Guide to the Guernsey Price Inflation Indices

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This publication provides an overview of each of the indices, which are used to measure inflation in prices of goods, services and properties in Guernsey.

States of Guernsey
Data and Analysis

1.1 Introduction

This guide provides information on the price inflation indices published in Guernsey. The publication contains an overview of what each index represents, how they are calculated and how they should be used. This guide was updated in October 2022 to coincide with an expansion in the range of indices published by the Data & Analysis Service.

The indices are used to measure how prices of goods, services and properties have changed over time; the headline inflation figures published each quarter are the annual percentage changes in the indices.

1.2 The Guernsey Inflation Indices

The first Retail Price Index (RPI) for Guernsey was started in 1949. Since then various other indices have been introduced. The methods used to calculate the indices are periodically reviewed and since 2014 have been aligned with international standards. The calculation method has been audited by the UK Office of National Statistics (ONS) and the Data & Analysis Service maintain regular contact with the ONS to ensure the methodologies are kept up to date.

The range of indices relating to price inflation currently calculated each quarter by the Data & Analysis Service are listed below:

Retail Price Indices - measures of the price inflation experienced by people living in private households on the Island:

- RPI - all items (including mortgage interest payments)
- RPIX - excludes mortgage interest payments
- RPICT - excludes mortgage interest payments and the effect of changes to indirect taxes
- RPIY - excludes mortgage interest payments and indirect taxes

Household Cost Indices - measures of the (all items, including owner occupiers housing costs) price inflation experienced by people living in specific types of private households on the Island:

- Low income vs. high income households
- Households containing one or more child vs. households with none
- Households containing one or more retired person vs. households with none
- Households containing one or more person with a disability or long term illness that limits their activities vs. households with none
- Owner occupier households without mortgage vs. Owner occupier households with mortgage vs. Private renter households vs. Social renter and partial owner households
- Overall HCI (for reference)

Residential Property Price Indices - measures of local market residential property price inflation:

- Purchase prices
- Rental prices

1.2 The Guernsey Inflation Indices (continued)

It is important to understand the broad differences between the measures, in order to know which one to use in each particular situation.

The **RPI** measures show the average price inflation for private households. They have been calculated using broadly the same method since 1949 and so can be used to reflate monetary time series data that goes back as far as that. The method assumes that households buy exactly the same items from one quarter to the next and do not modify what they buy when faced with price changes.

The **HCI** measures are designed to show how changes in the cost of living for particular types of private households compare with each other and to show the average price inflation for those specific household types. It ensures low income/spend households are represented equally alongside high income/spend households. The method assumes that some people modify what they buy to a certain extent when faced with large price increases; it assumes the person may buy a different brand of item from the same supplier if their normal brand has gone up a lot in price (but not that the person switches supplier nor buys a totally different item instead). This method is deemed to most accurately model real behaviours.

The RPIs and HCIs all measure the price changes from one quarter to the next in a like-for-like basket of goods and services (albeit with different weights applied so that the overall average change that is calculated is representative of a different group of people, see **Section 2** for more information on each index).

The **residential property purchase and rental price indices** respectively track trends in the capital cost of buying a property and the cost of renting one (for habitation by a private household). They monitor the changes in prices of actual properties purchased and advertised for rent i.e. it is not an entirely like-for-like basket, but it is mix-adjusted to account for this. See **Section 4** for more information.

Other inflation measures, such as producer prices and the GDP deflator, published by other jurisdictions and used to adjust for inflation in national income and public expenditure, for example, cannot currently be calculated for Guernsey.

None of the inflation indices measure the “cost of living” in pounds, which varies between households depending on their size, composition and living requirements as shown by the results of the regular Household Expenditure Survey (see **www.gov.gg/household**).

Price indices can be used to work out the relative “purchasing power” of a sum of money now compared with a point in time in the past or to “reflate” monetary values from the past, so they are comparable with present day values. They are often used to inform how much payment values, such as pensions, benefits, child maintenance and wages should be updated by each year. Sometimes prices of services, goods and rents are also increased by one of the inflation indices to help ensure that the incomes derived from them keep pace with other salaries and pensions etc. More information on which index to use in different situations is provided on the next page.

1.3 Which index to use

If you have a contract, lease or agreement that says the value must be updated by a specific index, then you must use that one e.g. the RPI. However, if your contract or agreement just says that it is due to be updated in line with inflation or by the change in the cost of living (but not by a specific index), then there is an element of choice regarding which index you use.

The RPICT and RPIY tend only to be used to monitor the impacts of government duties and other indirect taxes on price inflation.

The RPIX, which excludes owner occupiers housing costs, tends to be more stable from one quarter or year to the next than the RPI.

In the case of wage negotiations, where no agreement has been made in advance, either or both the RPI and the RPIX tend to be preferred to inform negotiations. Other information such as changes in median earnings, which can be found on **https://gov.gg/population** may also be useful. Similarly, if you are looking to update prices that you charge for goods, services or to rent your property, for example, then (unless these are bound by a contract, lease or agreement) it may help to consider the RPI, RPIX and/or changes in median earnings or your own personal cost of living.

If you are looking to update a payment that goes to a specific group of people, you may wish to use one of the HCIs. But for payments to less specific groups of people, RPI or RPIX may be better guides.

If you are looking to update the estimated value of a residential property and are instructed to use the "house price index" or equivalent, then you will most likely need to use the mix-adjusted residential property purchase price index or the index for a particular property type, like a one bedroom apartment, for example. However, it should be noted that these indices are not intended to show how much the value of any given property has changed over time, since they measure the prices of different properties each quarter rather than the same ones over time. If an accurate estimate is required, then you should seek one or more property valuations.

We advise that once you have chosen the index you are going to use that you stick to using that index for any subsequent updates and always do the update at the same time of year. It may help to note the index used, the base year and the dates used for future reference e.g. RPI (1949 base), June figure (published each July). The base year you choose will depend on which time periods you wish to use as your start and end dates. For example, if you need to update a 2020 price, then using the index based in 2014 would make sense. But, if you have an earlier start date, then you will need to pick an index based earlier than that.

Whichever index you choose, if you are calculating the reflation factor or percentage increase yourself, please ensure you use two index figures with the same base year. In order to keep the index figures to a manageable size they are "rebased" to a value of 100 after each Household Expenditure Survey (once every five to seven years). However, index figures from previous base years are also maintained and published. The percentage change in the value of the index over any given time period is the same regardless of the index base year chosen. However, it is vitally important to ensure that indices with the same base year are being compared when calculating the change in prices.

1.4 How to use the indices

If you have a payment amount that you need to update e.g. pensions, benefits, child maintenance and wages, charges for goods or services or rents (or if you have a property purchase value that you need to update to provide an estimate of the current value e.g. for building insurance):

The **inflation calculator** on **https://gov.gg/rpi** is designed to make it easy for you to find out the change in retail prices between any two dates of your choosing. It also enables you to enter an amount in pounds and apply the change to update that amount using your chosen measure of inflation. Please note that the calculator uses unrounded index figures whereas all other tables present the indices to one decimal place, which can result in a difference in the results gained using the calculator compared with a manual calculation.

If you prefer to do the calculations yourself, you can calculate the reflation factor (the number to multiply your monetary value by) as follows:

$$\text{Reflation factor} = \frac{\text{(Later date index – Earlier date index)}}{\text{Earlier date index}} + 1$$

The most important thing is to ensure you are always using two index numbers from the same series i.e. with the same base year.

You will find tables of **reflation factors** available to download from **https://gov.gg/rpi** and in the **Facts & Figures Booklet**. These can be used to update your monetary value by the value of inflation over one year (to the date of the publication) two years, five years etc. E.g. A household 45 years in the past that had £10 to spend would update to a household today that has £100 to spend.

The reflation factor itself is sometimes called the "purchasing power" e.g. a sum of money from 45 years ago might have 10 times the purchasing power of the same value in today's money.

If you have time series data in pounds that you want to look at after the effects of inflation have been removed, rather than in nominal or current (unadjusted) terms:

If you would like to make your data comparable with the most recent data point (often called presenting figures as "real" values or, for example, as 2022 values), you can put each value into the inflation calculator and it will do the calculations for you or you can multiply your figures by the relevant reflation factors, as described above.

If you would like to make your data comparable with an earlier data point (often called presenting figures as "constant" values or, for example, as 2001 values), you will need to divide each of the values in your series by the relevant reflation factor. I.e. the reflation factor can either be used to multiply an older monetary value in order to make it comparable with a newer value or it can be used to divide a newer monetary value in order to make it comparable with an older value. If you would like to make your data comparable with a point in the middle of the series, you will need to do a mixture of multiplying and dividing.

2.1 The Retail Price Indices

The RPIs are intended to represent people living in self-contained households in Guernsey. There are four RPI measures for Guernsey that are published quarterly:

RPI - all items (including mortgage interest payments) (1949 on)
RPIX - excludes mortgage interest payments (1998 on)
RPICT- excludes mortgage interest payments and the effect of changes to indirect taxes (2008 on)
RPIY - excludes mortgage interest payments and indirect taxes (2008 on)

Mortgage interest rates are directly affected by changes made by The Bank of England (BoE) to the base rate in the UK. The mortgage interest item has a comparatively high weight in the Guernsey RPI (see table below for comparison of weights used in RPI and RPIX). The result of this is that changes made by BoE to the base rate, which are reflected by Guernsey mortgage lenders, can have a significant impact on the Guernsey RPI. This effect is not present in the RPIX, which excludes mortgage interest payments costs.

The RPIY measures what the RPIX would be if indirect taxes (such as excise duty and property taxes) were not charged. Whereas, the RPICT measures what the RPIX would be if indirect tax levels did not change. These measures both remove the elements of inflation that can be directly influenced by government, but in slightly different ways. They tend to be similar in value to each other.

Price changes are weighted, to ensure they have a proportionate effect on the overall index. For example bread has a higher weighting than butter, because on average, households spend more on bread than on butter. As a result a 10% increase in the price of bread will have a larger impact on the index than a 10% increase in the price of butter. If for example, households spent on average twice as much on bread as they did on butter, the impact of a 10% increase in the price of bread would be double that of the impact of a 10% increase in the price of butter.

The RPI weights are derived from the results of the Household Expenditure Survey (calculated as plutocratic mean averages, as described on **page 18**, with very high income households and very low income pensioner households removed) and they reflect the proportion of total household expenditure spent on average on those types of goods and services.

The RPIs are susceptible to the “formula effect” that results from using the Dutot method of aggregating price changes to get to an overall average. The Jevons method (used in the RPIJ and all the CPIs and HCIs) is deemed to give a truer reflection of how shoppers actually behave when faced with price changes. The value of the formula effect i.e. the difference between using the Dutot and the Jevons methods are also published quarterly regarding the RPI and the RPIX for transparency. See **Pages 16 and 17** for more detail on the Dutot and Jevons methods and the formula effect.

To aid understanding of inflationary pressures, the contributions from different groups of goods and services are presented in the quarterly Inflation Bulletin. For comparability with UK and Jersey RPIs, 14 groups are presented, as described in **Table 2.1.1**. The weight for each group (shown in parts per 1,000) for each RPI is shown in **Table 2.1.2**. Further breakdown into 86 classes is also possible. See **Page 16** for more information on classes and groups.

Table 2.1.1 provides a summary of the goods and services included within each of the 14 groups, which are used within the quarterly Inflation Bulletin to aid understanding of inflation.

Table 2.1.1: RPI Groups

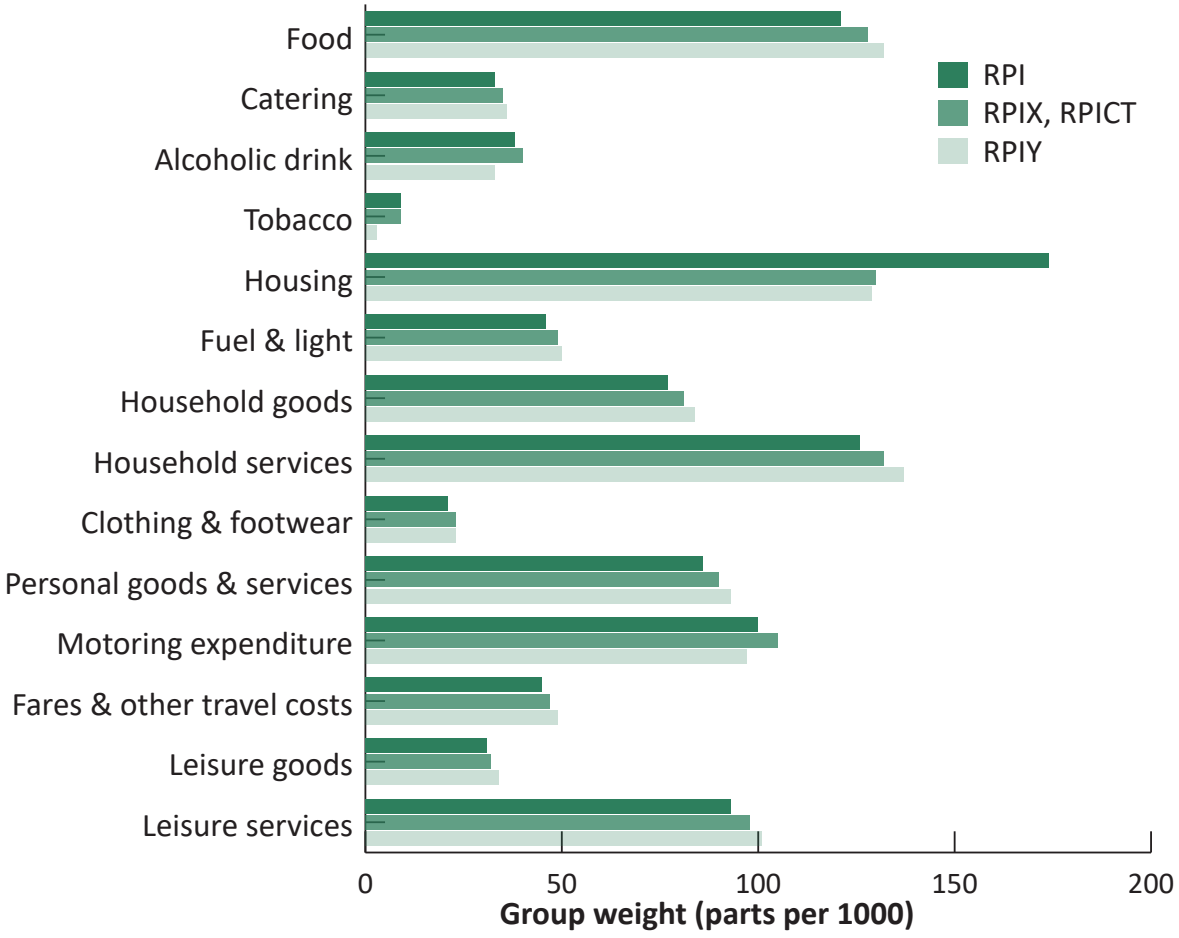
Group	Goods and Services Included
Food	Supermarket and other shop bought food and non-alcoholic beverages.
Catering	Restaurant, café, pub, bar, canteen and take-away food and non-alcoholic drinks.
Alcoholic drink	On and off licensed premises sales of alcoholic drinks.
Tobacco	Tobacco based products and e-cigarettes.
Housing	Rents, mortgage interest payments, TRP, parish rates, waste charges, water charges, materials and tools for repairs and DIY, plumbers, electricians etc.
Fuel & light	Electricity, oil, coal, gas.
Household goods	Furniture, carpets, rugs, soft furnishings, kitchen and dining ware, cleaning products, household appliances, pet care, stationary and postage.
Household services	Phone, internet, child minder, home help, cleaner and other fees and charges.
Clothing & footwear	Clothes, shoes, accessories.
Personal goods & services	Glasses, contact lenses, medical, cosmetic and sanitary products. Jewellery, watches, bags and personal appliances. Medical, dental and beauty treatments.
Motoring expenditure	Vehicle purchase and maintenance, motor fuel.
Fares & other travel costs	Rail, air and sea fares. Bicycles, buses, coaches and taxis.
Leisure goods	TVs, computers, music, films, books, newspapers and magazines. Toys, games and sports goods. Gardening supplies and tools.
Leisure services	Entertainment and sport subscriptions, exercise classes, cinema, theatre etc. Holidays (both within and outside the Channel Islands) including catered and self-catering accommodation.

NB. Insurance is included within the relevant group e.g. car insurance is included within the motoring group.

Table 2.1.2: RPI group weights

Group	RPI	RPIX and RPICT	RPIY
Food	121	128	132
Catering	33	35	36
Alcoholic drink	38	40	33
Tobacco	9	9	3
Housing	174	130	129
Fuel & light	46	49	50
Household goods	77	81	84
Household services	126	132	137
Clothing & footwear	21	23	23
Personal goods & services	86	90	93
Motoring expenditure	100	105	97
Fares & other travel costs	45	47	49
Leisure goods	31	32	34
Leisure services	93	98	101
Total	1000	1000	1000

Figure 2.1.1: RPI group weights



The all items RPI has been calculated in Guernsey since 1949. The weights are derived from the results of the Household Expenditure Survey, which is undertaken every 5 to 7 years. They are implemented within a year or two of each survey being completed.

The history of how the weights have changed since 1964 are shown in **Table 2.1.3**. As can be seen, the groups used to present the analysis have changed over time as well as the weights themselves. The most significant alterations to the grouping were introduced after the survey completed in 1988.

Up until the 2012-2013 Survey, only expenditure on goods and services in RPI groups was captured. However, from 2012-2013 onwards, the surveys have captured more areas of expenditure including capital purchases and home improvements, which are not included in the RPIs (see **https://gov.gg/household** for survey results). The survey completed in 2013 also for the first time gave results that followed an international framework, so the RPIs could be presented in a manner that enabled them to be directly compared with indices published in the UK and Jersey.

Table 2.1.3: RPI group weights history

Group	Year of completion of Household Expenditure Survey									
	1964	**1973**	**1978**	**1983**	**1988**	**1993**	**1999**	**2006**	**2013**	**2019**
Food	317	255	230	193	149	163	127	95	111	121
Catering	5	29	35	45	55	48	55	50	40	33
Alcoholic drink	50	51	42	44	39	38	52	31	36	38
Tobacco	36	21	19	19	12	14	19	15	10	9
Housing	109	111	96	122	181	206	216	331	218	174
Fuel & light	64	77	73	82	56	57	41	33	47	46
Durable household goods	48	61	82	83	-	-	-	-	-	-
Household goods	-	-	-	-	95	70	79	49	63	77
Household services	-	-	-	-	26	24	33	72	100	126
Clothing & footwear	102	91	76	75	82	65	56	38	29	21
Personal goods & services	-	-	-	-	58	58	49	49	74	86
Transport & vehicles	100	132	161	157	-	-	-	-	-	-
Motoring expenditure	-	-	-	-	99	100	85	78	81	100
Fares & other travel costs	-	-	-	-	32	26	33	22	47	45
Leisure goods	-	-	-	-	52	57	63	61	42	31
Leisure services	-	-	-	-	64	74	92	77	102	93
Services	90	92	99	100	-	-	-	-	-	-
Miscellaneous	79	80	87	80	-	-	-	-	-	-
Total	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**

2.2 The Household Cost Indices

The HCI measures are designed to show how changes in the cost of living for particular types of households compare with each other and to show the average price inflation for each household type. There are nine HCI measures for Guernsey that have been published quarterly since October 2022:

- **Low income** (2nd decile after equivalisation) vs. **high income** (9th decile after equivalisation) households
- Households containing one or two adults plus **one or more child(ren)** vs. households with one or two adults and **no children**
- Households containing **one or more retired person** vs. households with **none**
- Households containing **one or more person with a disability or long term illness that limits their activities** vs. households with **none**
- **Owner occupier households without mortgage** vs. **Owner occupier households with mortgage** vs. **Private renter households** vs. **Social renter and partial owner households**
- Overall HCI (for reference)

The only differences between these indices are their weights (see **pages 12 to 14**) as they are designed to be compared with each other. They all include all items (including owner occupied housing costs measured directly like for RPI, rather than as an imputed rental figure). The HCIs all use the Jevons method, which is deemed to best model people's behaviour.

The weights are all derived from the results of the Household Expenditure Survey (the same source as is used to determine the weights for the RPIs). However, they are calculated democratically, rather than plutocratically, which results in each household being equally represented in the weighting (regardless of the value of their total expenditure). The weights used for the RPIs are derived plutocratically, which means that the households that spend more have a greater influence on the weights than those that spend less. The plutocratic approach is appropriate for macroeconomic measures (which are intended to show the average inflation across all the goods and services bought by all the households in an economy). However, it is not favoured for those relating to specific, smaller groups of households such as those represented by the HCIs), which are intended to aid understanding of how inflation is impacting at a more individual level.

The HCIs are presented in comparison with each other in the quarterly Inflation Bulletin, to show which types of household are generally experiencing higher levels of inflation.

For comparability with UK HCIs (and CPIs), the HCIs are broken down into 12 divisions, as described in **Table 2.2.1**. Further breakdown into 41 groups and 91 classes is also possible. See **Page 16** for more information on classes, groups and divisions. To aid understanding of inflationary pressures, goods and services from across all the divisions have also been classified as either staple or additional (as described in **Table 2.2.2**), based on the UK ONS's categorisation that was applied during the coronavirus pandemic (albeit originally the categories were called non-discretionary and discretionary).

The weight for each division of goods and services and for staple compared to additional goods and services for each HCI is shown (in parts per 1,000) in **Tables 2.2.3 and 2.2.4** and in **Figures 2.2.1 to 2.2.6**.

Table 2.2.1: HCI divisions

Division	Goods and Services Included
Food & non-alcoholic beverages	Supermarket and other shop bought food and non-alcoholic beverages.
Alcoholic beverages & tobacco	Off licence sales of alcoholic drinks. Tobacco based products and e-cigarettes.
Clothing & footwear	Clothes, shoes, accessories, hire and repair.
Housing & household services	Rents, mortgage interest payments, TRP, parish rates, waste and water charges, electricity, oil, coal, gas, materials for maintenance and repairs, plumbers, electricians etc. Self-catering accommodation in CI.
Furniture & household goods	Furniture, carpets, rugs, soft furnishings, kitchen and dining ware, cleaning products, household appliances, cleaners.
Health	Glasses, contact lenses, prescriptions, medicines, vitamins. Medical, dental etc services. Nursing homes.
Transport	Driving test, removals, vehicle purchase and maintenance, motor fuel.
Communication	Post, phone, internet.
Recreation & culture	Pets, books, newspapers, stationary, gardening, sports, toys and games. Holidays.
Education	School and university fees.
Restaurants & hotels	Restaurant, café, pub, bar, canteen and take-away food and drinks (including non-alcoholic and alcoholic drinks).
Miscellaneous goods & services	Childminders, home help, all insurance, financial fees, licences etc. Jewellery, watches, bags and personal appliances.

NB. All insurance is included within the **Miscellaneous goods & services** group.

Table 2.2.2: HCI categories (staple vs. additional)

Category	Goods and Services Included
Staple goods & services	Essential goods and services, where the consumer has little choice regardless of price and income pressures. Such as: basic foods and non-alcoholic drinks, housing, utilities, phone and computer connectivity, postage, child minders, clothes and shoes, licences and fees for financial services.
Additional goods & services	Goods and services where the consumer exercises some degree of choice over whether or not to buy and how much they spend (the price and amount purchased). Such as: biscuits, cakes, sweets, restaurant and take-away foods and drinks, alcoholic drinks, cigarettes, home furnishings, cleaners, gardeners, clothing accessories, vehicle purchases, air and sea fares, toys, games, books, exercise classes, sports, entertainment, DIY and gardening tools and materials, private and higher education.

NB. These two categories were called non-discretionary and discretionary in previous analysis.

Table 2.2.3: HCI weights (part 1)

	Household income		Child(ren)		Retired person(s)		Person(s) with a disability or long-term illness that limits their activities	
	Low	High	Yes	No	Yes	No	Yes	No
Food & non-alcoholic beverages	166	104	133	131	160	131	162	138
Alcoholic beverages & tobacco	56	22	22	36	32	29	43	28
Clothing & footwear	14	27	23	23	18	23	16	22
Housing & household services	308	216	303	281	215	284	307	248
Furniture & household goods	59	79	60	74	78	68	62	73
Health	51	39	26	32	57	30	44	40
Transport	78	137	115	108	108	109	88	113
Communication	36	26	33	35	32	35	35	33
Recreation & culture	89	155	101	128	136	121	97	133
Education	1	23	25	10	7	19	11	15
Restaurants & hotels	53	71	42	61	61	54	35	61
Miscellaneous goods & services	88	103	117	82	98	97	100	97
Staple goods & services	644	492	618	566	571	581	644	563
Additional goods & services	356	508	382	434	429	419	356	437
Total	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**

Table 2.2.4: HCI weights (part 2)

	Owner occupier households without mortgages	Owner occupier households with mortgages	Private renter households	Social renter and partial owner households	Overall
Food & non-alcoholic beverages	160	122	116	148	142
Alcoholic beverages & tobacco	31	20	28	47	30
Clothing & footwear	22	25	17	15	21
Housing & household services	165	245	405	453	258
Furniture & household goods	83	77	43	47	71
Health	55	32	29	21	41
Transport	120	121	102	48	109
Communication	34	31	34	40	34
Recreation & culture	150	133	92	69	127
Education	13	25	9	2	14
Restaurants & hotels	68	60	36	34	57
Miscellaneous goods & services	99	110	89	76	97
Staple goods & services	525	544	670	742	577
Additional goods & services	475	456	330	258	423
Total	**1000**	**1000**	**1000**	**1000**	**1000**

Figure 2.2.1: HCI weights - household income

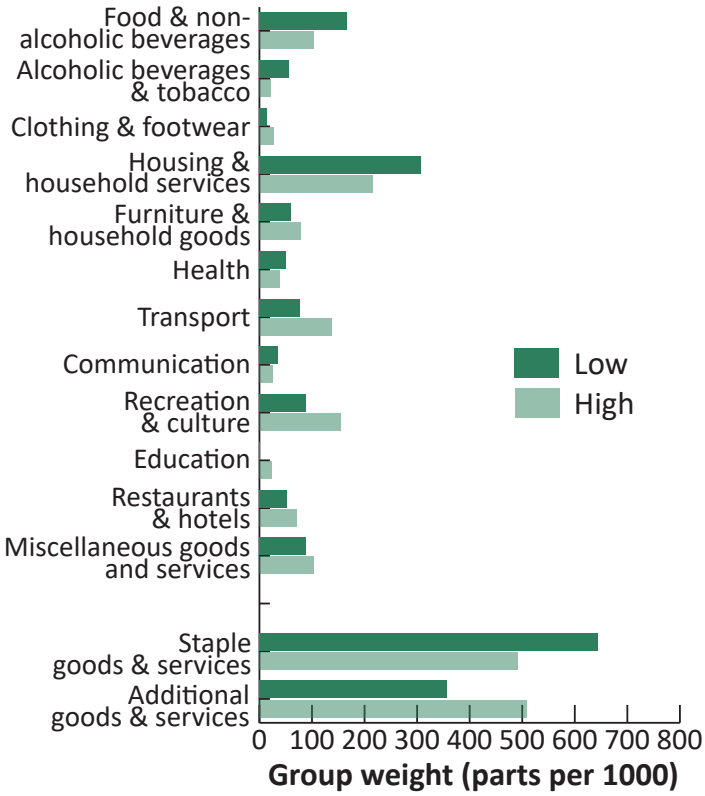


Figure 2.2.2: HCI weights - child(ren)

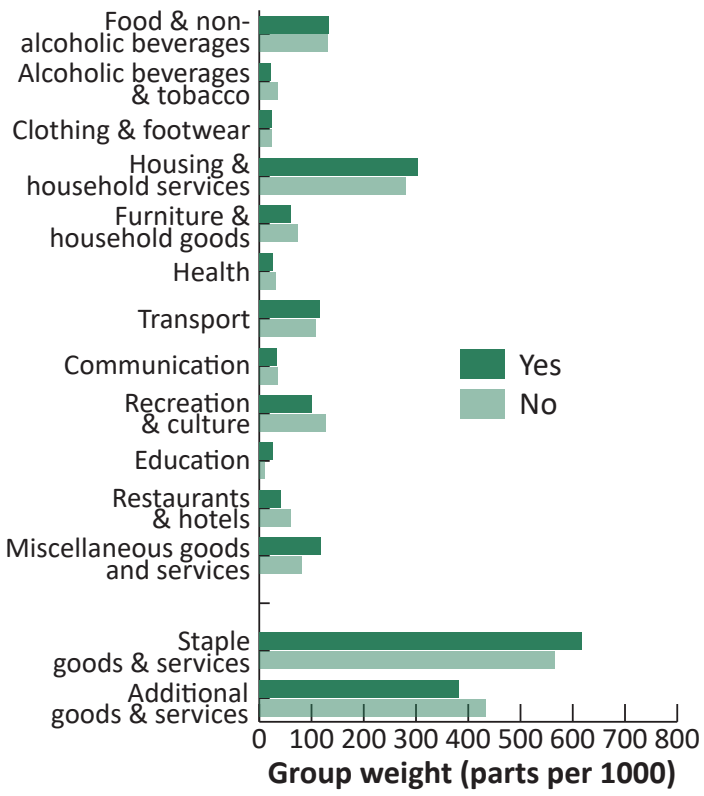


Figure 2.2.3: HCI weights - retired person(s)

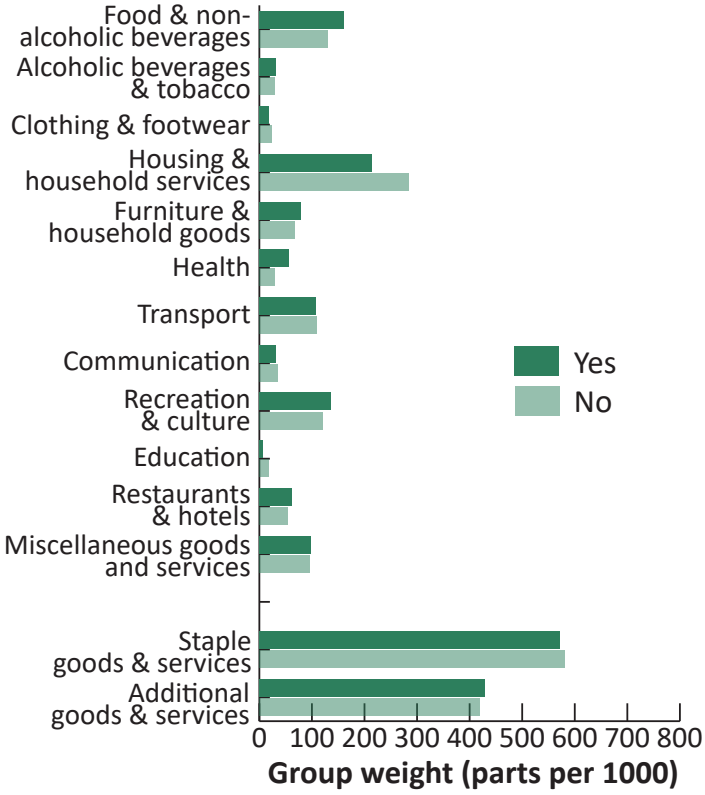


Figure 2.2.4: HCI weights - person(s) with a disability or long term illness that limits their activities

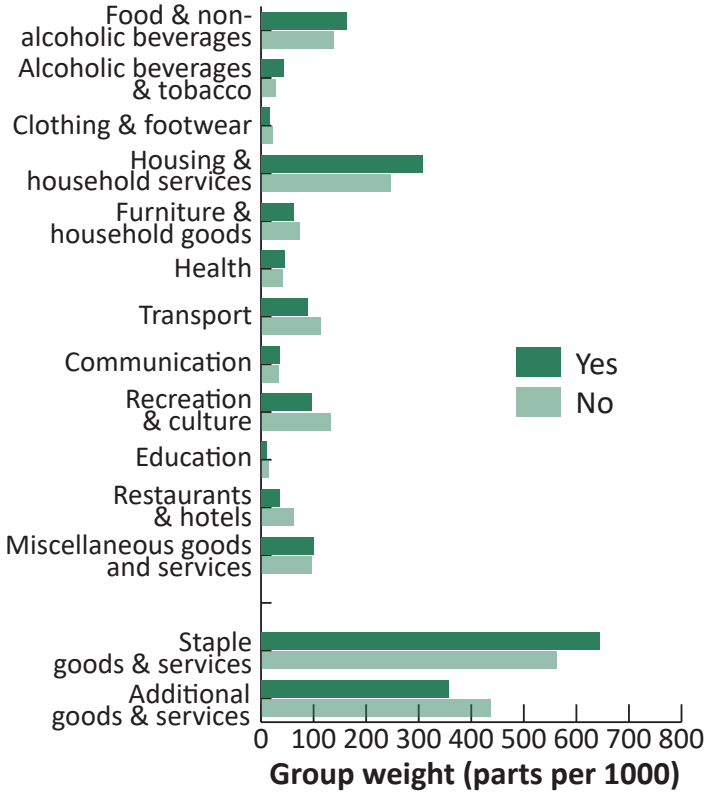


Figure 2.2.5: HCI weights - tenure

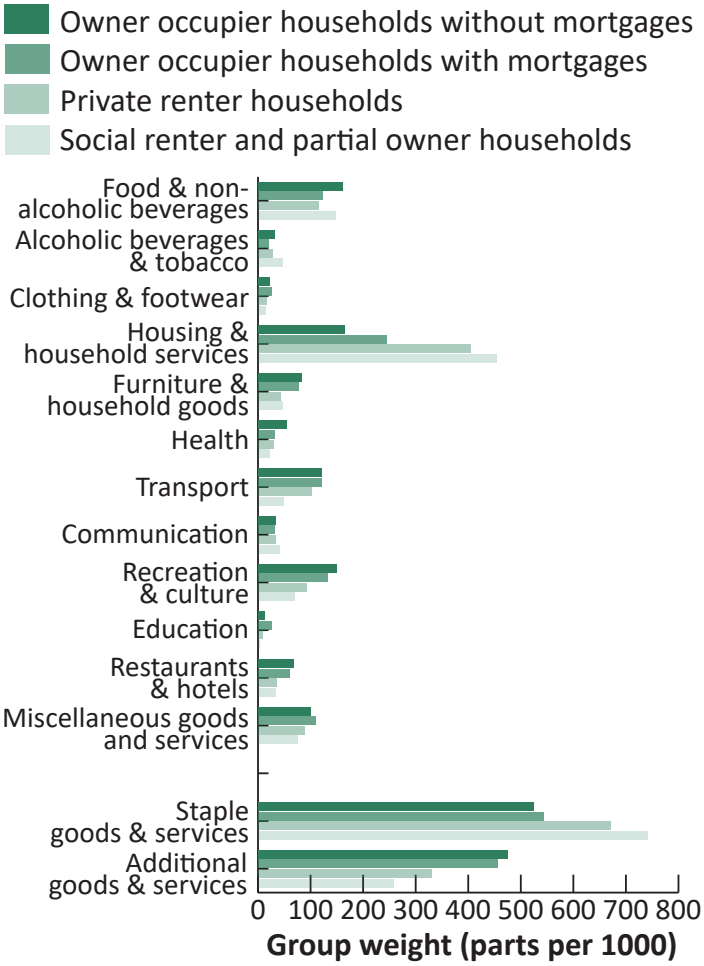
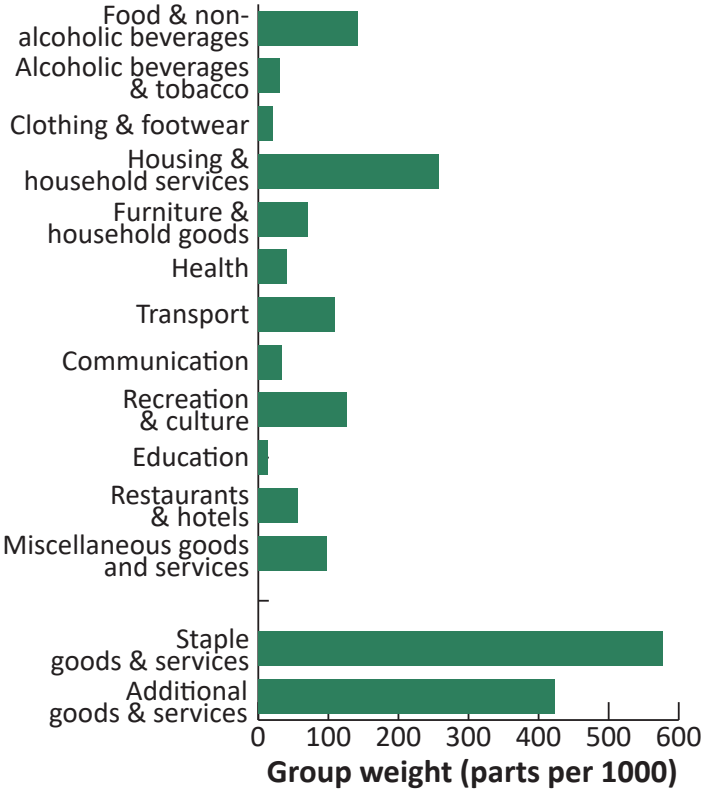


Figure 2.2.6: HCI weights - overall



The HCIs are all calculated using the same basket of goods and services as each other and the RPI. The only difference between each of the HCI calculations is the weighting that is applied. The weights determine the significance (on the overall change in the HCI) of the change in price of each of the goods and services in the basket each quarter. They reflect the different spending patterns of different types of household. For example, as shown in **Figure 2.2.5**, Owner occupier households without mortgages spend a lower portion of their total expenditure on goods and services in the Housing and household services division compared with households with other tenures. This means that they spend a higher portion of their total expenditure across the other divisions than with households with other tenures. The price changes observed each quarter are weighted accordingly when they are combined up into the overall average change for each HCI.

This approach means that the HCIs are directly comparable with each other i.e. the values of the indices differ because of the different spending patterns of different types of household and not for methodological reasons.

The weights themselves are all derived from the results of the Household Expenditure Survey (the same source as is used to determine the weights for the RPIs). They provide insight into the spending patterns of different types of household. However, it should be noted that they represent spending only on goods and services that are "consumed" and not on capital purchases or improvements. All all aspects of spending are captured by the Household Expenditure Survey; see **https://gov.gg/household** for the full survey results.

3.1 Price collection and calculation methods for RPIs and HCIs

Price collection

In order to calculate the RPIs and HCIs, nearly 2,000 prices of goods and services (known as "the basket") are collected each quarter from over 400 local suppliers. Guernsey has no legislation requiring compulsory provision of price data, and as such the consistency and accuracy of the data is reliant on the kind cooperation of local suppliers. Prices are collected by phone, email, from websites and in person. The basket includes a wide range of goods and services, commonly purchased by households in Guernsey.

Direct taxes (those which are typically deducted directly from your wages) are excluded from the basket. Items such as capital payments on mortgage or major home improvements, which are considered to be capital investment, are also not included. Some components of the basket are not used in the calculation of all of the indices (specifically, mortgage interest payments and indirect taxes, such as excise duties levied on fuel, cigarettes and alcohol and property taxes).

Broadly speaking, the same prices are collected from the same suppliers each quarter to ensure the basket always gives a like-for-like comparison. However, there are updates to this as and when items are discontinued, suppliers close and also after each Household Expenditure Survey, when the basket has a bigger overhaul to ensure it continues to include the most popular items and suppliers.

There are enough goods and services in the basket to ensure that even if one price is missing one quarter, there are enough others to reliably calculate the average change at representative item level. If a price is missing in the latest quarter, it is ignored in the data set for the quarter before and vice versa to ensure that comparisons are made between the same items from the same suppliers. Special offers and sale prices are included as these represent genuine price decreases, albeit temporary.

Representative items

The prices collected are used to calculate the average price change from one quarter to the next for nearly 600 representative items (the exact number can change slightly over time). The representative item headings used are internationally comparable, but the items within the basket are specific to Guernsey.

For example, under the representative item title of "rice", prices are collected for basmati rice from two shops and long grain rice from two different shops. These prices are used to calculate the average change in price for rice, since it is not practical to collect the prices of absolutely every different type of rice available for purchase in Guernsey.

Average price changes and weighting

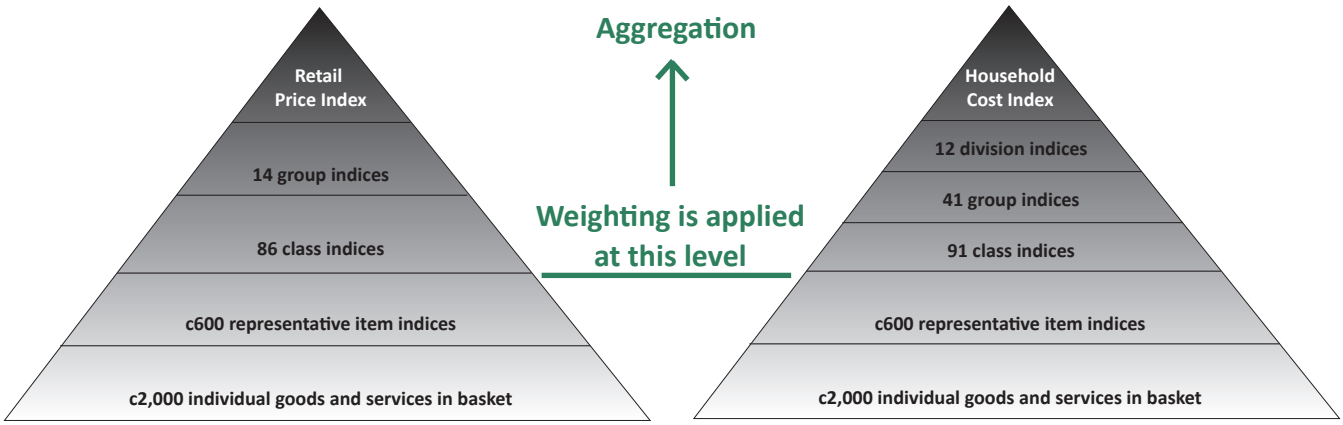
The average change in price over the quarter is calculated for each representative item (as described on the page above) each quarter. These changes are used to update the item indices.

In the case of the RPIs, the item indices are then weighted (using the weights shown in **section 2.1**) and aggregated up into 86 classes, which get aggregated up into 14 groups before being aggregated into an overall index.

For the HCIs, the item indices are then weighted (using the weights shown in **section 2.2**) and aggregated up into 91 classes, which get aggregated up into 41 groups, which get aggregated up into 12 divisions before being aggregated into an overall index.

The stages of aggregation for the RPIs and HCIs are shown in **Figure 3.1.1** below.

Figure 3.1.1: Weighting and aggregation



Methods of averaging and "the formula effect"

There are different methods that can be used to calculate an average change in prices at item level. The three main methods used are: Carli, Dutot and Jevons. The Jevons method assumes that some people modify what they buy to a certain extent when faced with large price increases, whereas Dutot and Carli assume people always buy the same items. Jevons is deemed to most accurately model real behaviours. These different approaches are only applied at item level. Aggregation up through class, group and division level always uses the same approach.

This approach, using Jevons, reflects how a person (during one particular shopping trip) may readily switch to a different brand if their normal brand of item has increased in price a lot at the place they normally shop, but that they would be unlikely to substitute a totally different item (e.g. swapping rice for pasta) and that they would also be unlikely to instantly decide to go to a different shop. Those changes are slower to occur and are built in via the periodic basket review (**page 15**).

The Guernsey RPIs use the Dutot method and the HCIs use the Jevons method. Since January 2022, the difference between the RPI calculated using Dutot vs. Jevons has been published alongside the RPI.

The worked example below shows how the methods differ mathematically.

Table 3.1.2: Worked example

	Item 1	Item 2	Item 3	Item 4	Carli (the average of the price ratios is calculated by summing the ratios and dividing by the number of items)	Dutot (the ratio of the average prices is calculated by summing the prices for each quarter and then working out the ratio of the two sums)*	Jevons (the ratio of the average prices is calculated by working out the geometric mean price for each quarter and then working out the ratio of the two means)
Price Q1	£3.00	£2.03	£2.42	£4.00		The sum of the four prices is £11.45	The geometric mean of the four prices is £2.77
Price Q2	£3.99	£2.00	£2.48	£4.25		The sum of the four prices is £12.72	The geometric mean of the four prices is £3.03
Ratio of Price Q1 : Price Q2	1.17	0.99	1.02	1.06	The sum of the four ratios is 4.40		
Price change between Q1 and Q2					Ratio of 1.10 or +10%	Ratio of 1.11 or +11%	Ratio of 1.09 or +9%

* The same result can be obtained by working out the arithmetic mean price for each quarter and then working out the ratio of the two arithmetic means.

It should be noted that the Dutot formula does not give a consistently higher result than the Jevons formula, but the Carli formula does. In 2015, the **Independent Review of UK Consumer Price Statistics** stated that "Carli should not be used in any index aiming to achieve a good estimate of changes in consumer prices" and "A key result is that the Carli formula for the arithmetic average of price relatives has an upward bias relative to the trend in average item prices." The Carli method (currently used in the UK RPIs, but **due for change in February 2030**) is not used in Guernsey.

Whether the result of the Jevons formula is higher than the result of the Dutot formula will depend on covariances between the individual price quotes from one time period to the next. The Dutot method is influenced by the range of the individual prices in a way that Carli and Jevons are not. The price changes of more expensive products are implicitly given a higher weight than similar price changes for cheaper products. As such, the Dutot method is acceptable only when the set of items priced is homogenous or at least nearly homogenous (something that is achieved via the basket of goods and services, see **page 15**).

The "formula effect" is the term used to describe the difference the method of averaging can have on a calculated average price change. For transparency, the value of the formula effect within the RPIs i.e. the difference between using the Dutot and the Jevons methods is published quarterly alongside the RPIs (which are calculated using the Dutot method). The HCIs use the Jevons method, so are not impacted by the formula effect.

Indexation

All the indices are updated every quarter, including those that started back in 1949. This makes it possible to find out the change in the general price level between any two dates in the time series (even though in practice the goods and services available have changed significantly since 1949). More information on using indices is provided in **section 1**.

Plutocratic vs. democratic calculation of weights

The weights used in the RPIs (as shown in **sections 2.1**) are calculated using a plutocratic approach. For the plutocratic approach, the mean average expenditure on each item (across all households) is calculated and the item's weight is its proportion of the total expenditure. In practical terms, the result is that the higher spending households have greater influence on the weights. This gives an appropriate set of weights to use for indices that represent the whole population. However, a different (democratic) approach to calculating weights is used for measures that relate to specific (and particularly lower income) groups of the population i.e the HCIs (as shown in **section 2.2**). The democratic approach calculates the proportion each household spends of its total expenditure on each item and then takes the average of those proportions. Thus, via the democratic approach, each household has equal influence on the weights.

4.1 The Residential Property Price Indices

There are two residential property price indices for Guernsey that are calculated annually:

Purchase prices (2008 on)
Rental prices (2006 on)

The purchase price index tracks trends in the average capital cost of buying a property (for habitation by a private household). It is published quarterly as a notional value in pounds alongside other information, such as the volume of transactions, the average loan to value and the length of time between the property being advertised and purchased. The index is calculated as the four quarter average for each calendar year.

The rental price index tracks trends in the average cost of renting a property (for habitation by a private household). It is also published quarterly as a notional value in pounds, with the index being updated and published annually.

Both relate to local market properties only and are mix-adjusted; a process by which the average for each group of similar properties is calculated and the weighted average of the changes in those prices is used to calculate the change in the overall index. Mix-adjustment is used to counteract some of the fluctuations that result from there being a different selection of properties that are conveyed or advertised to rent each quarter. This differs to the other price index calculations where a like-for-like basket of goods and services can be priced each quarter, as described in **section 3**.

The seven groups used in the mix-adjustment calculations are listed in **Table 4.1.1** and the weight for each group is shown in parts per 1,000. Properties that do not fit into these groups are excluded from the calculations of the mix-adjusted averages. The weights are derived from the housing stock database, which is a big data system that collates property data from various administrative systems across the States of Guernsey in order to provide a full picture of the housing stock. The weights are updated annually.

A median is used to calculate the average purchase and rental price at group level, due to relatively low volumes of property transactions in Guernsey, which are susceptible to being skewed upwards by occasional very high value properties.

Table 4.1.1: Residential property price indices group weights

	Purchases	Rentals
1 bed apartment	130	360
2 bed apartment	100	232
2 bed house	140	83
3 bed house	216	91
2 bed bungalow	92	77
3 bed bungalow	167	88
4 bed bungalow or house	157	69
Total	1000	1000

Figure 4.1.1: Residential property price indices group weights

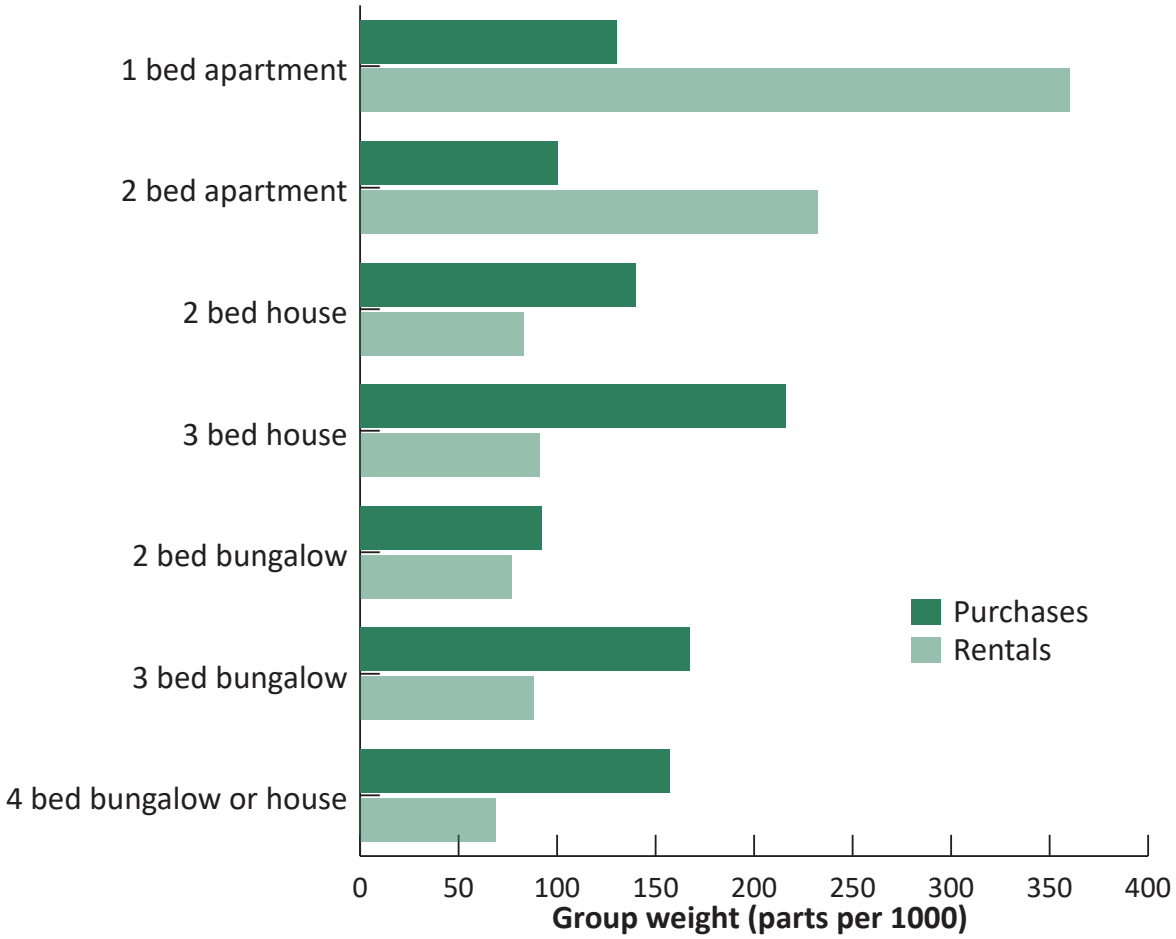


Figure 4.1.1 shows the weight for each group (in parts per 1,000) for property purchases compared with rentals.

In addition to the quarterly Residential Property Price Inflation Bulletin, once each year, a Housing Stock Report is published. This provides an update on properties added to and removed from the stock during the year, as well as other details such as building types and sizes, tenures and the turnover (in terms of sales over the whole year). A price to earnings index and a rent to earnings index, which show how residential property price changes compare with changes in median earnings, are also published. All the publications are available from **https://gov.gg/property**.

5.1 Contact details

If you need assistance with calculations using the indices, would like further details or have any queries, please contact us for further information:

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