students aged 25 years and over.

Home ownership rate

... was 87.2 per cent.

Per capital gross national income

... increased to S\$57,603.

Gross national saving

... was S\$139.8 billion.

Official foreign reserves

... increased to S\$289.0 billion.

Labour force participation rate

... reached 76.5 per cent among males and
56.5 per cent among females.

Resident unemployment rate (seasonally adjusted)

... was 3.2 per cent.

Inflation rate

... was 2.8 per cent.

Value added for the manufacturing sector

... amounted to S\$56.9 billion.

Investment commitments in manufacturing and services

... reached S\$12.9 billion.

Total trade

... reached S\$902.1 billion.

Visitor arrivals

... was 11,639 thousand.

Sea cargo handled

... reached 503 million tonnes.

Air cargo handled

... was 1,816 thousand tonnes.

Mobile phone subscribers

... reached 1,436 per 1,000 population.

Residential broadband subscribers

... increased to 440 per 1,000 population.

Crime rate

... declined to 650 per 100,000 population.

Rebasing of Retail Sales and Food & Beverage Services Indices

By

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Introduction

The Singapore Department of Statistics has recently completed the rebasing of the Retail Sales Index (RSI) and Food & Beverage Services Index¹ (FSI) to reference year 2010.

The RSI and FSI are rebased at regular intervals to reflect changes in the structure of retail trade and food & beverage (F&B) services industries. During the rebasing exercise, the methodology, coverage and weights are reviewed and updated.

This article presents an overview of the rebasing exercise and highlights the changes in the weighting patterns and trends of the 2005-based series compared with the 2010-based series.

What RSI and FSI Measure

The RSI and FSI measure the monthly movements in retail and F&B sales recorded by retail and F&B services establishments respectively. Retail establishments sell merchandise directly to the consumers while F&B services

establishments sell prepared food and drinks for in-premises consumption or on a take-away basis.

The RSI and FSI are presented at both current prices and constant prices. The indices at current prices measure the changes in sales values arising from changes in both price and quantity.

By removing the price effect, the indices at constant prices measure the changes in the volume of economic activity.

Sampling Methodology

The data used for the compilation of the RSI and FSI are primarily obtained from the Monthly Retail Sales Survey (RSS) and Monthly Food & Beverage Services Survey (FSS) conducted by the Department.

The establishments covered in RSS and FSS are selected based on stratified random sampling.

The sampling frame is obtained from the Department's Commercial Establishment Information System (CEIS). The sampling frame was first stratified by industry

1 Previously known as the Catering Trade Index (CTI).

groups; each industry group was then further stratified by size of operating receipts into three size strata (large, medium and small).

All establishments in the large size stratum were selected with certainty whereas the establishments in the medium and small size strata were subject to random sampling.

Within each industry group, the Lavallée-Hidiroglou (1988) algorithm was used to determine the size stratum boundaries as well as the optimal sample size for a required level of precision.

Comparison of Weighting Patterns in Old and New Series

The weight for each industry reflects its relative importance in the overall retail trade or F&B services sector.

The weights are computed based on the retail or F&B sales of the respective industries as obtained from the Annual Surveys of Retail Trade or F&B Services for reference year 2009.

Table 1 presents the old and new weights for RSI categories. The weights of "Department Stores", "Wearing Apparel

TABLE 1 Weighting Pattern of RSI in 2005-Based & 2010-Based Series

RSI Categories	2005=100	2010=100
Total	10,000	10,000
Department Stores	1,322	1,525
Supermarkets	411	453
Provision & Sundry Shops	536	475
Food & Beverages	200	201
Motor Vehicles	3,449	2,465
Petrol Service Stations	456	508
Medical Goods & Toiletries	332	415
Wearing Apparel & Footwear	574	746
Furniture & Household Equipment	755	817
Recreational Goods	190	184
Watches & Jewellery	607	770
Telecommunications Apparatus & Computers	366	556
Optical Goods & Books	344	367
Others	458	518

& Footwear”, “Watches & Jewellery” and “Telecommunications Apparatus & Computers” have increased from 29 per cent in the 2005-based series to 36 per cent in the 2010-based series.

In comparison, the share of “Motor Vehicles” has decreased from 34 per cent in 2005-based series to 25 per cent in 2010-based series.

Table 2 compares the old and new weights for FSI categories. The weights of “Restaurants” and “Other Eating Places”

have increased in the 2010-based series while the weights of “Fast Food Outlets” and “Food Caterers” have decreased during the same period.

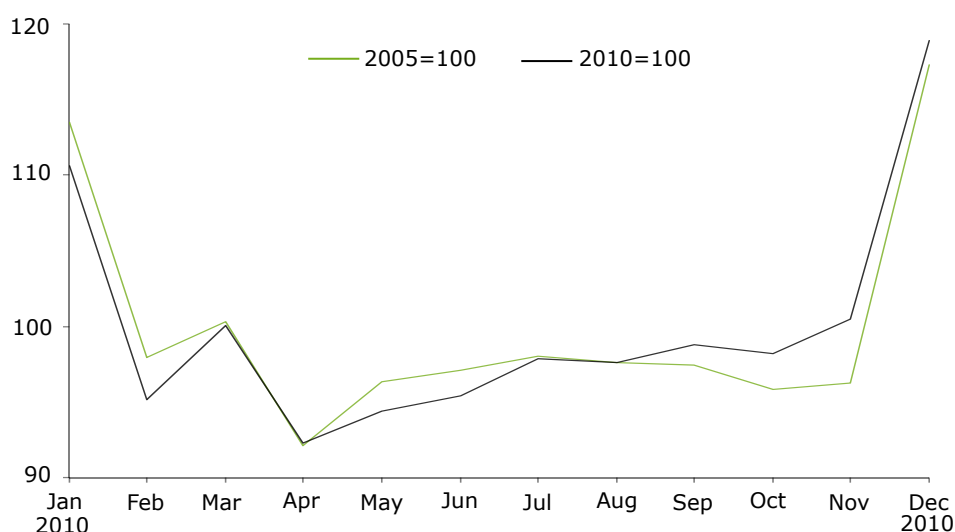
Comparison of Trends in Old and New Series

Chart 1 compares the overall RSI at current prices of the 2005-based and 2010-based series during January to December 2010. The old and new series exhibit similar trend. However, the new series shows lower turnover from January to

TABLE 2 Weighting Pattern of FSI in 2005-Based & 2010-Based Series

FSI Categories	2005=100	2010=100
Total	1,000	1,000
Restaurants	360	391
Fast Food Outlets	136	126
Food Caterers	148	114
Other Eating Places	356	369

CHART 1 RSI at Current Prices



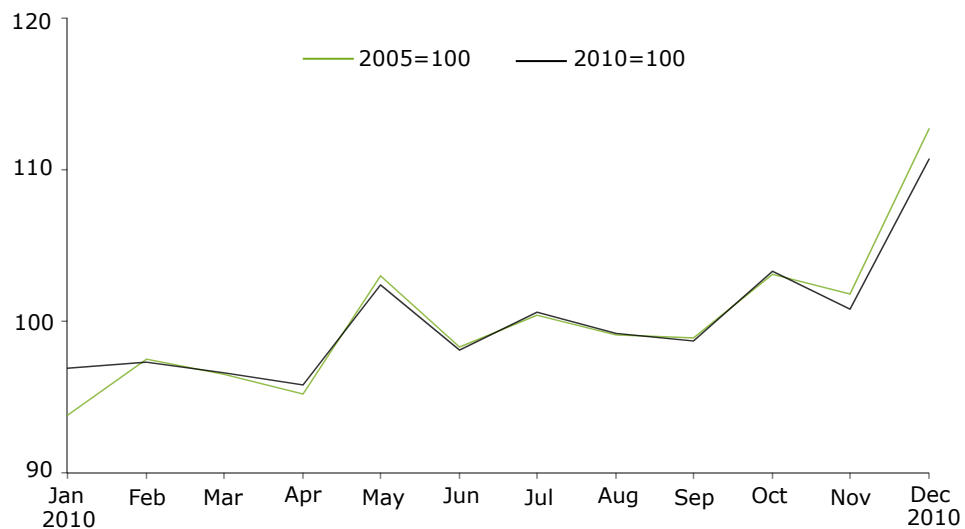
June 2010 and higher turnover from July to December 2010 compared to the old series.

Chart 2 shows the overall FSI for new series (base year 2010) and old series (base year 2005). The two series also present similar trend.

Conclusion

The RSI and FSI have been rebased to reference year 2010 with updated weighting patterns and improvements in coverage and methodology.

CHART 2 FSI at Current Prices



More information is available from the Information Paper on "Re-basing of the Retail Sales and Food & Beverage Services Indices (2010 = 100)". The paper is available for downloading from the SingStat website at:

<http://www.singstat.gov.sg/pubn/papers/economy/ip-b22.pdf>

The Lavallée-Hidiroglou (1988) algorithm has been used to improve the sampling efficiency for the Annual Survey of Services (AS). A discussion on the improvement in sampling design of the AS is available from the March 2008 issue of the Statistics Singapore Newsletter. Download the article on "Improving Sampling Efficiency for the Annual Survey of Services" via:

<http://www.singstat.gov.sg/pubn/ssn/archive/ssnmar2008.pdf>

Economic Survey Series 2009

The Singapore Department of Statistics conducts an annual survey on the services industries to collect a wide range of data for studies and analyses.

The latest survey was carried out in 2010 for reference year 2009.

The Economic Survey Series comprises several reports, which focus on several services industries of importance to the Singapore economy.

Key survey findings are released first on the SingStat website, followed by

softcopy publications with more detailed tabulations.

A final consolidated report on "The Services Sector" will provide a performance overview of the services sector in 2009.

Summary findings for selected services industries in 2009 are presented below.

Latest information on the results of the Economic Survey Series 2009 are accessible via the following weblinks:

Summary Findings

http://www.singstat.gov.sg/stats/themes/economy/biz/summary_findings_biz.html

Publications

<http://www.singstat.gov.sg/pubn/business.html>

Retail Trade

There were about 19,100 establishments engaging in the retail trade industry in 2009, employing some 114,900 workers. On a per establishment basis, there was an average of 6 workers.

Operating receipts of the retail trade industry declined by 5.9 per cent to \$38.2 billion in 2009, while operating surplus was maintained at \$2.2 billion. Total value added of the industry was \$4.9 billion, a decline of 1.9% over 2008.

Information & Communications Services

The Information & Communications services industry comprised some 6,100 establishments, which employed about 74,800 workers. This translated to an average of 12 workers per establishment.

Operating receipts generated by this industry grew 5.2 per cent to reach \$32.5 billion in 2009, while operating surplus rose 12.4 per cent to \$4.9 billion in 2009. Total value added of the industry was \$10.5 billion, up 9.2 per cent from 2008.

Transport & Storage Services

The transport & storage services industry comprised some 9,100 establishments, employing around 159,500 workers. On average, each establishment employed 18 workers.

Operating receipts generated by this industry was \$70.9 billion, 16.2 per cent lower compared with 2008. Operating surplus declined from \$15.8 billion in 2008 to \$11.0 billion in 2009. Total value added of the industry declined by 20.0 per cent to \$19.5 billion, due mainly to lower value added registered by water and air transport services in 2009.

Food & Beverage Services

There were about 6,000 establishments, employing some 86,800 workers in the food & beverage services industry. The average number of workers per establishment was around 14.

Operating receipts of this industry rose marginally by 0.7 per cent to \$5,609 million in 2009, as compared to 2008. The operating surplus was \$413 million, up 4.6 per cent from \$394 million in 2008. Total value added recorded by the industry was 1,934 million, close to 2008's level.

Health Services

The health services industry comprised some 4,100 establishments, which employed around 60,800 workers. On a per establishment basis, the average number of workers was 15.

Operating receipts for this industry rose 8.3 per cent from \$7,570 million in 2008 to \$8,197 million in 2009. The operating surplus was \$995 million in 2009, up 7.1 per cent from 2008. Total value added generated by the industry increased 7.3 per cent over 2008 to reach \$4,371 million in 2009.

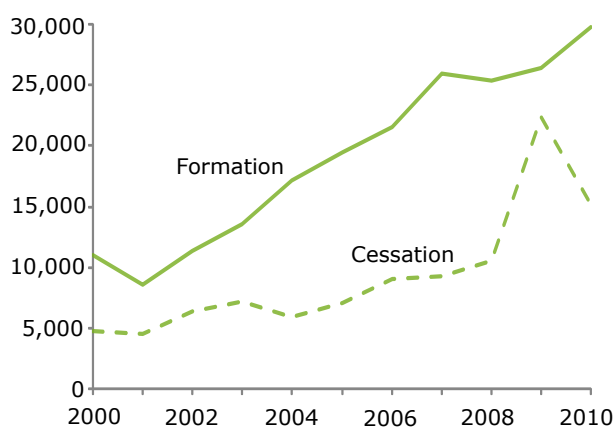
Formation and Cessation of Companies and Businesses, 2010

Companies

There were 29,800 company formations in 2010, 13 per cent higher than the 26,410 recorded in 2009. Growths in company formations were observed in almost all major industries, except for arts, entertainment, recreation & other services activities, which recorded a decline of 25 per cent. Significant increases in company formations were noted in the real estate (57 per cent), financial & insurance (42 per cent) and administrative & support services (27 per cent).

Some 15,120 companies ceased operations in 2010, as compared to 22,390 in 2009. The significant year-on-year decline of 33 per cent was attributed to a high base in 2009, due mainly to the Accounting and Corporate Regulatory Authority (ACRA) conducting a review of defunct companies and taking action to strike these companies off its register of companies during 2009.

CHART 1 FORMATION AND CESSATION OF COMPANIES

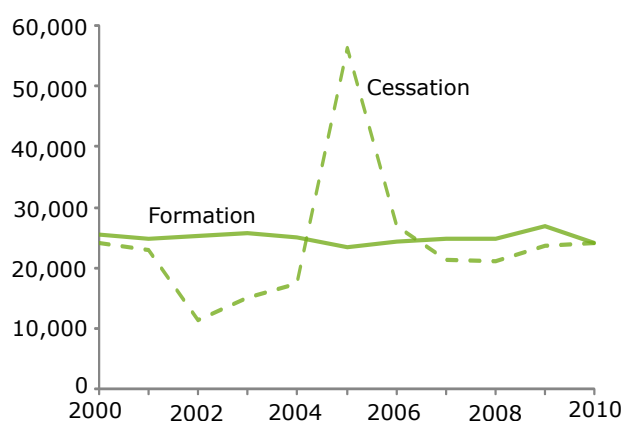


Businesses

The number of business formations decreased 11 per cent, from 26,880 in 2009 to 23,980 in 2010. Only the financial & insurance industry recorded an increase of 4.9 per cent in business formations. All other major industries registered a lower number of businesses set up, for example real estate (36 per cent), professional, scientific & technical activities (25 per cent), arts, entertainment, recreation & other services activities (11 per cent) and wholesale & retail (10 per cent) industries.

Business cessations increased 2.1 per cent in 2010 to reach 24,050. More businesses ceased operations in industries such as real estate (29 per cent), financial & insurance (23 per cent) and information & communications (10 per cent). Lower business cessations were recorded in the manufacturing (1.5 per cent) and wholesale & retail (1.1 per cent) industries.

CHART 2 FORMATION AND CESSATION OF BUSINESSES



Overseas Visitors

The Singapore Department of Statistics welcomed visitors from Brunei Darussalam and China over the past six months. The visits provided an excellent platform for professional exchanges and sharing.

Topics discussed included Singapore's register-based census approach, the planning and conduct of the Census of Population 2010 (C2010), the data collection, processing, dissemination and publicity strategies for C2010.

Overview of business surveys conducted on the Services Sector, the objective of the surveys, scope, sampling methodology, data items collected and statistics compiled were also presented.

Brunei Darussalam

A 7-member delegation from the Department of Economic Planning and Development led by Permanent Secretary at the Prime Minister's Office, Mr Dato Paduka Hj Murni Hj Mohamed, visited DOS in November 2010. The members of the delegation included:

- Mrs Hjh Mariah Hj Yahya
Assistant Director of Statistics
- Mr Hairol Nizam Hj Abd Hamid
Acting Assistant Director of Statistics

China

20 senior officials from the Statistics Bureau of Guangdong Province, led by the Deputy Director-General, Mr Liu Yong Cheng, visited DOS in December 2010. They included the following Division Chiefs:

- Mr Yan Fan
- Mr Li Zhu Qiao
- Mr Qang Guo Xin
- Mr Chen Xin

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It aims to provide readers with news of recent research and survey findings. It also serves as a vehicle to inform readers of the latest statistical activities in the Singapore statistical service.


Contributions and comments from readers are welcomed.


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Results from the Census of Population 2010 showed:

There were **3.8 million** Singapore residents.  For every 1,000 females, there

were **974** males.  The median age of Singapore residents was **37.4 years.**

There were **1.1 million** resident households.  The average household size



was **3.5 persons.** Almost **1 in 3** resident households stayed in HDB 4-room flats.



The median monthly household income from work reached **\$5,000.**



More Information on the key trends in population size, growth, demographic profile and broad geographic distribution of the Singapore population are available from the Advance Census Release and a series of 3 Statistical Releases.

-  [Advance Census Release](#)
-  [Statistical Release 1: Demographic Characteristics, Education, Language and Religion](#)
-  [Statistical Release 2: Households and Housing](#)
-  [Statistical Release 3: Geographic Distribution and Transport](#)

Download softcopies of these reports at
<http://www.singstat.gov.sg/pubn/census2010.html>

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