Legislative Council Panel on Housing

Third Rent Review for Public Rental Housing

PURPOSE

This paper briefs Members on the outcome of the third rent review conducted under the established rent adjustment mechanism for public rental housing (PRH).

BACKGROUND

2.   Section 16A of the Housing Ordinance (Cap. 283), which stipulates the rent adjustment mechanism for PRH, came into effect on 1 January 2008. Section 16A provides that the Housing Authority (HA) shall conduct a rent review every two years[1] and vary the PRH rent according to the change in the income index between the first and second periods covered by the review. Section 16A(4) provides that the HA, "if satisfied on a review of the relevant rent that the income index for the second period is higher than the income index for the first period by more than 0.1%, shall as soon as practicable after the review increase the relevant rent by the rate of the increase of the income index or 10%, whichever is less"; and "if satisfied on a review of the relevant rent that the income index for the second period is lower than the income index for the first period by more than 0.1%, shall as soon as practicable after the review reduce the relevant rent by the rate of reduction of the income index". The mechanism provides an objective basis for the HA to determine when PRH rent should be adjusted and by how much, taking into account tenants' affordability. It also helps promote the long-term sustainability of the PRH programme. Background information on the rent adjustment mechanism, as well as the methodology for data collection and computation is at **Annex A**. The first rent review exercise under this current rent adjustment mechanism was conducted in 2010[2]. The Subsidised Housing Committee (SHC) of the HA considered the report of the Commissioner for Census and Statistics (C for C&S) and endorsed the outcome of the first rent review whereby the change in the

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[1] Section 16A(1)(b) of the Housing Ordinance stipulates that the HA "shall review the relevant rent as soon as practicable after the second anniversary of the expiry date of the second period for the last review".

[2] Section 16A(1)(a) of the Housing Ordinance stipulates that the HA shall "review the relevant rent as soon as practicable after 1 January 2010". In relation to the first rent review to be conducted after 1 January 2010, section 16A(8) of the Housing Ordinance defines the first period as a period of 12 months expiring on 31 December 2007, and the second period as a period of 12 months expiring on 31 December 2009.

income index of the first and second periods (respectively the 12 months in 2007 and 2009) was +4.68%. PRH rent was accordingly increased by 4.68% in September 2010. The second PRH rent review was conducted in 2012. In the second rent review, the change in income index between the first (2009) and the second (2011) period was +16.24%. The SHC endorsed the outcome of the review and raised PRH rent by 10% with effect from September 2012.

OUTCOME OF THE THIRD PRH RENT REVIEW

3. For the third review the first period is the 12 months in 2011, and the second period is the 12 months in 2013. The Census & Statistics Department (C&SD) has confirmed that the survey data accurately reflect the household income of PRH tenants in both 2011 and 2013. The survey data have accordingly been used to compute the income index for PRH tenants. Distribution of survey data and details of households excluded from the computation of the mean monthly household income are set out in the ensuing paragraphs.

Sample Distribution

4. Monthly sampling of 2 000 PRH households for the first and second periods was conducted in accordance with the actual distribution of household size each month as shown in **Annex B1** and **Annex B2** respectively.

5. By design of the proportionate stratified systematic sampling, the distribution of tenant household sample by PRH estate and by district corresponds to the actual distribution for all PRH households. A comparison of the tenant household sample and actual distribution of households by district and by estate for the first and second periods is at **Annex C1** and **Annex C2** respectively.

Exclusion of Non-representative Households

6. A total of 24 000 PRH households were sampled in each of the first and second periods, hence the third rent review involved income data collected from a total of 48 000 PRH households. Among these 48 000 households, the response rate stood at 98.2% and 98.4% respectively. The remaining 2% involved 440 cases and 390 cases for 2011 and 2013 respectively. These tenants were unable to provide all the information requested in the declaration form, and all were verified by the Housing Department (HD) to have reasonable grounds (such as chronic illness, overseas employment or study, imprisonment, etc).

7.   According to the methodology as spelt out in Annex A, in the 2011 Income Survey, 881 "well-off tenants"[3], 543 other households with income higher than the upper outlying levels, and 5 507 Comprehensive Social Security Assistance (CSSA) households were excluded from the computation of the income index, accounting for 3.8%, 2.3% and 23.5% of the completed sample respectively.   Upon exclusion of the three categories of non-representative households and 118 invalid sampling units (i.e. deceased tenants and those who terminated their tenancies), the resulting sample size is 16 951 for 2011.

8.   As for 2013, 728 "well-off tenants", 466 other households with income higher than the upper outlying levels, and 5 000 CSSA households are excluded from the computation of the income index, accounting for 3.1%, 2.0% and 21.3% of the completed sample respectively.   Upon exclusion of the three categories of non-representative households and 126 invalid sampling units, the resulting sample size is 17 680 for 2013.   The C&SD considers the resultant sample sizes for both the first and second periods form a sound basis for the compilation of the income index.

Computation of Mean Monthly Household Income

9.   Applying a standard statistical method to gross up the survey data above, the C&SD computed the household size distribution of PRH tenants which forms a set of weights for computing the overall mean monthly household income and hence the income index for the rent review.   Details for the two periods are at **Annex D1** and **Annex D2** respectively.

10.   The mean monthly household income of PRH tenants in the first period (i.e. 2011) is $15,473 and this index is set at 100.   The adjusted mean monthly household income in the second period (i.e. 2013) is $18,455.   The index of the second period is therefore 119.27.   The C&SD has conducted various quality checks and computed the income index with reference to the income data for the first and second periods in its independent capacity. Findings of the quality checks performed by the C&SD and the computation of

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[3] The HA's Housing Subsidy Policy (HSP) and the Policy on Safeguarding Rational Allocation of Public Housing Resources (SRA) are commonly referred to as the "Well-off Tenants Policies".   Under the "Well-off Tenants Policies", households after living in PRH for ten years are required to declare their household income, and thereafter biennially.   Those with a household income exceeding the prescribed income limits have to pay 1.5 times or double net rent plus rates as appropriate.   PRH households with total household income and net assets value both exceeding the prescribed income and asset limits are required to vacate their PRH flats. Households who are required to vacate their PRH flats but have a temporary housing need may apply for a fixed-term licence to stay in the PRH for a period of not more than 12 months, during which time a licence fee equivalent to the double net rent plus rates or market rent, whichever is the higher, is charged.   "Well-off tenants" are PRH tenants who are paying additional rent (i.e. 1.5 times or double net rent plus rates, or market rent).

income index are appended at the C for C&S' report on the third rent review exercise at **Annex E**.

11.　　As mentioned in paragraph 2 above, section 16A(4)(a) of the Housing Ordinance stipulates that if the income index for the second period is higher than that for the first period by more than 0.1%, the HA shall increase the PRH rent by the rate of increase of the income index or 10%, whichever is less.　Since the income index for the second period is **higher** than that for the first period **by 19.27%**, rent adjustment under the third PRH rent review is **+10%**.

IMPACT ON PRH TENANTS

12.　　Among a total of about 721 300 households residing in PRH as at December 2013, there were about 136 800 (or 19%) CSSA households.　The remainder consisted of about 550 700 households (or 76%) who were paying normal rent; about 12 200 households (or 2%) receiving assistance under the HA's Rent Assistance Scheme (RAS) and paying either 50% or 75% of the normal rent; and about 21 500 "well-off tenants" (or 3%) who were paying additional rent.

13.　　The average monthly rent as at December 2013 was $1,540.　An adjustment of +10% means **an increase of $154 on average**.　On the other hand, the range of rent as at December 2013 was from $287 to $3,877.　Therefore, the upward rent adjustment will **range from $28 to $387 as tabulated below –**

Monthly Rent Increase	No. of Households[1]	Percentage among all PRH households[2]
+$28 to $50	5 100	1%
+$51 to $100	88 200	15%
+$101 to $150	218 900	37%
+$151 to $200	127 100	22%
+$201 to $250	87 500	15%
+$251 to $387	57 700	10%

Notes:

1.　Figures rounded to the nearest hundred.

2.　The total may not add up to 100% due to rounding.

HOUSING AUTHORITY'S DISCUSSION

14.   On 4 July 2014, the SHC of the HA considered the report of the C for C&S.   The SHC endorsed the outcome of the third rent review exercise and approved a 10% increase in PRH rent in accordance with the Housing Ordinance.   Members further noted that the HA should effect the rent increase as soon as practicable in accordance with section 16A(4) of the Housing Ordinance.   In this connection, section 16A(5)(b) of the Housing Ordinance stipulates that the HA shall not vary the relevant rent before the second anniversary of the date of the last variation.   The last adjustment of PRH rent under the established mechanism came into effect on 1 September 2012.   This means that the PRH rent increase of 10% will come into effect on 1 September 2014.   PRH tenants will be notified one month in advance of their new rent levels.

15.   In considering the impact of rent increase on our tenants, the SHC has noted the following –

(a)   according to C for C&S, our tenants' mean household income has increased in the past two years from $15,473 to $18,455, by 19.27% or $2,982, as compared to the rent increase of $154 on average, with a range of $28 to $387;

(b)   as a result of the design of the rent adjustment mechanism, over the years tenants' household income has increased more than rent. From 2009 to 2011, the increase in household income was 16.24% but rent was only raised by 10%.   From 2011 to 2013, the household income has increased by 19.27% but again, the rent will only increase by 10%;

(c)   based on our data as at end-December 2013, 3% of our tenants are "well-off tenants" and should be able to afford the rent increase, and another 19% are CSSA recipients.   In addition, 2% of our tenants who are facing temporary financial difficulties currently receive rental assistance under our RAS.   Details of the scheme are at **Annex F**;

(d)   the government has proposed, as a Budget measure, to pay one month's rent for PRH tenants.   If this is approved by the Legislative Council, it would almost offset the effect of the first year of the new rent from September 2014; and

(e) in the first and second rent reviews, the HA granted one-month rent waivers on grounds of the special circumstances at that time. Given the current economic situation and the growth in tenants' income, it is arguable if there are clear grounds for the HA to again grant a rent waiver this time.

16. On the question of whether to grant rent waiver, apart from the above considerations the SHC also noted the financial implications stated below, whichare based on the budget approved by the HA in January 2014 –

	2014-15	**2017-18**

1. Rental housing operating deficit
  (a) in the January 2014 budget
  (b) after 10% rent increase
  (c) plus 1 month waiver
	$1.7 billion
	$0.9 billion
	$2.1 billion
		$3.8 billion
		$2.4 billion
		$2.4 billion[4]

2. Monthly operating deficit
  per PRH unit
  (a) in the January 2014 budget
  (b) after 10% rent increase
  (c) plus 1 month waiver
	$180
	$90
	$230
		$400
		$250
		$250[4]

In other words, according to the budget approved by the HA in January 2014, the deficit of the rental housing operating account is expected to increase from about $1.7 billion in 2014-15 to about $3.8 billion in 2017-18. The monthly operating deficit for each PRH unit is expected to widen from about $180 in 2014-15 to about $400 in 2017-18. In light of the 10% increase in PRH rent in September 2014, the deficit of the rental housing operating account is expected to shrink to about $0.9 billion in 2014-15 and to about $2.4 billion in 2017-18 respectively. However, if the HA were to provide a one-month rent waiver while adjusting the rent upwards by 10% in September 2014, we estimate that the deficit of the rental housing 2014-15 operating account will increase to about $2.1 billion. The average monthly operating deficit for each PRH unit in 2014-15 is also estimated to swell from about $180 to about $230. This is because one-month's rent will amount to about $1.2 billion, while due to the 10% upward rent adjustment in September 2014, the extra rent received by the HA in 2014-15 will only be around $0.8 billion.

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[4] Since the rent waiver, if implemented, is a one-off measure in 2014-15, it has no effect on the rental housing operating account in 2015-16 and afterwards.

17.	The SHC also noted that section 4(4) of the Housing Ordinance stipulates that "The policy of the HA shall be directed to ensuring that the revenue accruing to it from its estates shall be sufficient to meet its recurrent expenditure on its estates." Granting a rent waiver to all tenants irrespective of whether tenants are in need may not be the best use of HA's revenue. It may also not be the most equitable, when there is a growing demand on HA's resources from citizens who are waiting for their PRH units. Instead, the SHC considered that there should be targeted assistance to those tenants who are in need, such as by enhancing the RAS.

18.	Members are invited to note the outcome of the third rent review exercise in accordance with section 16A(4) of the Housing Ordinance and the deliberations by the SHC.

Housing Department
July 2014

Background and methodology of the
Rent Adjustment Mechanism

A. Background leading to the establishment of the current rent adjustment mechanism

It has been a long-established policy for the HA to set the PRH rent at affordable levels.   At the same time, under section 4(4) of the Housing Ordinance, the policy of the HA shall be directed to ensuring that the revenue accruing to it from its estates shall be sufficient to meet its recurrent expenditure on its estates.

2.   Prior to 1998, the HA used to review and adjust the rent of PRH units in batches biennially.   Each batch comprised different number of units in different locations.   In determining whether, and if so the extent to which, PRH rent should be adjusted, the HA would take into account a number of factors, including tenants' affordability, consumer price movements, Government rates, wage movement, comparative estate values, running costs of the estates under review, the HA's financial conditions, etc.   In 1997, the Housing Ordinance was amended by way of a Private Members' Bill.   The amended Ordinance came into effect in March 1998.   The then section 16(1A) of the Housing Ordinance imposed, inter alia, the requirement of the median rent-to-income ratio (MRIR) of all estates not exceeding 10% after any rent variation.   The requirement did not provide an objective basis for the HA to consider any rent adjustment, since increases in MRIR could be brought about by extraneous factors other than changes in PRH tenants' household income, such as an increase in the proportion of small households, elderly households or CSSA households, and improvement in the PRH allocation standard.   There was thus a need to establish an objective and sustainable mechanism to form the basis for rent adjustments.

3.   The HA set up an Ad Hoc Committee in January 2001 to review its domestic rent policy.   The objective of the review is to map out a rent policy that is affordable and flexible, provides greater choice to tenants, and contributes to the long-term sustainability of the public housing programme. In November 2006, the HA approved the Report on the Review of Domestic Rent Policy, which recommended the formulation of the income-based rent adjustment mechanism to replace the previous statutory 10% MRIR cap.

B. The Current Mechanism

4.   The Housing (Amendment) Bill 2007 (the Amendment Bill) introduced the current mechanism to provide for upward or downward adjustment of PRH rent according to the changes in the household income of PRH tenants.   The Amendment Bill was passed by the Legislative Council in June 2007 and came into operation on 1 January 2008.   To provide a starting point for the rent adjustment mechanism to operate effectively, the HA reduced the PRH rent by 11.6% from August 2007[1].

5.   Under the current PRH rent adjustment mechanism, the HA shall conduct a rent review every two years and vary the PRH rent according to the change in the income index between the first and second periods covered by the review.   As stipulated in section 16A(4) of the Housing Ordinance, if the income index for the second period is higher than that for the first period by more than 0.1%, the HA shall increase the PRH rent by the rate of increase of the income index or 10%, whichever is less.   If the income index for the second period is lower than that for the first period by more than 0.1%, the HA shall reduce the PRH rent by the rate of reduction of the income index.

6.   Rent adjustments are made with reference to the change in the income index between the first and second periods of the rent review cycle.   In accordance with section 16A(8) of the Housing Ordinance, for the third rent review, the first period is the period of 12 months expiring on 31 December 2011, and the second period is the period of 12 months expiring on 31 December 2013.   Under section 16A(7)(a), an income index for the first period reflects the level of the mean monthly household income of tenants over the first period and an income index for the second period reflects the level of the adjusted mean monthly household income of tenants over the second period. As stipulated in Section 16A(8), "adjusted mean monthly household income" means the mean monthly income of tenants assessed on the basis of the distribution of the household size of those tenants over the first period.

7.   Section 16A(7)(b) of the Housing Ordinance specifies that the C for C&S shall, in relation to the compilation of the income index, compute the index.   This includes the computation of the change in the income index between the first and second periods.

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[1] In 2006, the Hong Kong Housing Authority Ad Hoc Committee on Review of Domestic Rent Policy considered that for the income-based rent adjustment mechanism to operate effectively and fairly, the then PRH rent should be adjusted to a level considered appropriate and acceptable to the community.   Since the level of PRH rent had remained unchanged from 1997 to 2006, a comparison of the income index of PRH tenants in the two periods of January – December 1997 and April 2005 - March 2006 was made, and the corresponding decrease in income of 11.6% was adopted as the basis for the rent reduction.

C. Data Collection and Computation

8.　　　　Compilation of the income index involves both "data collection" and "data computation".　The income data of PRH households collected through the "Survey on Household Income of Public Rental Housing Tenants" (the Income Survey) is used as the basis for compiling the income index.

9.　　　　To collect the income data, a sample of 2 000 PRH households is randomly selected by the HA each month and each sampled household receives a notification letter together with an income declaration form.　The income declaration forms are served under section 25(1) of the Housing Ordinance and declaration is mandatory.　The declarable income includes remuneration from employment and self-employment, and other income (for example, interest and dividends).　All sampled households are required by law to complete the forms. However, to mitigate the burden caused to the sampled households, no household is selected more than once within a period of 12 months.

10.　　　　For each sampled household, every family member listed in the tenancy records shall, in compliance with the relevant stipulations of the Ordinance, declare truthfully their monthly income.　Explanatory notes are provided in the income declaration form to facilitate their provision of income data.　The sampled households shall return the duly completed income declaration forms within the time specified.　Information provided by tenants is treated in strict confidence and is solely used for compiling the income index. Households who knowingly make false statements of their particulars required in the income declaration forms, or refuse or fail to return the forms by the specified time, shall be guilty of an offence and will be liable to prosecution.

11.　　　　The compilation of the income index serves to assess the "pure income change" in the household income of PRH tenants during the rent review cycle with a view to determining the extent of rent adjustment.　To do this, the household size distribution of PRH tenants in the rent review cycle should remain unchanged, so that the impact on household income due to variations of household size distribution could be eliminated in computing the income index.

The role of the HA

12.　　　　The HA collects the income data from the sampled households. The sampling method and the data collection process were devised in consultation with the C&SD to ensure the representativeness and accuracy of the Income Survey.

13.		As far as sampling is concerned, a probability-based sampling method is adopted to randomly select 2 000 PRH tenants each month to participate in the Income Survey. PRH tenants are first categorized into five household size categories (i.e. five strata): 1-person households, 2-person households, 3-person households, 4-person households and households of 5 persons or above. Households are then drawn from each category according to the actual household size distribution of PRH tenants in a particular month. 2 000 households were sampled according to the actual household size distribution month by month. This method is known as **proportionate stratified random sampling**. It provides more precise estimates than the simple random sampling.

14.		In the course of data collection and processing, the HA has adopted the following measures to safeguard the quality of data collected in the Income Survey -

> (a)	the HA responds to tenants' enquiries regarding any problems they encounter when completing the income declaration forms so as to minimise errors and omissions. Home visits are also conducted by the HA staff upon request to assist physically challenged tenants and the elderly to complete the forms;

> (b)	the HA has carried out preliminary vetting of all the returned income declaration forms upon receipt from the sampled households. For those forms which were not duly completed or in need of further clarification, the households concerned were contacted by the staff of the HD, and may be asked to provide documentary proof of income and other related information for verification of the declared income data;

> (c)	the HA has adopted a double data entry approach, i.e. the same set of data is input into the computer by two staff members separately. The two sets of data are then compared and matched with each other for verification to avoid manual input errors; and

> (d)	the HA has conducted computerized validation check on the input data of the Income Survey. Any discrepancies identified were verified with the sampled households concerned before providing the dataset to the C&SD for computing the income index.

The role of C&SD

15.   The C&SD is responsible for conducting quality checks on the work of the HA in the Income Survey; and computing the income index in its independent capacity in accordance with section 16A(7)(b) of the Housing Ordinance.

a. Quality check on the work of the HA in the Income Survey

16.   The C&SD has adopted various quality checks to ensure the impartiality, objectiveness and accuracy of the HA's work in the Income Survey. These measures serve to monitor and assess in a comprehensive manner the representativeness of the sampled PRH households, the correctness of the declared income and the accuracy of the input data. The objective is to ensure that the data adopted for the computation of the income index could truly reflect the household income of PRH tenants. These measures include -

  (a) statistical testing is conducted by the C&SD to evaluate if the distribution of the sampled households is in line with the actual distribution of PRH tenants in terms of household size and geographical distribution, so as to ensure the representativeness of the samples;

  (b) about 5% of the sampled households who have declared income are randomly selected by the C&SD for the HA to request them to submit income documentary proof to support that the information declared is true and correct. Some 1 200 households annually are covered by this additional verification. Furthermore, the C&SD conducts random check to confirm whether the HA has vetted the income documentary proof properly;

  (c) about 2% of the completed income declaration forms are randomly selected by the C&SD each month to check the accuracy of data input performed by the HA; and

  (d) the C&SD carries out another round of checking on the HA's data validation work as mentioned in paragraph 14(d) above to ensure that all necessary steps were taken.

b. Exclusion of Non-representative Households

17.	The income index seeks to reflect changes in the household income of PRH tenants over the first and second periods. In computing the income index, "non-representative" households with considerable income deviation are excluded, in accordance with the methodology noted by the Bills Committee scrutinizing the Amendment Bill mentioned in paragraph 4 above, to minimise distortion to the outcome of the computation. Households excluded from computation of the income index are -

(a)	*"Well-off tenants"*: Tenants paying additional rent (commonly known as "well-off tenants") are better off than other PRH households. Their inclusion in the coverage of the income index would raise the overall income level and hence cannot accurately reflect the affordability of PRH households in general;

(b)	*Other households with high "outlying" income*: Referring to those high-income households who are not "well-off tenants" paying additional rent (including those who have resided in PRH for less than 10 years). To assess the proportion of these households, the "John Tukey's Outliers Filter" method, a common statistical method, has been adopted for the treatment of outliers' data. Applying this method to define the outliers of the income data in the Income Survey has excluded PRH households with income higher than the upper outlying levels (please see **Appendix** on the methodology); and

(c)	*CSSA households*: The level of CSSA is set by the Government. It does not reflect the income level of representative PRH tenant households.

c. Computation of Mean Monthly Household Income

18.	With the exclusion of the three categories of non-representative PRH households and invalid sampling units, as well as the application of statistical method to gross up the survey data, the C&SD computes the household size distribution of PRH tenants which forms a set of weights for computing the overall mean monthly household income and hence the income index for the rent review.

19.　　　　　The distribution in the first period forms the set of weights which remains unchanged over the second period. In statistical term, the mean monthly household income of the second period is 'adjusted' based on the household size distribution of the first period in order to discount the impact on household income due to variation in household size distribution in the rent review cycle.

The John Tukey's Outliers Filter Method

Background

The "Report on the Review of Domestic Rent Policy" published by the HA in end 2006 proposed to exclude CSSA and additional rent paying households from the coverage of the income index. It further suggested households with extreme income in each household size category be excluded from the calculation of the index to deal with the so-called "outliers".

2. At the third Bills Committee (which scrutinised the Housing (Amendment) Bill 2007) meeting held on 16 March 2007, Members raised concerns about the potential distortion to the resultant rate of rent adjustment under the new rent adjustment mechanism by high income households. The Administration responded that, in addition to CSSA households and additional rent-paying households, the approximate top 1% household income in each household size group would also be excluded when calculating the weighted average household income.

3. The idea of excluding households with extremely high income was further discussed in subsequent Bills Committee meetings. While Members were aware of the Administration's suggestion, some Members were of the view that more stringent selection rules should be applied so that "mild outliers" would also be excluded.

4. Upon further consultation with the C&SD, the Administration proposed to adopt the John Tukey's Outliers Filter Method to assess the proportion of households with outlying income levels. Based on the income pattern of PRH tenants back then, it was estimated that about top 4% and 5% households in each household size group would be excluded by applying the John Tukey's Outliers Filter Method. The suggested methodology was noted by the Bills Committee.

The Method

5. John Tukey's Outliers Filter Method was developed by John Wilder Tukey (1915-2000). This is a common and widely accepted statistical method for detecting outliers as it is applicable to different types of data set, without any

assumptions on the statistical distribution or pattern of the data set.

6. The method determines the upper and lower outlier levels, based on the distribution of the whole set of original data. Those data higher than the upper level and those lower than the lower level are classified as outliers. As the two levels are determined from the original data set, there is no pre-determined percentage of data which will be classified as outliers.

7. In the context of compilation of the Income Index, the actual calculation involves -

(a) arranging the set of household income data from the survey in ascending order, i.e. from the lowest to the highest income.

(b) calculating the median, upper quartile or 75th percentile ($x_{.75}$) and lower quartile or 25th percentile ($x_{.25}$) of the household income of the sampled households. The median is the income level which divides the sampled households into two equal halves, one with household income above the median and the other below the median. The upper quartile is the income level which is above 75% of the sampled households. In other words, 25% of the sampled households have income above the upper quartile. Similarly, the lower quartile is the income level above 25% of the sampled households.

(c) calculating the interquartile range (IQR) by subtracting the lower quartile from the upper quartile, i.e. IQR = $x_{.75}$-$x_{.25}$. The IQR thus contains the middle 50% of sampled households in terms of household income.

(d) the upper outlying level is determined as 1.5×IQR higher than the upper quartile, i.e. $x_{.75}$ + 1.5 x IQR

Any household with income <u>higher than</u> this level is considered an outlier.

(e) the lower outlying level is determined as 1.5×IQR lower than the lower quartile. i.e. $x_{.25}$ - 1.5 x IQR

Any household with income <u>lower than</u> this level is considered an outlier.

8. An example of the calculation for 1-person household group in 2011

is set out below -

Minimum ($)	Maximum ($)	Lower quartile (25th percentile) ($)	Upper quartile (75th percentile) ($)	Interquartile range (IQR) ($)
0	50,000	3,000	6,482	3,482

The interquartile range (IQR) = upper quartile – lower quartile
= 6,482 – 3,000
= 3,482

The upper outlying level = upper quartile + 1.5 x IQR
= 6,482 + 1.5 × 3,482
= 11,705

The lower outlying level = lower quartile – 1.5 x IQR
= 3,000 – 1.5 x 3,482
= – 2,223

Similarly, upper and lower outlying levels for other household sizes can be computed.   The results for 2011 are listed below -

Household size	Lower outlying level ($)	Upper outlying level ($)
1-person	– 2,223	11,705
2-person	– 5,382	24,602
3-person	– 8,400	39,440
4-person	– 9,480	49,400
5-person or above	– 11,391	59,398

As for the 2013 data, the upper and lower outlying levels for determining the outliers are listed below -

Household size	Lower outlying level ($)	Upper outlying level ($)
1-person	– 2,170	12,950
2-person	– 6,662	29,447
3-person	– 8,615	45,518
4-person	– 10,283	57,642
5-person or above	– 11,695	69,897

Households with income exceeding the upper outlying level or less than the lower outlying level are considered as outliers.   In reality, there is no household with negative income.   Therefore, no household from the lower end of the actual income distribution is considered as outlier and excluded.

Sample Distribution by Household Size in the First Period (2011)

Month of Declaration in 2011		Household Size					
		1P	2P	3P	4P	5P or above	Total
January	No. of Household	339	469	508	455	229	2 000
	%	(17.0)	(23.5)	(25.4)	(22.8)	(11.5)	(100.0)
February	No. of Household	340	470	508	454	228	2 000
	%	(17.0)	(23.5)	(25.4)	(22.7)	(11.4)	(100.0)
March	No. of Household	340	471	508	453	228	2 000
	%	(17.0)	(23.6)	(25.4)	(22.7)	(11.4)	(100.0)
April	No. of Household	341	472	508	453	226	2 000
	%	(17.1)	(23.6)	(25.4)	(22.7)	(11.3)	(100.0)
May	No. of Household	341	473	508	452	226	2 000
	%	(17.1)	(23.7)	(25.4)	(22.6)	(11.3)	(100.0)
June	No. of Household	342	475	508	451	224	2 000
	%	(17.1)	(23.8)	(25.4)	(22.6)	(11.2)	(100.0)
July	No. of Household	343	477	509	449	222	2 000
	%	(17.2)	(23.9)	(25.5)	(22.5)	(11.1)	(100.0)
August	No. of Household	344	477	509	449	221	2 000
	%	(17.2)	(23.9)	(25.5)	(22.5)	(11.1)	(100.0)
September	No. of Household	345	477	509	448	221	2 000
	%	(17.3)	(23.9)	(25.5)	(22.4)	(11.1)	(100.0)
October	No. of Household	346	479	509	446	220	2 000
	%	(17.3)	(24.0)	(25.5)	(22.3)	(11.0)	(100.0)
November	No. of Household	345	481	509	446	219	2 000
	%	(17.3)	(24.1)	(25.5)	(22.3)	(11.0)	(100.0)
December	No. of Household	345	482	510	445	218	2 000
	%	(17.3)	(24.1)	(25.5)	(22.3)	(10.9)	(100.0)
Overall	**No. of Household**	**4 111**	**5 703**	**6 103**	**5 401**	**2 682**	**24 000**
	%	**(17.1)**	**(23.8)**	**(25.4)**	**(22.5)**	**(11.2)**	**(100.0)**

Households were sampled according to the actual distribution of PRH households by household size, which varies from month to month.   The percentages in brackets denote the distribution of sampled households in that month.

Sample Distribution by Household Size in the Second Period (2013)

Month of Declaration in 2013		Household Size					
		1P	2P	3P	4P	5P or above	Total
January	No. of Household	350	497	512	434	207	2 000
	%	(17.5)	(24.9)	(25.6)	(21.7)	(10.4)	(100.0)
February	No. of Household	350	498	512	433	207	2 000
	%	(17.5)	(24.9)	(25.6)	(21.7)	(10.4)	(100.0)
March	No. of Household	351	498	512	433	206	2 000
	%	(17.6)	(24.9)	(25.6)	(21.7)	(10.3)	(100.0)
April	No. of Household	352	499	512	432	205	2 000
	%	(17.6)	(25.0)	(25.6)	(21.6)	(10.3)	(100.0)
May	No. of Household	352	501	512	431	204	2 000
	%	(17.6)	(25.1)	(25.6)	(21.6)	(10.2)	(100.0)
June	No. of Household	353	502	512	430	203	2 000
	%	(17.7)	(25.1)	(25.6)	(21.5)	(10.2)	(100.0)
July	No. of Household	353	503	512	429	203	2 000
	%	(17.7)	(25.2)	(25.6)	(21.5)	(10.2)	(100.0)
August	No. of Household	354	503	513	428	202	2 000
	%	(17.7)	(25.2)	(25.7)	(21.4)	(10.1)	(100.0)
September	No. of Household	355	505	513	426	201	2 000
	%	(17.8)	(25.3)	(25.7)	(21.3)	(10.1)	(100.0)
October	No. of Household	356	505	514	425	200	2 000
	%	(17.8)	(25.3)	(25.7)	(21.3)	(10.0)	(100.0)
November	No. of Household	355	506	514	425	200	2 000
	%	(17.8)	(25.3)	(25.7)	(21.3)	(10.0)	(100.0)
December	No. of Household	355	507	514	425	199	2 000
	%	(17.8)	(25.4)	(25.7)	(21.3)	(10.0)	(100.0)
Overall	**No. of Household**	**4 236**	**6 024**	**6 152**	**5 151**	**2 437**	**24 000**
	%	**(17.7)**	**(25.1)**	**(25.6)**	**(21.5)**	**(10.2)**	**(100.0)**

<u>Note</u>

Households were sampled according to the actual distribution of PRH households by household size, which varies from month to month.   The percentages in brackets denote the distribution of sampled households in that month.

Comparison of distribution by district and estate between the tenant household sample and the actual overall distribution of tenant households in the first period (2011)

	District *	Name of Estate	Actual overall tenant households^		Tenant household sample	
			No.	%	No.	%
1.	CENTRAL & WESTERN	Sai Wan Estate	628	0.1	23	0.1
2.	EASTERN	Chai Wan Estate	1 484	0.2	55	0.2
		Fung Wah Estate	402	0.1	15	0.1
		Hing Man Estate	1 947	0.3	67	0.3
		Hing Tung Estate	2 094	0.3	73	0.3
		Hing Wah (1) Estate	2 241	0.3	78	0.3
		Hing Wah (2) Estate	3 418	0.5	121	0.5
		Hong Tung Estate	449	0.1	18	0.1
		Model Housing Estate	654	0.1	19	0.1
		Oi Tung Estate	3 819	0.6	135	0.6
		Siu Sai Wan Estate	5 975	0.9	214	0.9
		Tsui Lok Estate	318	0.0	9	0.0
		Tsui Wan Estate	642	0.1	21	0.1
		Wan Tsui Estate	3 555	0.5	126	0.5
		Yiu Tung Estate	5 118	0.7	178	0.7
		Yue Wan Estate	2 120	0.3	69	0.3
3.	SOUTHERN	Ap Lei Chau Estate	4 279	0.6	153	0.6
		Lei Tung Estate	2 732	0.4	96	0.4
		Ma Hang Estate	894	0.1	31	0.1
		Shek Pai Wan Estate	5 152	0.7	176	0.7
		Tin Wan Estate	3 069	0.4	104	0.4
		Wah Fu (1) Estate	4 733	0.7	157	0.7
		Wah Fu (2) Estate	4 284	0.6	155	0.6
		Wah Kwai Estate	1 135	0.2	42	0.2
4.	KOWLOON CITY	Ho Man Tin Estate	4 650	0.7	160	0.7
		Hung Hom Estate	1 168	0.2	44	0.2
		Ma Tau Wai Estate	2 041	0.3	69	0.3
		Oi Man Estate	6 211	0.9	215	0.9
		Sheung Lok Estate	333	0.0	18	0.1**
5.	KWUN TONG	Choi Fook Estate	2 643	0.4	94	0.4
		Choi Ha Estate	619	0.1	14	0.1
		Choi Tak Estate	2 789	0.4	97	0.4
		Choi Ying Estate	3 966	0.6	138	0.6
		Hing Tin Estate	529	0.1	19	0.1
		Kai Tin Estate	2 235	0.3	76	0.3
		Kai Yip Estate	4 103	0.6	142	0.6
		Ko Cheung Court	1 790	0.3	59	0.2**
		Ko Yee Estate	1 152	0.2	40	0.2
		Kwong Tin Estate	2 231	0.3	77	0.3
		Lam Tin Estate	2 958	0.4	104	0.4
		Lei Yue Mun Estate	3 153	0.5	110	0.5
		Lok Wah North Estate	2 919	0.4	105	0.4
		Lok Wah South Estate	6 673	1.0	233	1.0
		On Tin Estate	719	0.1	22	0.1
		Ping Shek Estate	4 484	0.6	152	0.6
		Ping Tin Estate	5 428	0.8	187	0.8

	District *	Name of Estate	Actual overall tenant households^		Tenant household sample	
			No.	%	No.	%
		Po Tat Estate	7 359	1.1	254	1.1
		Sau Mau Ping Estate	11 944	1.7	417	1.7
		Sau Mau Ping South Estate	3 859	0.6	135	0.6
		Shun Lee Estate	4 331	0.6	151	0.6
		Shun On Estate	2 928	0.4	101	0.4
		Shun Tin Estate	6 798	1.0	233	1.0
		Tak Tin Estate	2 162	0.3	75	0.3
		Tsui Ping North Estate	3 377	0.5	116	0.5
		Tsui Ping South Estate	4 599	0.7	160	0.7
		Upper Ngau Tau Kok Estate	6 537	0.9	228	1.0**
		Wan Hon Estate	960	0.1	32	0.1
		Wo Lok Estate	1 887	0.3	66	0.3
		Yau Lai Estate	6 527	0.9	230	1.0**
		Yau Tong Estate	3 528	0.5	121	0.5
6.	SHAM SHUI PO	Chak On Estate	1 755	0.3	62	0.3
		Fortune Estate	2 082	0.3	73	0.3
		Fu Cheong Estate	5 906	0.9	204	0.9
		Hoi Lai Estate	4 883	0.7	170	0.7
		Lai Kok Estate	2 798	0.4	98	0.4
		Lai On Estate	1 337	0.2	46	0.2
		Lei Cheng Uk Estate	1 392	0.2	44	0.2
		Nam Cheong Estate	795	0.1	32	0.1
		Nam Shan Estate	2 607	0.4	89	0.4
		Pak Tin Estate	8 366	1.2	293	1.2
		Shek Kip Mei Estate	4 856	0.7	168	0.7
		So Uk Estate***	1 030	0.1	44	0.2**
		Tai Hang Tung Estate	1 956	0.3	68	0.3
		Un Chau Estate	6 050	0.9	211	0.9
7.	WONG TAI SIN	Choi Fai Estate	1 301	0.2	47	0.2
		Choi Hung Estate	7 332	1.1	259	1.1
		Choi Wan (1) Estate	5 708	0.8	202	0.8
		Choi Wan (2) Estate	2 879	0.4	99	0.4
		Chuk Yuen North Estate	1 428	0.2	50	0.2
		Chuk Yuen South Estate	5 860	0.8	200	0.8
		Fu Shan Estate	1 552	0.2	60	0.3**
		Fung Tak Estate	1 395	0.2	49	0.2
		Lok Fu Estate	3 576	0.5	122	0.5
		Lower Wong Tai Sin (1) Estate	1 808	0.3	61	0.3
		Lower Wong Tai Sin (2) Estate	6 504	0.9	228	1.0**
		Mei Tung Estate	1 342	0.2	45	0.2
		Shatin Pass Estate	282	0.0	8	0.0
		Tsz Ching Estate	7 930	1.1	278	1.2**
		Tsz Hong Estate	1 994	0.3	67	0.3
		Tsz Lok Estate	6 114	0.9	217	0.9
		Tsz Man Estate	1 939	0.3	65	0.3
		Tung Tau (1) Estate***	660	0.1	22	0.1
		Tung Tau (2) Estate	2 542	0.4	89	0.4
		Upper Wong Tai Sin Estate	4 748	0.7	168	0.7
		Wang Tau Hom Estate	5 725	0.8	199	0.8
8.	YAU TSIM MONG	Hoi Fu Court	2 765	0.4	87	0.4
9.	ISLANDS	Cheung Kwai Estate	454	0.1	16	0.1
		Fu Tung Estate	1 635	0.2	57	0.2
		Kam Peng Estate	246	0.0	9	0.0
		Lung Tin Estate	359	0.1	11	0.0**

	District *	Name of Estate	Actual overall tenant households^		Tenant household sample	
			No.	%	No.	%
		Nga Ning Court	415	0.1	14	0.1
		Ngan Wan Estate	418	0.1	16	0.1
		Yat Tung (1) Estate	5 522	0.8	193	0.8
		Yat Tung (2) Estate	6 120	0.9	214	0.9
10.	KWAI TSING	Cheung Ching Estate	4 793	0.7	170	0.7
		Cheung Fat Estate	1 378	0.2	46	0.2
		Cheung Hang Estate	4 309	0.6	151	0.6
		Cheung Hong Estate	8 102	1.2	282	1.2
		Cheung On Estate	1 470	0.2	52	0.2
		Cheung Wang Estate	4 240	0.6	146	0.6
		Easeful Court	509	0.1	19	0.1
		High Prosperity Terrace	757	0.1	25	0.1
		Kwai Chung Estate	13 477	2.0	469	2.0
		Kwai Fong Estate	6 210	0.9	217	0.9
		Kwai Hing Estate	365	0.1	15	0.1
		Kwai Luen Estate	451	0.1	17	0.1
		Kwai Shing East Estate	6 183	0.9	218	0.9
		Kwai Shing West Estate	5 159	0.7	177	0.7
		Lai King Estate	4 152	0.6	147	0.6
		Lai Yiu Estate	2 777	0.4	95	0.4
		On Yam Estate	5 213	0.8	183	0.8
		Shek Lei (1) Estate	4 757	0.7	165	0.7
		Shek Lei (2) Estate	7 406	1.1	252	1.1
		Shek Yam East Estate	2 341	0.3	81	0.3
		Shek Yam Estate	2 633	0.4	89	0.4
		Tai Wo Hau Estate	7 333	1.1	255	1.1
		Tsing Yi Estate	816	0.1	35	0.1
		Wah Lai Estate	1 429	0.2	50	0.2
11.	NORTH	Cheung Wah Estate	2 225	0.3	77	0.3
		Ching Ho Estate	7 060	1.0	249	1.0
		Choi Yuen Estate	4 983	0.7	177	0.7
		Ka Fuk Estate	1 961	0.3	72	0.3
		Tai Ping Estate	360	0.1	14	0.1
		Tin Ping Estate	1 329	0.2	46	0.2
		Wah Ming Estate	1 922	0.3	64	0.3
		Wah Sum Estate	1 465	0.2	52	0.2
		Yung Shing Court	1 703	0.2	58	0.2
12.	SAI KUNG	Choi Ming Court	2 778	0.4	92	0.4
		Hau Tak Estate	4 137	0.6	143	0.6
		Kin Ming Estate	6 961	1.0	244	1.0
		King Lam Estate	1 775	0.3	57	0.2**
		Ming Tak Estate	1 488	0.2	51	0.2
		Po Lam Estate	2 112	0.3	74	0.3
		Sheung Tak Estate	5 493	0.8	193	0.8
		Shin Ming Estate	833	0.1	33	0.1
		Tsui Lam Estate	1 826	0.3	63	0.3
13.	SHATIN	Chun Shek Estate	2 110	0.3	71	0.3
		Chung On Estate	2 756	0.4	96	0.4
		Heng On Estate	1 081	0.2	38	0.2
		Hin Keng Estate	864	0.1	33	0.1
		Hin Yiu Estate	789	0.1	24	0.1
		Kwong Yuen Estate	1 513	0.2	54	0.2
		Lee On Estate	3 582	0.5	128	0.5
		Lek Yuen Estate	3 177	0.5	111	0.5
		Lung Hang Estate	4 304	0.6	151	0.6

	District *	Name of Estate	Actual overall tenant households^		Tenant household sample	
			No.	%	No.	%
		Mei Lam Estate	4 043	0.6	142	0.6
		Mei Tin Estate	5 463	0.8	191	0.8
		Pok Hong Estate	1 309	0.2	42	0.2
		Sha Kok Estate	6 176	0.9	216	0.9
		Shek Mun Estate	1 942	0.3	62	0.3
		Sun Chui Estate	6 542	0.9	231	1.0**
		Sun Tin Wai Estate	3 354	0.5	109	0.5
		Wo Che Estate	6 198	0.9	214	0.9
		Yan On Estate	913	0.1	31	0.1
		Yiu On Estate	1 226	0.2	41	0.2
14.	TAI PO	Fu Heng Estate	2 037	0.3	70	0.3
		Fu Shin Estate	2 634	0.4	87	0.4
		Kwong Fuk Estate	6 131	0.9	210	0.9
		Tai Wo Estate	2 255	0.3	76	0.3
		Tai Yuen Estate	4 671	0.7	164	0.7
		Wan Tau Tong Estate	737	0.1	24	0.1
15.	TSUEN WAN	Cheung Shan Estate	1 594	0.2	54	0.2
		Fuk Loi Estate	3 086	0.4	104	0.4
		Lei Muk Shue (1) Estate	2 285	0.3	76	0.3
		Lei Muk Shue (2) Estate	4 209	0.6	148	0.6
		Lei Muk Shue Estate	3 868	0.6	132	0.6
		Shek Wai Kok Estate	6 285	0.9	213	0.9
16.	TUEN MUN	Butterfly Estate	5 242	0.8	179	0.7**
		Fu Tai Estate	5 015	0.7	177	0.7
		Kin Sang Estate	634	0.1	24	0.1
		Leung King Estate	3 230	0.5	114	0.5
		On Ting Estate	4 976	0.7	176	0.7
		Po Tin Estate	6 579	1.0	230	1.0
		Sam Shing Estate	1 765	0.3	56	0.2**
		Shan King Estate	6 538	0.9	227	0.9
		Tai Hing Estate	8 287	1.2	287	1.2
		Tin King Estate	1 072	0.2	36	0.2
		Wu King Estate	4 292	0.6	147	0.6
		Yau Oi Estate	8 981	1.3	316	1.3
17.	YUEN LONG	Grandeur Terrace	4 075	0.6	144	0.6
		Long Ping Estate	4 684	0.7	163	0.7
		Shui Pin Wai Estate	2 343	0.3	89	0.4**
		Tin Chak Estate	3 965	0.6	137	0.6
		Tin Ching Estate	6 104	0.9	209	0.9
		Tin Heng Estate	5 727	0.8	203	0.8
		Tin Shui (1) Estate	4 540	0.7	158	0.7
		Tin Shui (2) Estate	3 143	0.5	112	0.5
		Tin Tsz Estate	3 262	0.5	116	0.5
		Tin Wah Estate	3 632	0.5	126	0.5
		Tin Yan Estate	5 313	0.8	184	0.8
		Tin Yat Estate	3 310	0.5	114	0.5
		Tin Yiu (1) Estate	4 562	0.7	157	0.7
		Tin Yiu (2) Estate	3 791	0.5	133	0.6**
		Tin Yuet Estate	4 086	0.6	145	0.6
	OVERALL		690 047	100.0	24 000	100.0

* The estates are grouped according to 17 districts for easy reference.   There are no PRH estates in Wan Chai district.

** Chi-square tests were conducted to compare the actual overall distribution of the sample and that of the tenancy records by district and by estate.   The results indicated that the differences between the actual and sampled distribution are insignificant.

*** So Uk Estate and Tung Tau (1) Estate in Sham Shui Po District and Wong Tai Sin District respectively were demolished in 2012 and hence not included in Annex C2.
^ Refer to the average number of households for the 12 month in 2011.

<u>Note</u>: Statistically, the sample distribution tallies with the actual distribution by design of the proportionate stratified systematic sampling method. That is, the sample effectively reflects the distribution of all PRH tenants by district and by estate.

Comparison of distribution by district and estate between
the tenant household sample and the actual overall distribution of tenant households
the second period (2013)

	District *	Name of Estate	Actual overall tenant households^		Tenant household sample	
			No.	%	No.	%
1.	CENTRAL & WESTERN	Sai Wan Estate	630	0.1	18	0.1
2.	EASTERN	Chai Wan Estate	1 595	0.2	57	0.2
		Fung Wah Estate	392	0.1	9	0.0**
		Hing Man Estate	1 957	0.3	64	0.3
		Hing Tung Estate	2 059	0.3	68	0.3
		Hing Wah (1) Estate	2 250	0.3	81	0.3
		Hing Wah (2) Estate	3 460	0.5	114	0.5
		Hong Tung Estate	457	0.1	14	0.1
		Model Housing Estate	663	0.1	19	0.1
		Oi Tung Estate	3 872	0.5	132	0.6**
		Siu Sai Wan Estate	5 999	0.8	200	0.8
		Tsui Lok Estate	317	0.0	8	0.0
		Tsui Wan Estate	603	0.1	22	0.1
		Wan Tsui Estate	3 584	0.5	117	0.5
		Yiu Tung Estate	5 092	0.7	171	0.7
		Yue Wan Estate	2 149	0.3	73	0.3
3.	SOUTHERN	Ap Lei Chau Estate	4 295	0.6	141	0.6
		Lei Tung Estate	2 517	0.4	85	0.4
		Ma Hang Estate	898	0.1	28	0.1
		Shek Pai Wan Estate	5 157	0.7	174	0.7
		Tin Wan Estate	3 074	0.4	101	0.4
		Wah Fu (1) Estate	4 731	0.7	161	0.7
		Wah Fu (2) Estate	4 291	0.6	144	0.6
		Wah Kwai Estate	1 102	0.2	42	0.2
4.	KOWLOON CITY	Ho Man Tin Estate	4 668	0.7	154	0.6**
		Hung Hom Estate	2 664	0.4	91	0.4
		Kai Ching Estate***	1 307	0.2	44	0.2
		Ma Tau Wai Estate	2 048	0.3	71	0.3
		Oi Man Estate	6 250	0.9	212	0.9
		Sheung Lok Estate	341	0.0	10	0.0
5.	KWUN TONG	Choi Fook Estate	3 429	0.5	115	0.5
		Choi Ha Estate	599	0.1	22	0.1
		Choi Tak Estate	5 700	0.8	194	0.8
		Choi Ying Estate	3 977	0.6	135	0.6
		Hing Tin Estate	480	0.1	15	0.1
		Kai Tin Estate	2 219	0.3	80	0.3
		Kai Yip Estate	4 165	0.6	144	0.6
		Ko Cheung Court	1 794	0.3	61	0.3
		Ko Yee Estate	1 166	0.2	36	0.2
		Kwong Tin Estate	2 248	0.3	79	0.3
		Lam Tin Estate	3 023	0.4	97	0.4
		Lei Yue Mun Estate	3 171	0.4	111	0.5**
		Lok Wah North Estate	2 946	0.4	100	0.4
		Lok Wah South Estate	6 761	0.9	229	1.0**
		Lower Ngau Tau Kok Estate***	4 069	0.6	137	0.6

	District *	Name of Estate	Actual overall tenant households^		Tenant household sample	
			No.	%	No.	%
		On Tin Estate	719	0.1	23	0.1
		Ping Shek Estate	4 524	0.6	154	0.6
		Ping Tin Estate	5 465	0.8	188	0.8
		Po Tat Estate	7 380	1.0	244	1.0
		Sau Mau Ping Estate	11 925	1.7	404	1.7
		Sau Mau Ping South Estate	3 974	0.6	133	0.6
		Shun Lee Estate	4 361	0.6	142	0.6
		Shun On Estate	2 937	0.4	99	0.4
		Shun Tin Estate	6 863	1.0	235	1.0
		Tak Tin Estate	2 081	0.3	75	0.3
		Tsui Ping North Estate	3 292	0.5	113	0.5
		Tsui Ping South Estate	4 621	0.6	150	0.6
		Upper Ngau Tau Kok Estate	6 547	0.9	219	0.9
		Wan Hon Estate	975	0.1	30	0.1
		Wo Lok Estate	1 905	0.3	62	0.3
		Yau Lai Estate	8 488	1.2	286	1.2
		Yau Tong Estate	3 545	0.5	118	0.5
6.	SHAM SHUI PO	Chak On Estate	1 780	0.2	59	0.2
		Cheung Sha Wan Estate***	368	0.1	12	0.1
		Fortune Estate	2 089	0.3	69	0.3
		Fu Cheong Estate	5 936	0.8	203	0.8
		Hoi Lai Estate	4 892	0.7	165	0.7
		Lai Kok Estate	2 829	0.4	99	0.4
		Lai On Estate	1 301	0.2	46	0.2
		Lei Cheng Uk Estate	1 324	0.2	44	0.2
		Nam Cheong Estate	749	0.1	24	0.1
		Nam Shan Estate	2 640	0.4	93	0.4
		Pak Tin Estate	7 722	1.1	262	1.1
		Shek Kip Mei Estate	8 532	1.2	289	1.2
		So Uk Estate	N.A.	N.A.	N.A.	N.A.
		Tai Hang Tung Estate	1 976	0.3	64	0.3
		Un Chau Estate	7 553	1.1	254	1.1
		Wing Cheong Estate***	172	0.0	7	0.0
7.	WONG TAI SIN	Choi Fai Estate	1 307	0.2	40	0.2
		Choi Hung Estate	7 351	1.0	250	1.0
		Choi Wan (1) Estate	5 761	0.8	193	0.8
		Choi Wan (2) Estate	2 921	0.4	101	0.4
		Chuk Yuen North Estate	1 351	0.2	41	0.2
		Chuk Yuen South Estate	5 948	0.8	203	0.8
		Fu Shan Estate	1 552	0.2	51	0.2
		Fung Tak Estate	1 315	0.2	42	0.2
		Lok Fu Estate	3 592	0.5	117	0.5
		Lower Wong Tai Sin (1) Estate	1 696	0.2	58	0.2
		Lower Wong Tai Sin (2) Estate	6 486	0.9	221	0.9
		Mei Tung Estate	1 421	0.2	44	0.2
		Shatin Pass Estate	1 229	0.2	43	0.2
		Tsz Ching Estate	7 954	1.1	269	1.1
		Tsz Hong Estate	1 994	0.3	69	0.3
		Tsz Lok Estate	6 080	0.9	204	0.9
		Tsz Man Estate	1 960	0.3	63	0.3
		Tung Tau (1) Estate	N.A.	N.A.	N.A.	N.A.
		Tung Tau (2) Estate	2 428	0.3	79	0.3
		Tung Wui Estate***	1 301	0.2	46	0.2

	District *	Name of Estate	Actual overall tenant households^		Tenant household sample	
			No.	%	No.	%
		Upper Wong Tai Sin Estate	4 791	0.7	161	0.7
		Wang Tau Hom Estate	5 772	0.8	192	0.8
8.	YAU TSIM MONG	Hoi Fu Court	2 776	0.4	94	0.4
9.	ISLANDS	Cheung Kwai Estate	451	0.1	15	0.1
		Fu Tung Estate	1 657	0.2	56	0.2
		Kam Peng Estate	248	0.0	9	0.0
		Lung Tin Estate	371	0.1	9	0.0**
		Nga Ning Court	416	0.1	14	0.1
		Ngan Wan Estate	422	0.1	12	0.1
		Yat Tung (1) Estate	5 548	0.8	190	0.8
		Yat Tung (2) Estate	6 275	0.9	209	0.9
10.	KWAI TSING	Cheung Ching Estate	4 821	0.7	166	0.7
		Cheung Fat Estate	1 254	0.2	41	0.2
		Cheung Hang Estate	4 321	0.6	147	0.6
		Cheung Hong Estate	8 173	1.1	278	1.2**
		Cheung On Estate	1 358	0.2	50	0.2
		Cheung Wang Estate	4 242	0.6	139	0.6
		Easeful Court	510	0.1	14	0.1
		High Prosperity Terrace	757	0.1	26	0.1
		Kwai Chung Estate	13 489	1.9	451	1.9
		Kwai Fong Estate	6 176	0.9	210	0.9
		Kwai Hing Estate	352	0.0	14	0.1**
		Kwai Luen Estate	1 427	0.2	44	0.2
		Kwai Shing East Estate	6 195	0.9	208	0.9
		Kwai Shing West Estate	5 174	0.7	172	0.7
		Lai King Estate	4 176	0.6	140	0.6
		Lai Yiu Estate	2 787	0.4	97	0.4
		On Yam Estate	5 202	0.7	171	0.7
		Shek Lei (1) Estate	4 765	0.7	157	0.7
		Shek Lei (2) Estate	7 412	1.0	254	1.1**
		Shek Yam East Estate	2 325	0.3	81	0.3
		Shek Yam Estate	2 627	0.4	82	0.3**
		Tai Wo Hau Estate	7 490	1.1	253	1.1
		Tsing Yi Estate	752	0.1	19	0.1
		Wah Lai Estate	1 427	0.2	51	0.2
11.	NORTH	Cheung Wah Estate	2 037	0.3	69	0.3
		Ching Ho Estate	7 096	1.0	240	1.0
		Choi Yuen Estate	5 000	0.7	170	0.7
		Ka Fuk Estate	1 944	0.3	63	0.3
		Tai Ping Estate	324	0.0	11	0.0
		Tin Ping Estate	1 209	0.2	40	0.2
		Wah Ming Estate	1 734	0.2	61	0.3**
		Wah Sum Estate	1 475	0.2	54	0.2
		Yung Shing Court	1 707	0.2	57	0.2
12.	SAI KUNG	Choi Ming Court	2 782	0.4	91	0.4
		Hau Tak Estate	4 116	0.6	139	0.6
		Kin Ming Estate	6 985	1.0	232	1.0
		King Lam Estate	1 654	0.2	60	0.3**
		Ming Tak Estate	1 464	0.2	47	0.2
		Po Lam Estate	1 938	0.3	65	0.3
		Sheung Tak Estate	5 489	0.8	182	0.8
		Shin Ming Estate	1 947	0.3	59	0.2**
		Tsui Lam Estate	1 703	0.2	62	0.3**
13.	SHATIN	Chun Shek Estate	2 107	0.3	73	0.3
		Chung On Estate	2 714	0.4	88	0.4

	District *	Name of Estate	Actual overall tenant households^		Tenant household sample	
			No.	%	No.	%
		Fung Wo Estate***	604	0.1	23	0.1
		Heng On Estate	964	0.1	36	0.2**
		Hin Keng Estate	790	0.1	26	0.1
		Hin Yiu Estate	792	0.1	27	0.1
		Kwong Yuen Estate	1 361	0.2	46	0.2
		Lee On Estate	3 595	0.5	127	0.5
		Lek Yuen Estate	3 169	0.4	108	0.5**
		Lung Hang Estate	4 329	0.6	152	0.6
		Mei Lam Estate	4 072	0.6	141	0.6
		Mei Tin Estate	5 992	0.8	203	0.8
		Pok Hong Estate	1 242	0.2	46	0.2
		Sha Kok Estate	6 216	0.9	207	0.9
		Shek Mun Estate	1 944	0.3	70	0.3
		Sun Chui Estate	6 592	0.9	227	0.9
		Sun Tin Wai Estate	3 373	0.5	116	0.5
		Wo Che Estate	6 224	0.9	211	0.9
		Yan On Estate	2 573	0.4	90	0.4
		Yiu On Estate	1 100	0.2	36	0.2
14.	TAI PO	Fu Heng Estate	1 871	0.3	66	0.3
		Fu Shin Estate	2 473	0.3	88	0.4**
		Kwong Fuk Estate	6 151	0.9	204	0.9
		Tai Wo Estate	2 050	0.3	70	0.3
		Tai Yuen Estate	4 698	0.7	159	0.7
		Wan Tau Tong Estate	673	0.1	19	0.1
15.	TSUEN WAN	Cheung Shan Estate	1602	0.2	49	0.2
		Fuk Loi Estate	3 109	0.4	101	0.4
		Lei Muk Shue (1) Estate	2 288	0.3	70	0.3
		Lei Muk Shue (2) Estate	4 243	0.6	142	0.6
		Lei Muk Shue Estate	3 876	0.5	137	0.6**
		Shek Wai Kok Estate	6 307	0.9	220	0.9
16.	TUEN MUN	Butterfly Estate	5 308	0.7	180	0.8**
		Fu Tai Estate	5 018	0.7	170	0.7
		Kin Sang Estate	600	0.1	22	0.1
		Leung King Estate	2 833	0.4	94	0.4
		Lung Yat Estate***	335	0.0	11	0.0
		On Ting Estate	4 981	0.7	168	0.7
		Po Tin Estate	6 495	0.9	214	0.9
		Sam Shing Estate	1 791	0.3	58	0.2**
		Shan King Estate	6 320	0.9	218	0.9
		Tai Hing Estate	8 370	1.2	282	1.2
		Tin King Estate	991	0.1	37	0.2**
		Wu King Estate	4 304	0.6	140	0.6
		Yau Oi Estate	9 077	1.3	308	1.3
17.	YUEN LONG	Grandeur Terrace	4 089	0.6	140	0.6
		Long Ping Estate	4 349	0.6	143	0.6
		Shui Pin Wai Estate	2 350	0.3	80	0.3
		Tin Chak Estate	3 970	0.6	136	0.6
		Tin Ching Estate	6 154	0.9	208	0.9
		Tin Heng Estate	5 744	0.8	194	0.8
		Tin Shui (1) Estate	4 573	0.6	151	0.6
		Tin Shui (2) Estate	3 155	0.4	110	0.5**
		Tin Tsz Estate	3 255	0.5	108	0.5
		Tin Wah Estate	3 647	0.5	123	0.5
		Tin Yan Estate	5 473	0.8	187	0.8
		Tin Yat Estate	3 321	0.5	109	0.5

District *	Name of Estate	Actual overall tenant households^		Tenant household sample	
		No.	%	No.	%
	Tin Yiu (1) Estate	4 596	0.6	156	0.7**
	Tin Yiu (2) Estate	3 805	0.5	129	0.5
	Tin Yuet Estate	4 127	0.6	139	0.6
OVERALL		711 937	100.0	24 000	100.0

* The estates are grouped according to 17 districts for easy reference.   There are no PRH estates in Wan Chai district.

** Chi-square tests were conducted to compare the actual overall distribution of the sample and that of the tenancy records by district and by estate.   The results indicated that the differences between the actual and sampled distribution are insignificant.

***Denotes new estates completed after 2011 and hence not included in Annex C1.

^ Refer to the average number of households for the 12 month in 2013.

Note: Statistically, the sample distribution tallies with the actual distribution by design of the proportionate stratified systematic sampling method.   That is, the sample effectively reflects the distribution of all PRH tenants by district and by estate.

**Distribution of Households in relation to
the Computation of Income Index in the First Period**

Household Size	No. of sampling units (a)	"Well-off tenants" (b)	Other households with high outlying income (c)	CSSA households (d)	Sampling units for computation of the income index (e)	No. of households after grossing up[2] (f)	Weighting after grossing up[2] (g)
1P	4 111	43	180	1 886	1 970	56 156	11.581%
2P	5 703	119	173	1 562	3 783	109 648	22.614%
3P	6 103	346	82	980	4 590	134 033	27.643%
4P	5 401	261	78	642	4 220	125 684	25.921%
5P or above	2 682	112	30	437	1 948	59 357	12.242%
Overall	24 000	881	543	5 507	16 511[1]	484 879	100%

(1) Figures are calculated by excluding from the sample size the "well-off tenants", other households with high outlying income, CSSA households, and invalid sampling units (e.g. deceased tenants and those who terminated their tenancies),etc.

(2) After discounting the "well-off tenants", other households with high outlying income, CSSA households and invalid sampling units, etc., we have used a standard grossing up statistical method to calculate the number of PRH households of different sizes. The proportion of PRH households of each size would be used as weights to compute the monthly average household income of PRH tenants as a whole.

Distribution of Households in relation to
the Computation of Income Index in the Second Period

Household Size	No. of sampling units (a)	"Well-off tenants" (b)	Other households with high outlying income (c)	CSSA households (d)	Sampling units for computation of the income index (e)	No. of households after grossing up [2] (f)	Weighting after grossing up [2] (g)
1P	4 236	43	169	1 838	2 165	63 470	12.146%
2P	6 024	105	164	1 425	4 255	127 445	24.390%
3P	6 152	255	64	847	4 843	146 642	28.063%
4P	5 151	215	49	543	4 202	128 018	24.499%
5P or above	2 437	110	20	347	1 825	56 964	10.901%
Overall	24 000	728	466	5 000	17 290[1]	522 539	100%

(1) Figures are calculated by excluding from the sample size the "well-off tenants", other households with high outlying income, CSSA households, and invalid sampling units (e.g. deceased tenants and those who terminated their tenancies), etc, etc.

(2) After discounting the "well-off tenants", other households with high outlying income, CSSA households and invalid sampling units, etc., we have used a standard grossing up statistical method to calculate the number of PRH households of different sizes. The proportion of PRH households of each size would be used as weights to compute the monthly average household income of PRH tenants as a whole.

As stipulated in section 16A(8) of the Housing Ordinance, "adjusted mean monthly household income" refers to the mean monthly income of tenants assessed on the basis of the distribution of the household size of those tenants over the first period. Hence for this rent review, the set of weights in column (g) in **Annex D1** will be used instead of column (g) in this Annex for computing the adjusted overall mean monthly household income. The set of weights in column (g) in this Annex will be used in the next rent review exercise.

Report on Quality Check on Survey Data and
Computation of Income Index for the Third Rent Review
Performed by the Census and Statistics Department

In accordance with Section 16A(7)(b) of the Housing Ordinance, the Commissioner for Census and Statistics shall compute the income index for the purpose of the rent review.   Data for computing the income index is obtained from the "Survey on Household Income of Public Rental Housing (PRH) Tenants" (the Income Survey) conducted by the Housing Authority (HA).

Quality checks on the income data

2.   The Census and Statistics Department (C&SD) has implemented a range of quality check measures to ensure impartiality, objectiveness and accuracy during the data collection and data processing of the Income Survey. The purpose is to evaluate and confirm the data quality of the Income Survey including representativeness of the samples, correctness of the declared income data and accuracy of data input.

3.   A summary of the quality checks on the income data performed by C&SD for the first period (i.e. 2011) and the second period (i.e. 2013) of the Third Rent Review is given in Table 1.

4.   Based on evidence obtained in the quality checks, C&SD concludes that the survey data accurately reflect the household income of PRH tenants in both 2011 and 2013.   The survey data can be used to compute the income index for PRH tenants for the third rent review.

Computation of income index for the Third Rent Review

5.   In accordance with Section 16A(7)(b) of the Housing Ordinance, C&SD has computed for the third rent review the mean monthly household income for the first period (i.e. 2011) and the mean monthly household income for the second period (i.e. 2013) computed with reference to the distribution of households by size in 2011 using the data of the Income Surveys for the respective years.   The results are presented in Tables 2 and 3

respectively.   The income indices for PRH tenants in both 2011 and 2013 are also computed and presented in the tables.   For ease of reference, the mean monthly household income for 2013 computed with reference to the distribution of households by size in 2011 will be referred to as the "adjusted mean monthly household income for 2013" in Table 3.

Census and Statistics Department
June 2014

Table 1 of Annex E

Quality Checks Performed by Census and Statistics Department

No.	Check	Description	Checking Results
(1)	Evaluation of the representativeness of the sample in terms of household size and geographical distribution	• The samples of PRH households selected in 2011 and 2013 were studied and compared with the overall distribution of the tenancy records of the Housing Department (HD) of the respective years by household size and by district and estate. • Statistical tests (Chi-square test) were conducted and the results showed that the distribution of the sample was basically the same as that of the tenancy records, and hence the samples of the Income Survey in both 2011 and 2013 were representative.	Conclusion: Checked in order Remarks: • Distribution of the sample was statistically comparable to that of tenancy records.
(2)	Correctness of declared income data against documentary proof	• A 5% sample of households who had declared income were randomly selected by C&SD for the check. • The HD then requested these households to submit income documentary proof to support that the information declared was true and correct. • To verify whether the checking by HD was carried out properly, C&SD randomly selected those cases checked by HD to see if the checking was in order.	Conclusion: Checked in order Remarks: • No tenants knowingly made false statements in the Income Survey. • The differences between the declared income data and the data obtained from documentary proof, which had been suitably rectified for inclusion in the computation of income index, were of very

No.	Check	Description	Checking Results
			small and similar magnitudes in 2011 and 2013, hence had virtually no impact on the computation of income index. ● No irregularities on the checking performed by HD had been found.
(3)	Accuracy of data input by HD	● A double data entry approach, i.e. the same set of data was input into the computer by two staff members independently, was implemented.　These two sets of data were then compared and matched with each other for verification to avoid manual input errors. ● A 2% sample was randomly selected by C&SD for checking the accuracy of data input performed by HD.	Conclusion:　Checked in order Remarks: ● No data input errors had been found.
(4)	Evaluation of data validation conducted by HD	● Computerised validation checks were performed by HD on the inputted data so as to identify those data in need of further clarification with the households concerned. ● C&SD carried out an independent round of data validation and checks to see if HD had verified all those cases in need of further clarification with the households concerned.	Conclusion:　Checked in order Remarks: ● HD had confirmed / clarified all cases in need of further clarification with the households concerned before preparing the dataset for computation of income index by C&SD.

Table 2 of Annex E

**Mean Monthly Household Income of PRH Tenants
in the First Period of the Third Rent Review** [Note]

Household size	Mean monthly household income	% Distribution of household size (weights)
1-person	$4,687	11.581%
2-person	$10,022	22.614%
3-person	$15,942	27.643%
4-person	$20,246	25.921%
5-person or above	$24,583	12.242%
		100.0%

Overall mean monthly household income   **$15,473**

Computed as follows:

  $4,687 × 11.581% + $10,022 × 22.614% + $15,942 × 27.643% + $20,246 × 25.921% + $24,583 × 12.242%

= **$15,473**

Index for the first period is set at 100.

Note:

Please note that income figures in the above table have been rounded to the nearest integer and the weights presented in percentage have been rounded to the nearest three decimal places. Such arrangement is solely for presentation purpose. In practice, income figures and weights are all computed in full figures.

Table 3 of Annex E

**Adjusted Mean Monthly Household Income of PRH Tenants
in the Second Period of the Third Rent Review** [Notes]

Household size	Mean monthly household income	% Distribution of household size (weights of the first period)
1-person	$5,299	11.581%
2-person	$11,807	22.614%
3-person	$19,118	27.643%
4-person	$24,071	25.921%
5-person or above	$29,795	12.242%
		100.0%

Overall adjusted mean monthly household income   **$18,455**
Computed as follows:

    $5,299 × 11.581% + $11,807 × 22.614% + $19,118 × 27.643% +
        $24,071× 25.921% + $29,795 × 12.242%
    = **$18,455**

Index for the second period
    = $18,455 / $15,473 × 100
    = **119.27**

Notes:
(1) Please note that income figures in the above table have been rounded to the nearest integer and the weights presented in percentage have been rounded to the nearest three decimal places. Such arrangement is solely for presentation purpose. In practice, income figures and weights are all computed in full figures.
(2) In accordance with Section 16A of the Housing Ordinance, the HA shall increase or reduce the PRH rent by the rate of change of the income index if the income index for the second period is higher or lower than that of the first period by more than 0.1%. The computation on the rate of change is based on the default number of decimal places in the computer system. In order to show with certainty whether the rate of change is more than 0.1%, the income index is rounded to the nearest two decimal places.

The Rent Assistance Scheme

Eligibility Criteria

The HA offers assistance to PRH tenants facing temporary financial difficulties through the Rent Assistance Scheme (RAS). Non-elderly households whose income levels meet the two different sets of thresholds will be eligible for rent reduction of either 25% or 50%. Elderly households meeting the eligibility criteria are eligible for rent reduction of 50%. The detailed criteria are as follows –

	Non-elderly Households		**Elderly Households（All members aged 60 or above）**
Rent Reduction	**50%**	**25%**	**50%**
Income	(a) <50% WLIL or (b) RIR>25% or (c) 50% - 70% WLIL and RIR>15%	(a) 50% - <70% WLIL or (b) RIR >18.5% - 25%	(a) <70% WLIL or (b) RIR>18.5%

WLIL = Waiting List Income Limits
RIR = Rent-to-Income Ratio

Administrative Arrangements

2. The HD actively renders assistance to eligible tenants via the following actions –

(a) upon receipt of the application form and requisite information, the HD will complete the processing of applications and notify the tenants within two weeks;

(b) for applications received on or before the 15th of each month, rent assistance is provided with retrospective effect for that month;

(c)   widely publicizes the RAS through various channels, e.g. posters and leaflets, the radio, Housing Channel, HA/HD web site, EMAC newsletter, etc.; and

(d)   reminds tenants with rent arrears on the availability of the RAS in the rent chasing letters. It is also stated in the rent adjustment notification letters to tenants that the RAS is available. In this respect, the HD in particular reaches out to households with elderly and disabled members. The HD highlights in the notification letters that staff of the HD stand ready to assist tenant households with elderly and disabled family members in their RAS applications where necessary.