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# The Prices of Goods and Services in New Zealand: An International Comparison

By

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## Abstract

This paper analyses the latest (2005) data available from the World Bank's *International Comparison Program* (ICP). It assesses the extent to which the prices of goods and services in New Zealand (NZ) differ from those observed in other OECD countries, and Australia in particular. The main objective is to answer the question: "Are the prices of specific goods and services especially high or low in New Zealand by international standards?" The answer appears to be "yes", leading naturally to the further questions of: "why, and what might the consequences be for prices and productivity in the wider New Zealand economy?"

International price comparisons, even those undertaken carefully such as the ICP, are fraught with difficulties and results should be interpreted cautiously. However, a number of broad features of price levels in NZ relative to other OECD countries stand out. Most prominently, goods and services associated with *investment* in general, and *property*, *construction* and *utilities* (water, gas, electricity) in particular, appear to be relatively expensive in NZ.

Secondly, passenger transport (excluding private motor vehicles), and alcohol & tobacco, prices are high relative to other countries. The former involve transport industries - such as air and rail transport - that are subject to domestic and international regulation, or have some quasi-monopoly power within the NZ economy. In some cases, lack of economies of scale may also be relevant due to the limited size of the domestic NZ market. High alcohol, and especially tobacco, prices appear to be at least partly related to relatively high excise levels in NZ, though this is balanced to some extent by relatively low VAT/GST rates.

Thirdly prices for key exportable products from New Zealand are relative cheap – especially beef/veal/lamb, fish, and dairy products such as butter which may reflect New Zealand's comparative advantage in such goods. By contrast expensive tradable products include poultry, pork and fresh milk

Services that are largely government provided – such as education, health and social protection, and hence are inherently difficult to measure or interpret – are also relatively inexpensive in NZ, reflecting NZ's relatively low average wage levels within the OECD, despite higher intermediate and capital input costs. The large share of wages in total costs in these services make them important determinants of measured (non-market) prices in these activities.

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Special thanks are due to the New Zealand Productivity Commission (NZPC), and especially the Director, Economics & Research, Paul Conway. NZPC sponsored this research and Paul provided much appreciated enthusiastic support and feedback.

## 1. Introduction

It is well-known that cross-country exchange rates can deviate from what are known as purchasing power parity (PPP) exchanges rates. This generally means the following. Take a common representative basket of goods that can be purchased in country A for \$x, and in country B for £y. If applying some prevailing nominal exchange rate between \$ and £ to convert the \$x to £, would not lead to exactly £y, then this exchange rate does not satisfy PPP. That is, the same basket of ‘real’ goods and service cannot be bought in different countries for the same amount of money when that money is converted into a common currency at a ‘nominal’ observed exchange rate. When aggregated to the level of national GDP, this difference between nominal and PPP exchange rates is referred to as differences in ‘national price levels’.

Just as a consumer price index within a country is composed of a weighted average of the prices for individual goods and services, so a national GDP ‘price level’ reflects aggregations of prices for many individual expenditures. International price differences for these individual goods/services need not be uniform; indeed evidence suggests strongly that while some good/service prices are quite similar across countries, others are very different.

This Report examines how far the ‘national price levels’ for different goods/services differ between New Zealand and other countries. It allows such questions to be addressed as:

- Are national price levels – for GDP and/or specific expenditure categories – high or low in New Zealand?
- Since real expenditures are simply nominal expenditures divided by the price of those expenditures, are different price levels in New Zealand, compared to other countries, associated with higher nominal spending, or lower real spending, on specific good and services?
- Why might New Zealand’s prices levels (in general or for specific goods or services) be higher or lower than in other countries?
- Where prices of intermediate goods/services are higher/lower, how might this impact on the productivity performance of downstream activities in New Zealand?
- Specifically, since several non-tradable services, such as transport, property services, wholesale & retail trade, are integral to the delivery of ‘final’ consumer goods, how might price levels for non-tradables used as inputs affect tradable goods/service prices in New Zealand?

Answering these questions can contribute useful insight into New Zealand’s ‘productivity puzzle’ generally as well as specific aspects of service/non-tradables productivity. For example, if the price of New Zealand’s investment goods is relatively high compared to other countries, then a given nominal dollar value of investment in New Zealand will yield less ‘real’ investment than in other countries. And it is *real*, rather than *nominal*, investment that can be expected to be relevant for productivity growth. Secondly, where the prices of non-tradable intermediates are high in New Zealand this will serve to raise the price of tradable final consumer goods and/or exports which use these non-tradables as inputs. Where these tradables are exported (and subject to international price competition) the productivity and competitiveness of New Zealand firms could be adversely affected. For importables, domestic firms may struggle more to compete with imports in final

consumer goods markets, for example, where domestic utility prices impact more on domestic producers than importers. Higher domestic prices for those goods can also reduce consumer welfare directly.

The literature examining international price differences has identified a number of cross-country patterns and characteristics.<sup>1</sup> For example, higher price levels in general, and for services in particular, seem to be correlated with higher per capita income levels across countries. Other things equal, this tends to suggest that New Zealand would be expected to have low overall national, and service, price levels compared to other OECD countries.

More detailed evidence from Falvey and Gemmell (1991, 1995), who looked at underlying factors simultaneously determining both income levels and service prices, suggests that service price levels tend to be higher under a number of economic conditions. These include where capital/labour intensity (endowment) is high, and where population density is high. Both factors tend to raise the price of non-tradable services. In New Zealand's case, with relatively low capital/labour intensity and population density, both these factors again point to relatively low service prices being more likely.

## 2. Project Approach

The approach adopted by this project involved examining 'national price levels', and consumer expenditure data for a range of OECD countries available from the World Bank's International Comparison Program (ICP). These data are collected periodically by the ICP with the aim of measuring prices and expenditures for a basket of comparable goods and service expenditures across the included countries. The latest year for which these World Bank are available is 2005; a subsequent ICP cross-section for 2011 is currently being developed for future release. To allow comparisons across countries, the national price levels (for each category or group of categories) are measured relative to prices in a 'base country'. This is usually the US so that, if there are  $j = 1 \dots J$  individual expenditure categories, then  $P_{j,US} = 1$  for all  $j$ .<sup>2</sup> Hence the ICP prices are referred to as 'international relative prices' for a given expenditure category or aggregation.

For 2005, data are available publicly only for a limited number of around 15 separate sub-aggregations of consumption/investment expenditures across 146 countries, including New Zealand within a 46 OECD/EuroStat country sub-sample.<sup>3</sup> We construct an 'OECD-30 sub-sample of 30 countries that were members of the OECD in 2005 and examine these aggregations in section 4.

The ICP has also made available to this project (under some confidentiality and reporting conditions) more detailed price and expenditure breakdowns for up to 155 separate goods/service

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<sup>1</sup> See, for example, Bhagwati (1984), Falvey and Gemmell (1991, 1995) and references there.

<sup>2</sup> Prices are sometimes reported with a normalisation setting US prices to 100 so all other prices are re-scaled by 100.

<sup>3</sup> In addition to prices for GDP, 5 consumption and investment expenditure aggregates, the publicly available ICP data covers the following 15 good/service sub-aggregates: 1. Food & non-alcoholic beverages; 2. Alcoholic beverages, tobacco and narcotics; 3. Clothing & footwear; 4. Housing, water, electricity, gas and other fuels; 5. Furnishings, household equipment & maintenance; 6. Health; 7. Transport; 8. Communications; 9. Recreation & culture; 10. Education; 11. Restaurants & hotels; 12. Miscellaneous goods & services; 13. Machinery & equipment; 14. Construction; 15. Other products.

categories across the same sample countries. These data are analysed in section 5. A separate paper will examine how far the Falvey-Gemmell ‘underlying factors’ described above help to explain the relative prices of services observed in New Zealand.

To see how the ICP price levels are obtained, consider an individual expenditure item,  $j$ , such as ‘bread’, collected in  $i = 1 \dots N$  countries.<sup>4</sup> Cross country comparisons require a ‘base country’ against which all other countries’ prices, expenditures etc can be compared. For comparisons where the US is the ‘base’ country’, for example, the ratio of the local currency price to the US price (in \$US) for the same item yields the Purchasing Power Parity (PPP) exchange rate for that item. That is:

$$PPP_{i,j}^{us} = \frac{E_{i,j}}{E_{us,j}} \quad (1)$$

where the numerator in (1) is expenditure,  $E$ , on good  $j$  in country  $i$  in local currency, say pounds (£), and the denominator is the equivalent expenditure in the US (in \$US). By comparing this PPP exchange rate with the prevailing nominal exchange rate between £ and \$US, the ICP obtains the price of item  $j$  in country  $i$ , relative to the US price. Thus:

$$P_{i,j}^{us} = \frac{PPP_{i,j}^{us}}{X_j^{us}} \quad (2)$$

where the numerator in (2) is obtained from (1), and  $X_j^{us}$  is the £/\$US exchange rate. For example, ICP data report that the PPP conversion rate for bread in New Zealand compared to bread in the US is 1.39, whereas the nominal exchange rate (for 2005) is 1.42 \$NZ per \$US. Hence the NZ relative price for bread,  $P_{bread,NZ}^{us} = 0.98$  (1.39/1.42), compared to the US price,  $P_{bread,US}^{us} = 1.0$ . That is, in the case of bread in New Zealand relative to the US, the nominal exchange rate is quite close to the ‘real’ PPP rate, or ‘conversion factor’, for bread. Of course, when the PPP for bread in NZ is compared with a composite (suitably weighted) ‘OECD average’ PPP for bread, the difference could be greater (or smaller) depending on the range of PPPs for bread across OECD countries. Similar arguments apply across all individual expenditure items and their various aggregations.

Before examining the ICP data available only for a single year, we begin in section 3 by briefly reporting on the simple but oft-quoted ‘Big Mac’ (BM) Index, data for which is available annually since 1986.

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<sup>4</sup> For an expenditure item such as bread, the ICP method would involve defining a particular type, or types, of bread, such as a loaf of a specific size or weight, etc. Comparable prices in local currency for these items are collected.

### 3. The ‘Big Mac’ Index

The ‘Big Mac’ Index is often quoted in the popular media as a simple way of comparing ‘real’ price differences across countries because it represents a product - MacDonald’s “Big Mac” burger - that is regarded as relatively uniform in quality and quantity across different countries and over time. The UK’s *The Economist* magazine has been publishing data on the BM Index for some years.<sup>5</sup> While this index is anecdotal in the sense that it applies to one specific product, it is available on an annual basis for many countries and Thomas et al. (2008a) find, at least for the US, that the BM Index follows a similar pattern over time to more systematic relative price data for the US.

The BM Index measures the price in absolute US dollars of a Big Mac burger in different countries. Figure 1 shows values for the index for a wide range of countries from 1986 to 2013. It can be seen, for example, that in the 1980s and ’90s, the Big Mac generally varied in price from around (US)\$1 to (US)\$4 in different countries. By 2013, this range had risen to around (US) \$2-7.

The advantage of the BM Index for our purposes is that it allows both New Zealand’s relative price to be identified and how this varies over time – providing a perspective on the ICP data available for 2005 only. For example, Figure 1 indicates that in 1995, the first year for which NZ data became available, NZ ranks 22<sup>nd</sup> out of 33 countries (ranking from highest to lowest prices). In 2004-05, data are available for a much larger number of countries: 65 (the largest of any year so far). In 2005, NZ’s BM Index is the 8<sup>th</sup> highest, at just over \$US3.<sup>6</sup> However by 2013, NZ has fallen to 25<sup>th</sup> highest out of a total of 56 countries with recorded data.

Of particular interest for our ICP comparisons later, Figure 2 shows that New Zealand’s relatively high ranking BM Index in 2005 was at a maximum that year, but was generally high over the mid-2000s. Over 1995 to 2001, around 30-40% of sample countries had a BM Index lower than New Zealand’s. However by 2005, 88% had a lower BM Index than New Zealand’s, with this percentage tending to shrink thereafter to about 55% by 2013.

Comparing Figure 2 with estimates of NZ’s real exchange rate over the period (from Mabin, 2011; see Appendix Figures A1 & A2), confirms that this was a period when NZ’s real exchange rate was especially high. That is, the high nominal exchange rate would tend to raise the ‘price’ of GDP and individual (tradable) products in New Zealand, other things equal. It serves to highlight that, where the overall or average relative price level in NZ (such as the ‘price’ of GDP) appears high, this frequently reflects factors associated with deviations of nominal exchange rates from PPP levels.

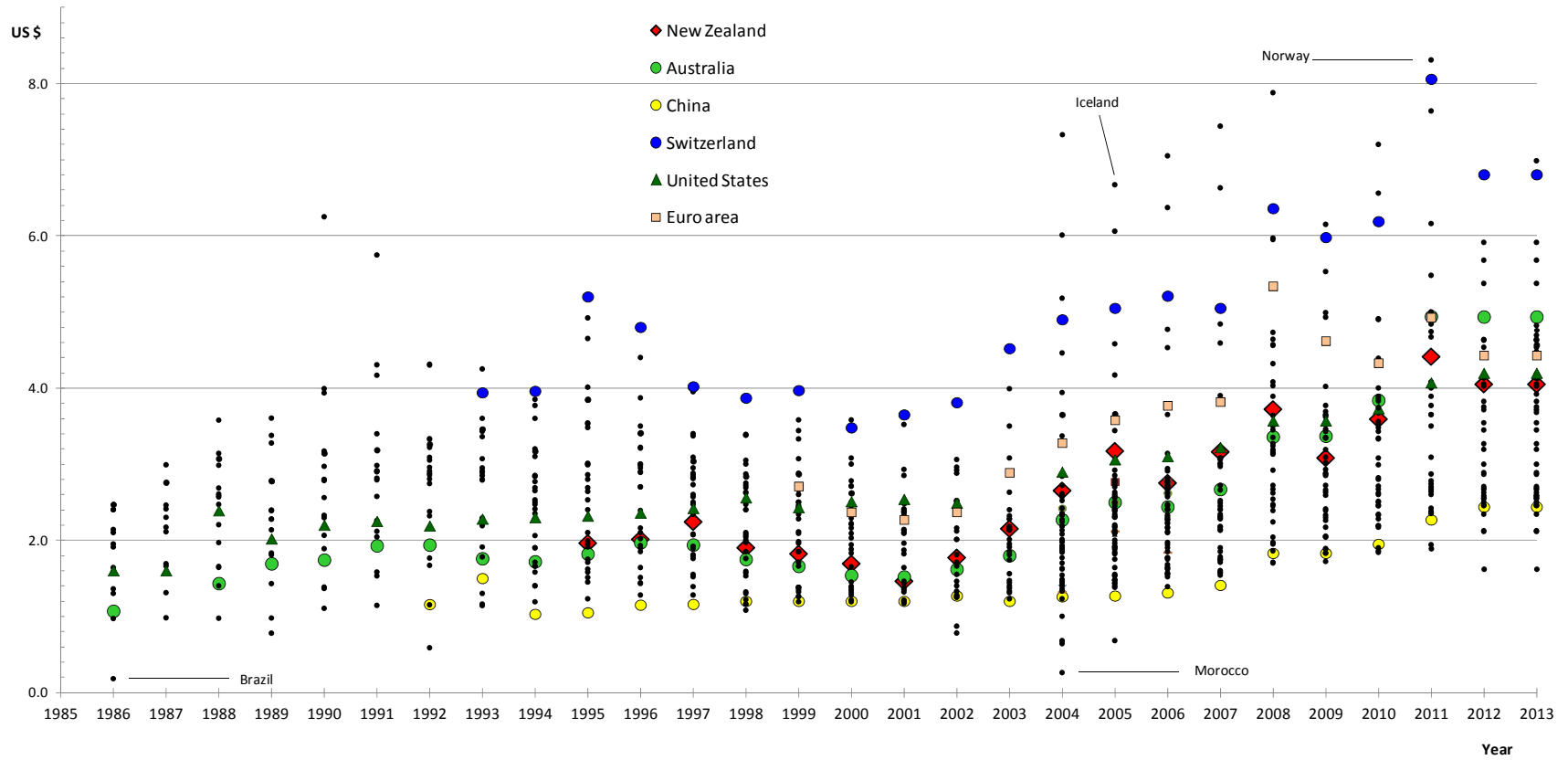
As a result, our price comparisons in sections 4 and 5 will be more concerned with how NZ prices for individual goods and services, deviate from other countries, *relative to similar deviations for GDP*, or other consumption/investment aggregates.

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<sup>5</sup> We have obtained these data for 1986-2013 from <http://bigmacindex.org/>.

<sup>6</sup> This puts NZ lower than the following seven countries (from highest to lowest): Iceland, Norway, Switzerland, Denmark, Sweden, Jordan, Britain; and just ahead of the US in 9<sup>th</sup>. Australia was ranked 22<sup>nd</sup> in 2005 with a BM Index of \$US2.50.

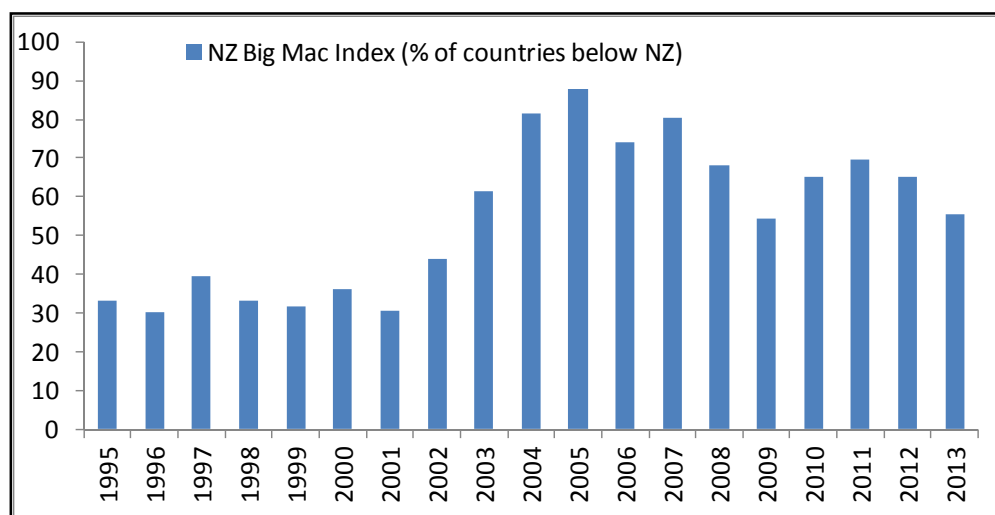
Figure 1 Big Mac Price Across Countries, \$US, 1986-2013\*



\* The Big Mac price (on the vertical axis) refers to the local price of one 'Big Mac' burger, converted to \$US at the prevailing nominal exchange rate.



**Figure 2 NZ's BM Index: Percent of Sample Countries with Lower Values, 1995-2013**



#### 4. New Zealand's Price Comparisons for ICP Sub-Aggregates

The ICP collects data at the consumer, rather than producer, level. This means that the prices recorded are for 'final expenditures' – by consumers or investors. They therefore include any distribution and retail margins, indirect taxes etc. levied on the consumer/investor. It also means that the reported classification of goods and services correspond to those purchased by households, and governments, rather than by the type of production activity. Hence intermediate services – supplied by a service provider to another producer – are not identified in the ICP approach. For example, since consumers do not make final purchases of 'wholesale and retail services' or 'warehousing', these types of service are not separately identified. They are instead included within the prices of 'final' goods and services purchased, and which have used such intermediate services in their production or delivery to the consumer.

The summary data for 2005 published by the ICP is aggregated into the categories shown in Table 1. This broadly matches the expenditure method of calculating GDP with the following classification of prices and expenditures:

- individual (household and government) consumption;
- 'collective consumption' by government (essentially public goods);
- investment (gross fixed capital formation: GFCF); and
- net exports (not shown in Table 1).

Table 1 shows that these are composed of a further set of sub-aggregates of 13 individual consumption expenditure, and 3 investment expenditure, categories.<sup>7</sup> How the various 'levels' or aggregations of expenditure are derived is shown in Figure 3 – with the most disaggregated expenditure categories ('items') at the bottom of the pyramid. They are progressively combined into various sub-aggregates to form GDP at the top of the pyramid. The 'basic heading' (second level from the bottom) is the most disaggregated level of data reported by the ICP.

<sup>7</sup> For more detailed category definitions, see Appendix Table A5.

**Table 1 ICP Summary Expenditure Categories and New Zealand Price Indices, 2005**

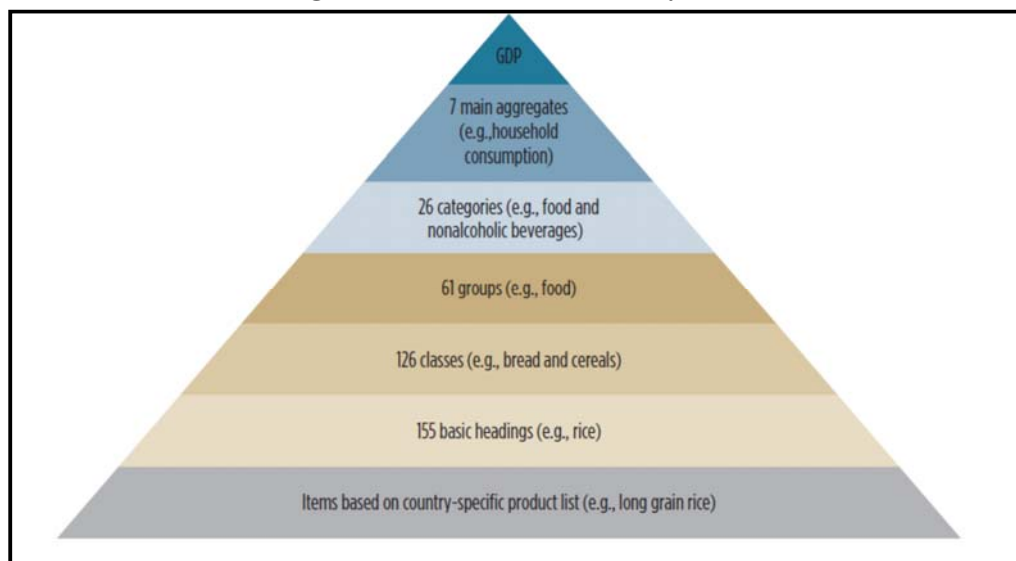
Base Country (=100):	NZ Price levels relative to:			NZ Exp. Shares (%)
	World'	OECD-30	Australia	
<i>GDP</i>	1.34	1.05	1.02	100
<i>Individual consumption</i>	1.28	1.03	1.00	70
<i>Individual consumption expenditure by households</i>	1.29	1.06	1.01	64
1. Food & non-alcoholic beverages	1.47	1.07	1.07	8
2. Alcoholic beverages & tobacco	1.74	<b>1.40</b>	0.97	3
3. Clothing & footwear	1.31	1.11	<b>1.20</b>	3
4. Housing, Water elect gas & other fuels	1.33	1.05	1.05	13
5. Furnishings, h'hold equipment & maintenance	1.32	<b>1.16</b>	1.01	4
6. Health	1.34	<b>0.91</b>	<b>0.91</b>	5
7. Transport	1.20	1.04	0.99	8
8. Communication	1.42	1.09	0.89	2
9. Recreation & culture	1.17	1.08	1.01	8
10. Education	1.60	<b>0.79</b>	1.01	2
11. Restaurants & hotels	1.00	<b>0.90</b>	<b>0.87</b>	4
12. Miscellaneous goods & services	1.15	1.01	0.99	5
13. Net purchases abroad	n.a.	n.a.	n.a.	-
<i>Individual consumption expenditure by government*</i>	1.46	<b>0.85</b>	0.95	6
<i>Collective consumption expenditure by government**</i>	1.46	<b>0.96</b>	<b>0.89</b>	7
<i>Gross fixed capital formation</i>	1.55	<b>1.19</b>	<b>1.15</b>	23
14. Machinery & equipment	1.16	1.12	1.05	9
15. Construction	2.11	<b>1.22</b>	<b>1.19</b>	10
16. Other (GFCF) products	1.50	<b>1.36</b>	<b>1.38</b>	5

\*Black, **bold** values are where prices are substantially higher in NZ than the OECD or Australia; **red, bold** values are those that are substantially lower in NZ. 'Substantial' is defined here as differing by at least  $\pm 10$  percentage points from the relevant  $P_{GDP}$

\*\* Includes government expenditures on housing, health, recreation & culture, education, and social protection

\*\*\* Includes government provision of public goods such as defence, justice etc.; n.a. not available.

**Figure 3 The ICP Data Pyramid**



For each category of spending in Table 1, the three ‘price level’ columns show relative international prices in New Zealand, based on three different normalisations. These normalisations are: (i) where a ‘World’ GDP price (based on an average of the 146 country sample),  $P_{GDP, World}$ , equals 1.0; and (ii) where the equivalent average GDP price in the OECD,  $P_{GDP, OECD} = 1.0$  is used. The OECD comparison is based on a 30-country sub-sample of OECD countries in 2005.<sup>8</sup> (iii) In the third column New Zealand prices are shown relative to Australia, with the Australian GDP price,  $P_{GDP, Australia} = 1.0$ . Results for the latter two normalisations are also displayed in Figure 4. The far right-hand column of the Table shows the share of each of the categories in total expenditure (= GDP) in NZ.

The ‘World’ and ‘OECD-30’ country groupings are based on (GDP-weighted) geometric means across countries for each category. This appears to be the basis of the ‘World’ average produced by the ICP, and the OECD-30 prices have been calculated similarly. A comparison of NZ prices with an unweighted OECD-30 arithmetic mean is discussed in the Appendix.

Table 1 shows that for GDP as a whole, the NZ price level is much higher than the 146 country ‘World’ average (34% higher: 1.34 versus 1.0), but is only about 5% higher than the OECD-30 average and, at 1.02, is hardly different at all from the Australian GDP price of 1.0. As a relatively low per capita income country within the OECD-30 it might be expected that NZ’s overall national price level would be relatively low (since price levels and per capita income tend to be positively correlated). The relatively high overall price level in NZ probably reflects the relatively high nominal (and real) exchange rate for the \$NZ in 2005.

For example, the 2005 exchange rate of \$NZ1.42 = \$US1.0<sup>9</sup> compares with values of over \$NZ2.0 = \$US1.0 during 2000-01 – that is, by 2005 the exchange rate had appreciated by a considerable margin since 2000-01. With a rate in 2012-13 around \$NZ1.22 = \$US1.0, the rate has appreciated around another 15% since 2005. How far this appreciation has affected price levels of individual items in NZ is hard to tell since we do not know how PPPs have changed – via inflation or reductions of individual item prices in NZ relative to the US. However the large \$NZ exchange rate appreciations potentially affect domestic prices across-the-board, and seem likely to have raised prices in NZ compared to the US (recall the ICP price series are obtained by dividing PPPs by the exchange rate – see (2) above). If the overall changes in NZ prices broadly follow the exchange rate changes, then relative NZ prices in general for 2005 would be much higher than their (hypothetical) equivalents around 2000, and a further general rise in prices, from 2005 to today, is also possible.

Given the differences in GDP prices in NZ compared to other countries, Table 1 indicates which goods and service prices tend to raise the overall aggregate and which tend to reduce it. Compared to the OECD, highest prices are associated with alcohol/tobacco (1.40); ‘other (investment) products’ (1.36); construction (1.22); and household furnishings/maintenance (1.16).

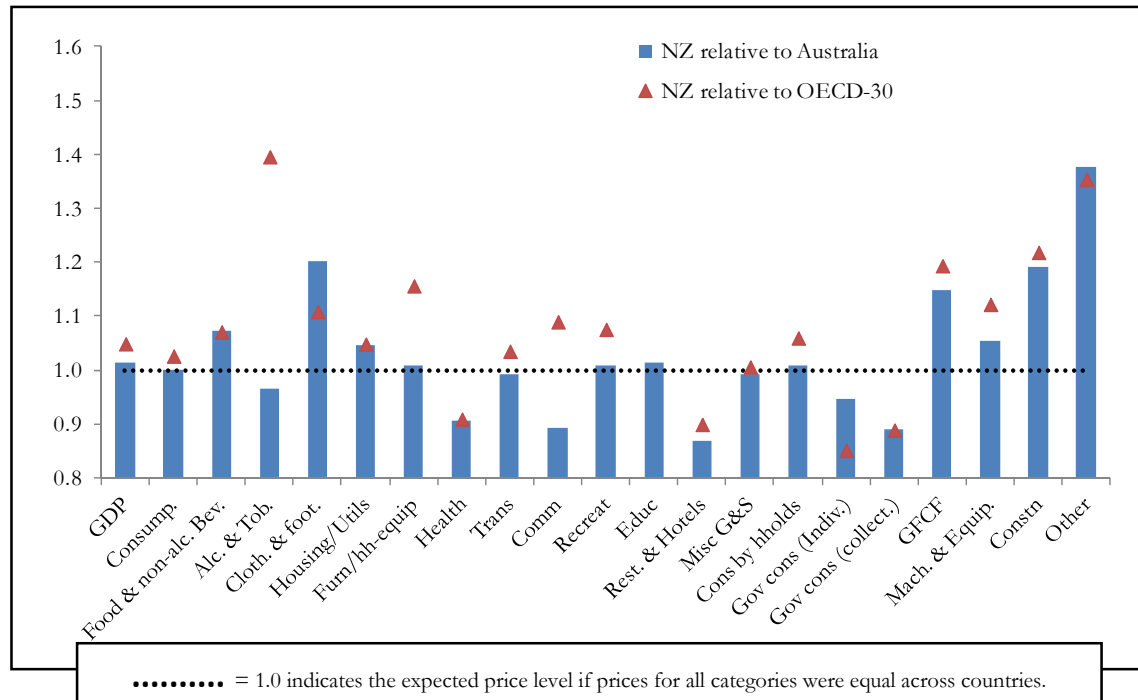
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<sup>8</sup> The ICP data country groupings include a 46 country ‘OECD-Eurostat’ sub-sample, including a number of Eastern European countries. For a list of countries, see World Bank (2013). We exclude these extended Eurostat countries and the three countries who joined the OECD after 2005 (Estonia, Israel, Slovenia), leaving 30 OECD countries.

<sup>9</sup> This is the value adopted in the ICP dataset and is also the average value for 2005 in the RBNZ’s daily exchange rate data at <http://www.rbnz.govt.nz/statistics/>.

Especially low price categories are household expenditures on health and education (0.91 & 0.79 respectively) and similar government-provided ‘individual’ services (health, education, social welfare etc: 0.85), government-provided ‘collective’ services (e.g. defence, justice: 0.89), and restaurants/hotels (0.90).

**Figure 4 New Zealand Price Indices for Summary Expenditure Categories**



The price comparisons in Table 1 and Figure 4 suggest strongly that the main contributors to high prices in NZ are the prices of investment goods such as infrastructure, housing and construction-related spending. More generally, investment and property seem to be expensive in NZ compared to other OECD countries and Australia. Relative to the OECD-30, the low prices for largely government-provided services (education, health, ‘collective consumption’) generally reflect the fact that wage costs in these government services in NZ are relatively low compared to other OECD-30 countries (see section 5). Due to the way national accounts measure these government-produced, labour-intensive services, their ICP international relative prices are substantively determined by their relative wage costs across countries. This ‘low wage cost/labour intensity’ characteristic may also underlie the low price evidence for restaurants/hotels though the data do not provide this breakdown for private services.

Alcohol and tobacco prices in NZ (and Australia) appear very high relative to the OECD-30 average in Figure 4. International differences in the indirect taxation (VAT/GST, excise levels) of these goods often underlie observed differences in consumer retail prices. Some evidence from OECD (2012) suggests that both NZ’s and Australia’s alcohol, and especially tobacco, excise levels are relatively high (though not generally the *highest* for alcohol at least), among OECD countries.<sup>10</sup>

<sup>10</sup> Examining individual country tax data from OECD (2012) suggests that for alcohol excises NZ is ranked around 6-10 among the 25-30 countries for which data are typically available. However, for tobacco (in 2011 at least) NZ is ranked highest of 30. Of course NZ’s relatively low rate of GST/VAT compared to other OECD-30 countries will tend to lower relative prices in NZ. In the ICP data, like NZ, several of the higher income OECD countries display

The difficulties of cross-border shopping by Kiwis and Australians to avoid high excises, compared to many consumers in many European countries and US States,<sup>11</sup> might help explain the high excise levels able to be sustained in NZ and Australia.

Prices in NZ relative to Australia also reveal some substantial differences despite the fact that higher/lower prices broadly cancel out at the aggregate GDP level. In particular, construction/investment prices in NZ again appear high relative to Australia. Household health expenditures and ‘collective consumption’ services, by contrast, are substantially cheaper in NZ, as are restaurant/hotel prices. Unlike the OECD comparison, education spending (by households) does not appear cheaper. We might conjecture that the ‘low wage’ argument above also underlies these government service differences relative to Australia. Surprisingly, ‘clothing & footwear’ seems especially expensive in NZ relative to Australia: the more detailed breakdown into Basic Headings in section 5 suggests this relatively high price in NZ relative to Australia is more associated with footwear than clothing).<sup>12</sup>

Finally, Figure 5 provides more detail on the high price levels in NZ associated with construction in particular, and investment more generally (GFCF), by showing price levels across the countries in the OECD-30 sample. It can be seen that NZ is one of a small number of countries with relatively high values of both investment and construction prices, especially the latter. In particular, NZ’s relatively high price is shared by around 7 Northern European countries: Denmark, Iceland, Ireland, Netherlands, Norway, Sweden and the UK, plus Switzerland.

## **5. Price Comparisons for Goods & Service ‘Basic Headings’**

The most disaggregated data breakdown for expenditure categories provided by the ICP is the so-called ‘Basic Heading’ level (though prices are collected for a lower expenditure ‘item’ level – see Figure 3). There are 155 Basic Headings (BH), though some BH prices have limited interpretation in our context.<sup>13</sup> We have divided these into tradable and non-tradable groupings for presentational purposes based on the BH classification adopted by Thomas et al. (2013).

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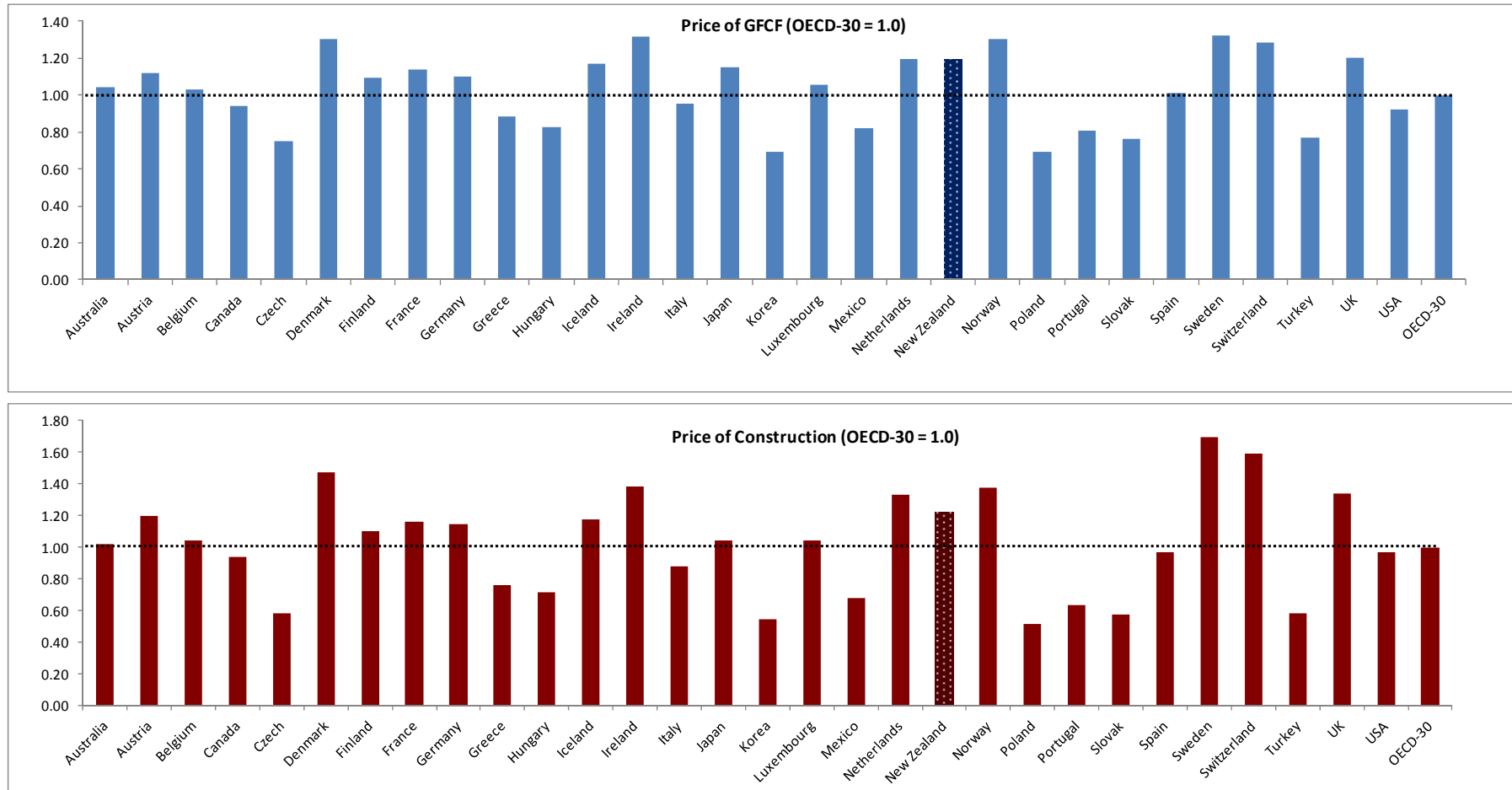
high prices for alcohol and tobacco (e.g. Australia, Canada, Denmark, Finland, Iceland, Ireland, Norway, Sweden and the UK). NZ has the 5<sup>th</sup> highest ICP price for tobacco in the OECD (and ‘world’) samples. Excise data reported in OECD (2012) suggests that these also tend to be the countries with the highest alcohol and tobacco excise rates in the OECD.

<sup>11</sup> Alcohol and tobacco excises are set at the State, not Federal, level in the US.

<sup>12</sup> The high price of footwear is supported by more ad hoc survey evidence; see [http://cbs.db.com/new/pdf/Random\\_Walk\\_Mapping\\_Prices\\_2013.pdf](http://cbs.db.com/new/pdf/Random_Walk_Mapping_Prices_2013.pdf) (Table 9).

<sup>13</sup> For example, we exclude ‘balance of imports and exports’. The ICP describes the classification system thus: ‘The 155 basic headings are combined to form 126 classes. The main aggregation is in the food and non-alcoholic beverages area where 29 basic headings are grouped to form 11 classes. For example, the basic headings fresh milk, preserved milk and other milk products, cheese, and eggs and egg-based products are combined to form the class milk, cheese, and eggs.’ (World Bank, 2013, p.24). See Figure 3 and Appendix Table A1.

Figure 5 Prices of GFCF and Construction in OECD-30



These are shown in Figures 6A and 6B (below) respectively for non-tradables and tradables.<sup>14</sup> The ‘top 25’ highest price differences of BH categories, relative to average OECD-30 values, in each case are shown in Table 2 on page 17. Appendix Table A2 and Figure A6 give the equivalent rankings relative to Australia. Figure 6 plots results for New Zealand and Australia, against the OECD-30 grouping. Hence, a ‘0’ means no price difference between NZ and an ‘average’ OECD-30 value, while a positive number such as 0.5 means the NZ price is 50% higher.

Before discussing the results a number of points about the BH data and definitions are worth noting:

1. Prices for household expenditure items are generally ‘market prices’ and therefore directly observable. Government-provided goods and services however are mainly ‘non-marketed’ and therefore not directly observable. For those ‘comparison-resistant’ items, the ICP has to impute a price, usually based on input costs. The main input costs are: compensation of employees (approximately, ‘wages’), intermediate consumption, gross operating surplus (equal to consumption of fixed capital), and net taxes on products.
2. Where some of those inputs are relatively inexpensive in a country (e.g. because average wages in that activity are low) this will appear in the ICP data as a low price for those goods or services.
3. Similarly a low price for ‘intermediate consumption’ can be interpreted as a low input price to that sector of production (= expenditure), and gross operating surplus (GOS) can be interpreted as the costs of capital inputs (more exactly: the value of provisions for the depreciation of fixed capital inputs). Where total expenditures on an item have a high value or price, but some input costs are low, it can be inferred that the other inputs are relatively expensive. However, it should be remembered that GOS is obtained as a residual and therefore captures any inaccuracies in the measurement of *all* other input costs.
4. The ICP records zero or minimal values for some expenditure items in NZ. This may be because none is bought or (more likely) they are amalgamated with other items and so cannot be separately identified. For NZ these include: ‘water supply & misc. services to dwellings’, ‘financial intermediation services (FISIM)’, ‘combined passenger transport’, and ‘prostitution’. In Table 2 the prices of these items have been ‘greyed out’, and should be ignored for the NZ case.<sup>15</sup>

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<sup>14</sup> We have slightly amended the Thomas *et al.* (2013) groupings by, for example, treating ‘passenger transport by air’ as tradable rather than non-tradable. Inevitably there is some arbitrariness in the tradable (T)/non-tradable (N) split, in part due to limited information on actual economic activity captured by each BH label. The T/N split can be further decomposed into a goods (G) and Services (S) split – again with some arbitrariness associated with different aggregations and definitions. In the ICP dataset, the 70 tradables are mainly Goods (65) plus 5 Service BHs (‘passenger transport by air’, ‘package holidays’, ‘other financial services n.e.c.’, ‘insurance’, and ‘other services n.e.c.’). Of the 56 non-tradables, 50 are predominantly Services, plus 6 Goods BHs (‘electricity’, ‘gas’, ‘civil engineering works’, ‘gardens & pets’, ‘residential buildings’, and ‘non-residential’ buildings).

<sup>15</sup> The ICP nevertheless records PPP values for these items, so that a notional ‘price’ is obtained by dividing by the nominal exchange rate. (PPPs are sometimes obtained for a sub-set of sample countries by imputing values from similar countries where expenditures are available. This may be the case here).

Figure 6A Price Differences for *Non-tradable* Basic Heading Expenditure

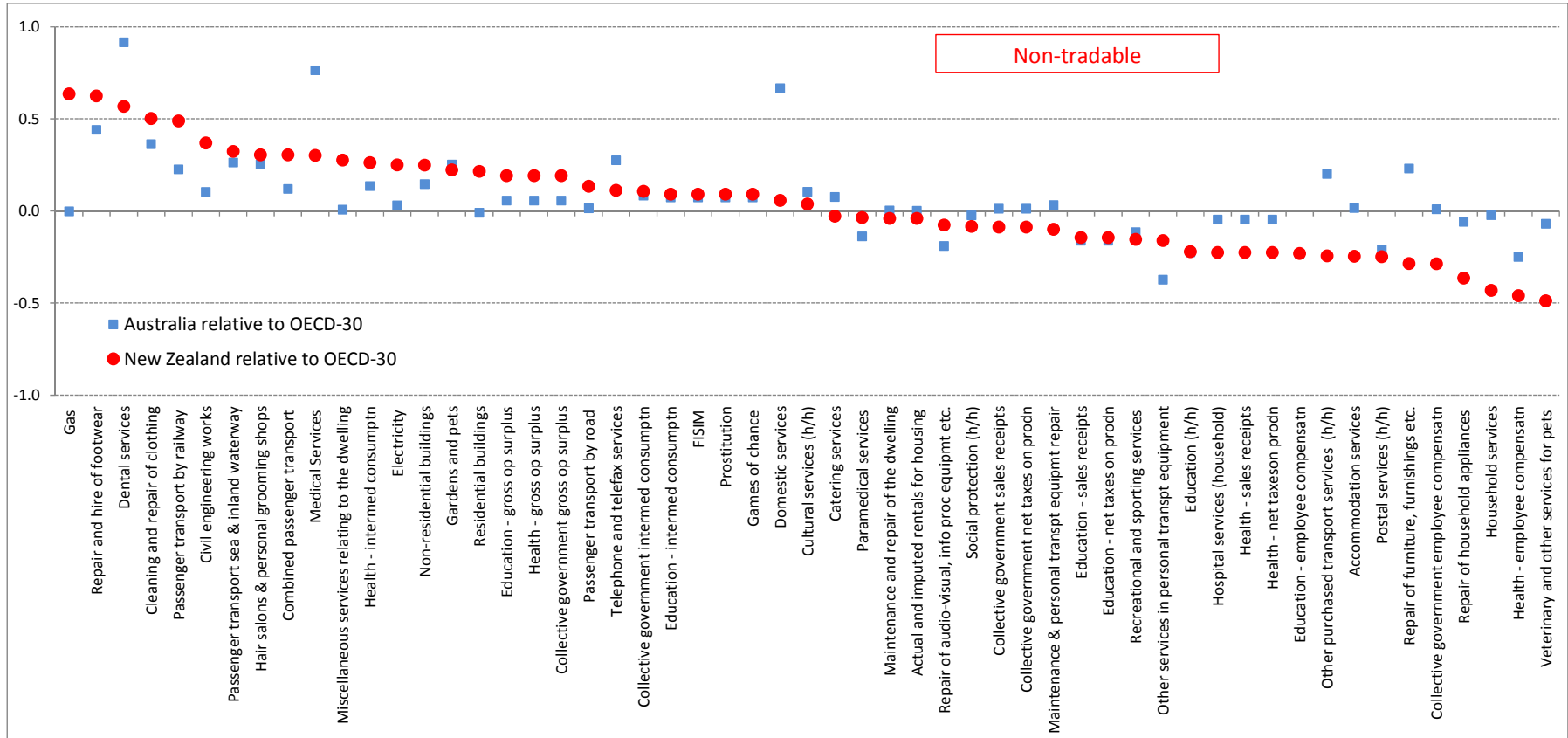




Figure 6B Price Differences for *Tradable* Basic Heading Expenditures



Viewing Figures 6A & 6B with these caveats in mind, some features stand out, including:

- The price differences of the majority of **tradables** in NZ are higher than their OECD equivalents: only 11 out of 70 tradable BH categories have negative price differences in NZ compared to the OECD average. **For non-tradables**, similar numbers of negative and positive BHs price differences (27 out of 56 are negative in NZ).
- A few **tradables and non-tradables** seem to be especially expensive in NZ compared to the OECD on average – at around 0.5 or 50% or more above the OECD. These are shown in Table 2, and include rail transport, gas, medical equipment and tobacco.
- A key message from Figure 6A is that **low wage costs of government-provided services** (‘employee compensation’ in health, education, and collective consumption services) contribute towards lower prices of those services. Their ‘price’ differences are around 0.3-0.5 or 30-50% of the average OECD-30 level. This likely reflects the tendency across the NZ economy for relative wage levels within the OECD to be low. Separate OECD-sourced data in Appendix Figure A4 confirms that NZ was ranked 7<sup>th</sup> lowest out of the OECD-30 countries in ‘labour compensation per employee’ in 2005.
- **Tradables** price differences, display a substantial majority higher in NZ than *Australia*. If we ignore prices within  $\pm 5\%$ , 38 tradables prices are higher in NZ and only 13 higher in Australia. (See Figure A6.2).
- Similar numbers of higher/lower prices of **non-tradables** in NZ compared to *Australia* are observed. If we again ignore price differences within  $\pm 5\%$ , then of the 56 non-tradables, roughly equal numbers are higher and lower in NZ: 19 versus 21; with 16 non-tradables prices within  $\pm 5\%$  of each other. (See Figure A6.1).

As noted earlier, the tendency for many tradables price differences in NZ to display values greater than their OECD counterparts in 2005 may partly reflect the temporarily high exchange rate observed in NZ in the mid-2000s – relative to long-run trend. However, with NZ’s exchange rate continuing to record similarly high values in recent years (after a brief downturn during the global financial crisis – see Appendix Figures A2 and A3 – the 2005 values shown in Figure 6 may well continue to be broadly representative of NZ’s relative prices.<sup>16</sup>

This factor will also tend to raise non-tradables price differences in NZ relative to the OECD within this ICP dataset – because *all* category PPPs are divided by the nominal exchange rate. However, because NZ appears to have a number of especially low priced – mainly government-provided - non-tradables, the relatively high exchange rate by historical standards is insufficient to push these non-tradable prices above the OECD average.

Among the few (11) of the 70 tradable BH price differences that are *negative* in NZ relative to the OECD-30, NZ’s main agricultural products appear to be prominent, including ‘fish and seafood’ (-0.05), ‘beef & veal’ (-0.12), ‘butter & margarine’ (-0.26), and ‘lamb, mutton & goat’ meat (-0.39) – see Figure 6B.

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<sup>16</sup> For example, the RBNZ’s trade weighted index (TWI) exchange rate for New Zealand averaged 70.4 in 2005 but was even higher at 72.5 in 2012 and 75.8 for 2013 (1 January to 26 September). The TWI is based on a value of 100 in June 1979.

**Table 2 Basic Headings with Highest Price Differences Relative to OECD-30**

	Top 25 Non-tradables	Price differences vs. OECD-30	Exp. Share (%)	Top 25 Tradables	Price differences vs. OECD-30	Exp. Share (%)
1	Water supply	<b>2.02</b>	0.0%	Therapeutical appliances and equipment	<b>0.83</b>	0.2%
2	<b>Gas</b>	<b>0.63</b>	0.2%	<b>Tobacco</b>	<b>0.65</b>	1.2%
3	Repair and hire of footwear	<b>0.62</b>	0.0%	<b>Major household appliances</b>	<b>0.62</b>	0.6%
4	Dental services	<b>0.57</b>	0.3%	Eggs and egg-based products	<b>0.60</b>	0.1%
5	Cleaning and repair of clothing	<b>0.50</b>	0.0%	<b>Carpets and other floor coverings</b>	<b>0.52</b>	0.2%
6	<b>Passenger transport by railway</b>	<b>0.49</b>	0.1%	<b>Other fuels</b>	<b>0.51</b>	0.0%
7	<b>Civil engineering works</b>	<b>0.37</b>	2.9%	<b>Passenger transport by air</b>	<b>0.40</b>	1.7%
8	<b>Passenger transport sea &amp; inland waterway</b>	<b>0.32</b>	0.1%	Confectionery, chocolate and ice cream	<b>0.38</b>	0.5%
9	Hair salons & personal grooming shops	<b>0.30</b>	0.4%	Fresh or chilled potatoes	<b>0.38</b>	0.1%
10	Combined passenger transport	<b>0.30</b>	0.0%	Other products	<b>0.36</b>	1.7%
11	Medical Services	<b>0.30</b>	1.5%	<b>Spirits</b>	<b>0.34</b>	0.4%
12	Miscellaneous dwelling services	<b>0.28</b>	0.0%	<b>Wine</b>	<b>0.31</b>	0.6%
13	<b>Health - intermed consumption</b>	<b>0.26</b>	1.1%	Food products n.e.c.	<b>0.29</b>	1.1%
14	<b>Electricity</b>	<b>0.25</b>	1.5%	Preserved milk and milk products	<b>0.28</b>	0.2%
15	<b>Non-residential buildings</b>	<b>0.25</b>	2.9%	Footwear	<b>0.27</b>	0.3%
16	Gardens and pets	<b>0.22</b>	0.7%	Other edible oils and fats	<b>0.27</b>	0.1%
17	<b>Residential buildings</b>	<b>0.21</b>	6.8%	Newspapers, books and stationery	<b>0.26</b>	1.1%
18	<b>Education/health/collective govt - GOS</b>	<b>0.19</b>	1.3%	Other medical products	<b>0.26</b>	0.2%
19	<b>Passenger transport by road</b>	<b>0.13</b>	0.3%	Other personal effects	<b>0.25</b>	0.3%
20	<b>Telephone and telefax services</b>	<b>0.11</b>	1.5%	<b>Furniture and furnishings</b>	<b>0.25</b>	1.3%
21	<b>Collective gov. intermed consumption</b>	<b>0.11</b>	3.9%	<b>Beer</b>	<b>0.25</b>	0.8%
22	<b>Education - intermed consumption</b>	<b>0.09</b>	1.3%	Jewellery, clocks and watches	<b>0.24</b>	0.2%
23	FISIM	<b>0.09</b>	0.0%	Audio-visual, info processing equipmt	<b>0.24</b>	1.1%
24	Prostitution	<b>0.09</b>	0.0%	Cheese	<b>0.24</b>	0.2%
25	Games of chance	<b>0.09</b>	1.6%	Non-durable household goods	<b>0.23</b>	0.6%
	<b>TOTAL</b>		28%			15%

Note: 1. 'FISIM' = Financial intermediation services indirectly measured; 'Other products' are an *investment* expenditure.  
2. Residential and non-residential building expenditures are mainly measured by actual and imputed rentals.

Table 2 focuses on the 'top 25' tradable and non-tradable BH price differences. These generally bear out the messages from the less detailed data in section 4, but also an interesting difference with respect to transport prices. In Table 2, BH categories relating to property/investment are highlighted in **bold**, with transport-related prices highlighted in **red**. Government service price categories are highlighted in **blue**, and alcohol/tobacco price categories are highlighted in **green**.

It is clear from the table that high price differences for a number of property-specific and utility (both electricity and gas) expenditures contribute to the high NZ construction and investment prices identified in section 4. Building prices (rents) themselves are also high at around 0.20-0.25 or 20-25% higher than OECD-30 values for equivalents, and the relatively high value of 0.37 for the price of 'civil engineering works' is suggestive of high infrastructure costs.

The table reveals, from the red bold highlighted expenditures, that several transport expenditures appear expensive in NZ. This applies largely to *passenger* transport by any mode – rail, road, sea or air.<sup>17</sup> Some fuels also appear high on the price list (at position '6' among the 70 tradables). This can be expected to affect other goods/service prices via input costs if these 'final consumer' prices also apply broadly to intermediate uses.<sup>18</sup> The reason why these high passenger transport prices appear not to feed through to an especially high price of transport overall in Table 1, is because motor vehicle prices are relatively low in the rankings. For example, 'motor cars' and

<sup>17</sup> In general the ICP is not able to identify freight services because typically these are not final' expenditures.

<sup>18</sup> One reason why this may *not* be the case is the impact of fuel excise duties which can be especially high for final consumers.

‘motor cycles’ have relatively low prices (see Figure 6A) as have ‘other personal transport services’ (Figure 6B).

This broadly suggests that ‘personal’ private transport by motor vehicle is relatively inexpensive in NZ,<sup>19</sup> compared to the prices of all ‘public’ passenger transport modes. Notably ‘passenger transport by air’ is especially highly priced in NZ (at 0.4 or 40% above OECD-30 average prices) but it is even higher in Australia (at 0.66 or 66% above the OECD-30). The lack of a genuinely internationally competitive environment for this so-called ‘tradable’ travel category in NZ-Australia seems a plausible candidate explanation for the high price differences.

Table 2 also confirms the earlier evidence that, among tradables, alcohol/tobacco price differences are relatively high. This applies especially to tobacco (rank: 2<sup>nd</sup> highest), but also to spirits (rank: 11<sup>th</sup> highest), wine (12<sup>th</sup>), but less so for beer (21<sup>st</sup>).

Table 2 indicates that the relative international price differences of some food expenditures are high in NZ: such as eggs (4<sup>th</sup>), confectionary (8<sup>th</sup>) and some dairy products; similarly household expenditures on health-related items (medical services and products, dental services) are among the highest priced BHs relative to the OECD.

Finally, a key message from Table 2 is that many of the more expensive BH items in NZ, as well as being final expenditures, are likely to be important inputs into other goods/services production. This includes the main investment goods of construction, buildings and civil engineering, but also utilities (gas, electricity) and transport. In addition, the evidence of high prices for the intermediate inputs and GOS (capital costs) of government services, is suggestive that an important factor behind high ‘final’ prices of a number of other items (especially tradables) is likely to be the higher input costs they face.

## 6. New Zealand’s Input-Output Relationships

The previous section identified such expenditures as construction, property, utilities, transport and telecoms as relatively high priced in New Zealand. We also suggested that, as well as contributing to final consumption and investment, these largely non-tradable activities are also likely to feature as inputs into other parts of the economy’s activities. To the extent that the observed high prices for final expenditures also imply relatively high prices for intermediate sales, these high prices can affect the final prices of other goods and services in New Zealand.

Differences across goods and services in indirect tax rates, wholesale, retail and distribution margins can mean that the pass-through of these additional costs to final expenditures can be different across activities. In New Zealand, with the exception of excises on specific items, the broad base of GST tends to produce relatively uniform indirect taxes across domestic activities. For the other margins, we are not aware of any evidence on inter-industry differences.

However, using the 2007 Statistics New Zealand input-output table for NZ – the closest available to our ICP data year - it is interesting to consider the relative importance across industries of the activities that we have identified as relatively expensive in terms of final expenditures. For

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<sup>19</sup> One reason for this may be NZ’s relatively large number of used vehicles: “...the average age of our light fleet, 13.2 years, is high by international standards” Martin Matthews, Chief Executive, Ministry of Transport (see [http://www.transport.govt.nz/assets/Import/Documents/\\_versions/4043/The-NZ-Vehicle-Fleet-2012.1.pdf](http://www.transport.govt.nz/assets/Import/Documents/_versions/4043/The-NZ-Vehicle-Fleet-2012.1.pdf)).

those activities/industries, Table 3 shows their share in (i) domestic sales of intermediates to other industries (i.e. excluding imports), (ii) gross fixed capital formation; and (iii) the total economy (total output).

**Table 3 Shares of Some Sectors in the New Zealand Economy (Percent, 2007)**

Industry	Sales to industry	GFCF	Total economy
Electricity generation and on-selling	3.6%	0.2%	2.2%
Electricity transmission and distribution	1.3%	0.3%	0.8%
Gas supply	0.5%	0.0%	0.3%
Water supply	0.4%	0.0%	0.2%
<b>UTILITIES TOTAL</b>	<b>5.8%</b>	<b>0.6%</b>	<b>3.6%</b>
Residential building construction	0.8%	23.1%	2.3%
Non-residential building construction	1.2%	10.3%	1.4%
Heavy and civil engineering construction	1.7%	14.7%	2.3%
Construction services	5.5%	13.3%	3.8%
<b>CONSTRUCTION TOTAL</b>	<b>9.3%</b>	<b>61.4%</b>	<b>9.8%</b>
Road transport	2.9%	0.0%	1.6%
Rail transport	0.2%	0.0%	0.1%
Other transport	0.3%	0.0%	0.2%
Air and space transport	0.8%	0.0%	1.4%
Transport support services	1.0%	0.4%	0.9%
<b>TRANSPORT TOTAL</b>	<b>5.2%</b>	<b>0.4%</b>	<b>4.3%</b>
Postal and courier pick-up and delivery services	1.2%	0.0%	0.6%
Telecommunications services including internet service providers	2.3%	0.9%	2.0%
<b>TELECOMS/POSTAL TOTAL</b>	<b>3.5%</b>	<b>0.9%</b>	<b>2.6%</b>
Residential property operation	0.0%	0.0%	1.6%
Non-residential property operation	4.6%	0.1%	2.2%
Real estate services	1.2%	4.2%	0.9%
Owner-occupied property operation	0.0%	0.0%	4.4%
<b>TOTAL PROPERTY</b>	<b>5.8%</b>	<b>4.2%</b>	<b>9.2%</b>
<b>TOTAL of above</b>	<b>30%</b>	<b>67%</b>	<b>29%</b>

Source: Inter-industry transactions; year ended March 2007. Statistics New Zealand Input-Output Table, 2007.

The table shows that these 5 sectors (utilities, construction, transport, property and telecoms) contributed around 30% of intermediate inputs and of total output in the NZ economy. They also contributed around 67% of total domestic investment (GFCF) – of which construction alone contributed over 60 percentage points.<sup>20</sup> These relatively large shares of intermediates and, especially investment, for the five sectors, imply that if these sectors do indeed experience relatively high prices, and if these apply at the input, as well as final output, level, then they could result in relatively higher prices in a substantial fraction of down-stream activities. This seems most likely to be relevant for investment goods and activities, with construction forming such a large fraction of all economy-wide investment, and property also a relatively large contributor to intermediate input use and investment.

<sup>20</sup> These shares are percentages of *domestic* activities – excluding imports. For GFCF, imports account for around 25% of all GFCF, with the 5 sectors shown contributing around 50%.

## 7. Conclusions

This paper has sought to analyse the extent to which the prices of goods and services in New Zealand differ from those observed in other OECD countries, and Australia in particular, based on data available from the World Bank's *International Comparison Program* (ICP). The main objective of the paper was to answer the questions: "Are the prices of specific goods and services especially high or low in New Zealand by international standards?"

International price comparisons, even those undertaken carefully such as the ICP, are fraught with difficulties, largely associated with achieving comparability across countries and definitions of goods and service expenditures for which prices are to be compared. As a consequence, the resulting relative price series should be interpreted cautiously. Nevertheless, a number of broad features of NZ price levels relative to OECD countries stand out.

Most prominently, goods and services associated with *investment* in general, and *property, construction* and *utilities* (gas, electricity) in particular, appear to be relatively expensive in NZ. Together with (relatively expensive) transport and telephone services, these items also often form intermediate inputs to production of final goods and services.

Secondly, passenger transport (excluding private motor vehicles) prices are high relative to other countries. The former involve transport industries - such as air and rail transport - that are often subject to domestic and/or international regulation, or have some quasi-monopoly power within the NZ economy. In some cases, lack of economies of scale may also be relevant due to the limited size of the domestic NZ market.

Thirdly, alcohol & tobacco prices are high relative to other OECD countries. Separate evidence from the OECD (for 2011) suggests this may be related to relatively high excise duty levels in NZ, especially for tobacco. NZ alcohol excises are ranked around 6-10 out of 30 or so OECD countries, with tobacco excise ranked highest in 2011.<sup>21</sup> Key NZ export products, such as meats and dairy, appear among the lower priced categories.

Services such as education, health and social protection are largely government-provided, and hence prices for these are inherently difficult to measure or interpret. Their intermediate and capital input components appear relatively expensive in NZ. However, for most of those services, labour input costs are by far the largest share and NZ has relatively low average wage levels within the OECD (Figure A4). Wage costs in these services in NZ therefore tend to drive down the measured (non-market) prices for these 'comparison-resistant' activities, relative to most other OECD-30 countries.

This comparative price evidence raises the question of what links there might be to productivity levels in New Zealand, relative to other countries. While this paper cannot examine these in detail, the previous analysis suggests a number of relevant factors.

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<sup>21</sup> It may have been somewhat lower in 2005 – since a substantial increase in tobacco excise occurred in the 1020 Budget.

- The high relative price of investment, property, construction etc. in NZ seems unlikely to be due to relatively high wages in NZ in those activities: as we have noted average wage rates are relatively low in NZ by OECD standards.
- This, in turn, suggests that the price of *capital and/or land inputs* are more likely to lie behind the evidence of the high ‘final’ expenditure prices for investment/construction/property.
- This is borne out by the ICP data on government-provided services of health, education social protection etc., where labour input costs are confirmed as low by international standards but intermediate and capital costs appear high.
- As noted above, utilities (water, gas, electricity), transport and property are also likely to be important intermediate inputs into many other final goods and services. While ICP ‘final expenditure’ prices for these need not necessarily be reflected in intermediate input prices, there is a strong *prima facie* case that these input prices could also be high. If so, this will tend to raise costs across a wide range of tradable and non-tradable goods and services, including exports, produced in NZ. This would tend to inhibit real productivity levels and competitiveness of NZ-produced goods and services both at home and abroad.
- These high-priced inputs are generally non-tradable or, at best, subject to only limited international competition. This will also serve to raise the price of NZ’s *tradables*, both exports and for the domestic market, above those in other OECD countries (other things held constant). This, in turn, can make NZ exports *and import-competing* goods and services uncompetitive.
- Arguably these relatively high input prices can act as a spur to NZ firms to innovate in order to achieve compensating productivity gains in other elements of their business. However, this might generally be expected to ameliorate, rather than eliminate, the disadvantage NZ firms face via higher intermediate prices. It can also encourage the out-migration of firms and industries for which these high-priced inputs are a large fraction of their total costs.

*Why* the key non-tradables (and many tradables) that we have identified as ‘high-priced’ have such high prices is, of course, a much harder question to answer and cannot be adequately addressed here. We have hypothesised some possible sources, such as excise taxation, industry regulation, distance from markets and some possible monopoly power in some industries. In the case of utilities – within the highest priced expenditure category, aspects of geography and climate (e.g. affecting hydro-electric power prices) may also be relevant.

Importantly, this limited analysis cannot tell us whether relatively high prices for some non-tradables are a likely to be a *source* of low NZ productivity, or a *consequence* of low NZ productivity, or both. Further, with some of those non-tradables likely to be important inputs into NZ’s tradables production, the same argument could apply to tradables. That is, low tradables productivity may both cause, and follow from, high domestic final prices of tradables.

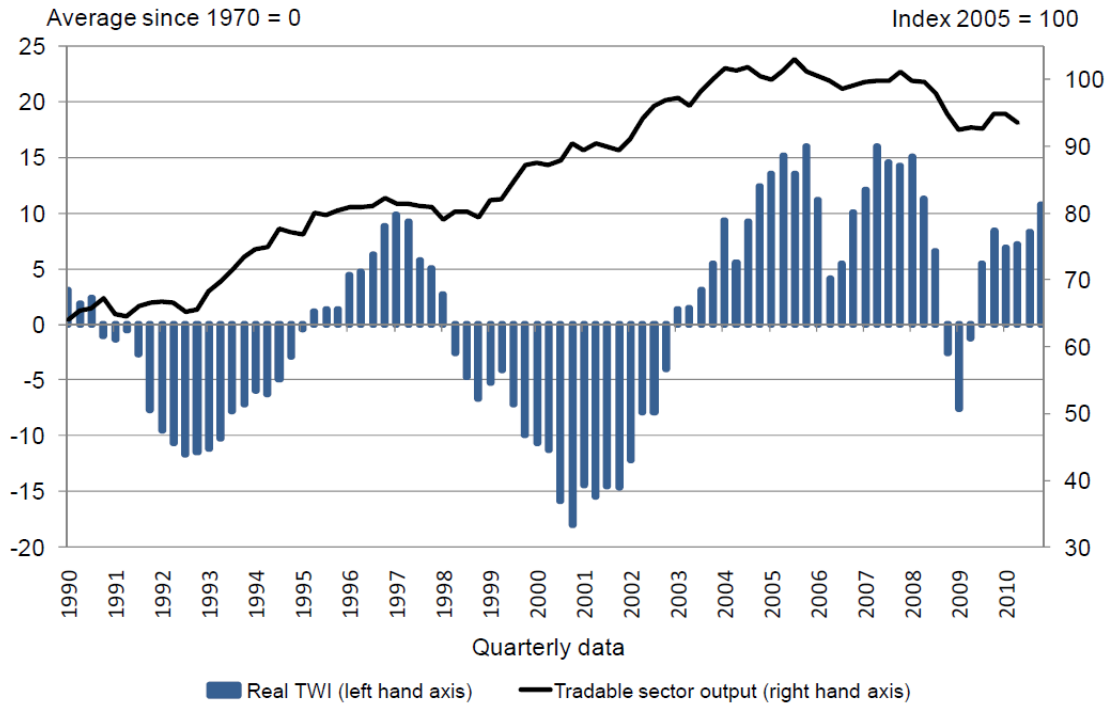
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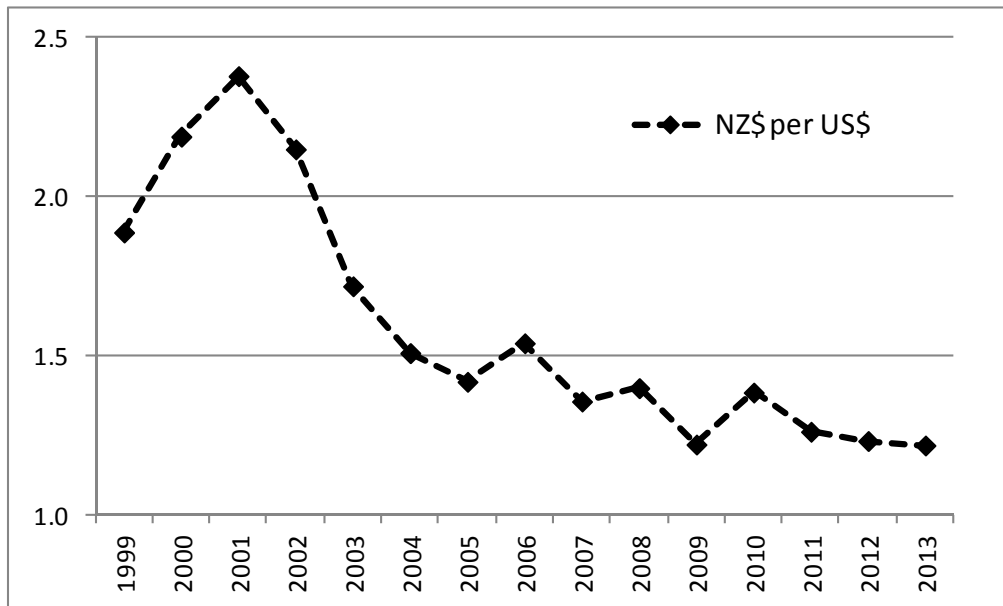
## Appendix

**Figure A1** New Zealand's real effective exchange rate (real TWI) 1990-2010.



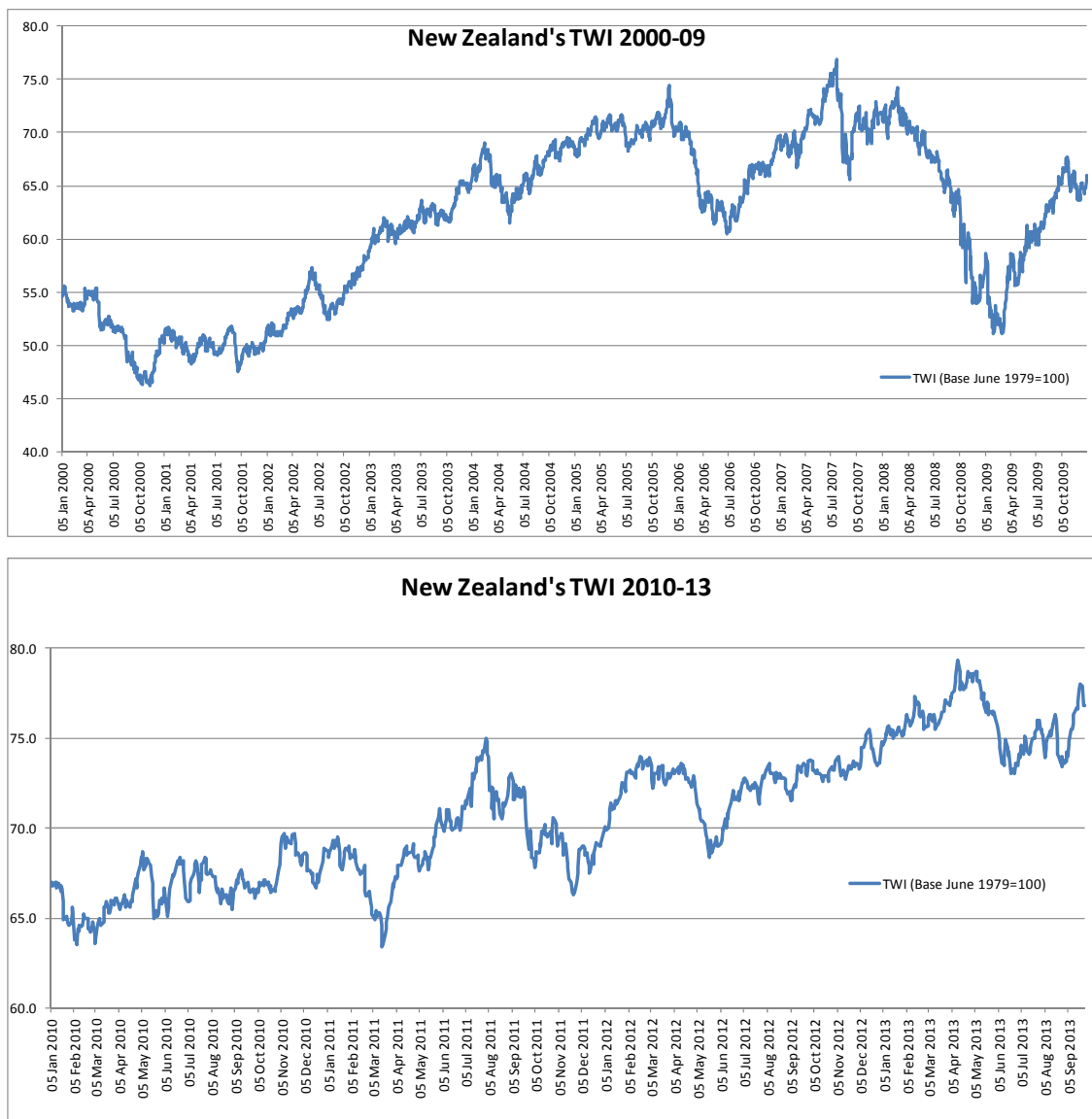
Source: Mabin (2011)

**Figure A2** New Zealand's Average Annual Exchange Rate against the US\$ (1999-2013)



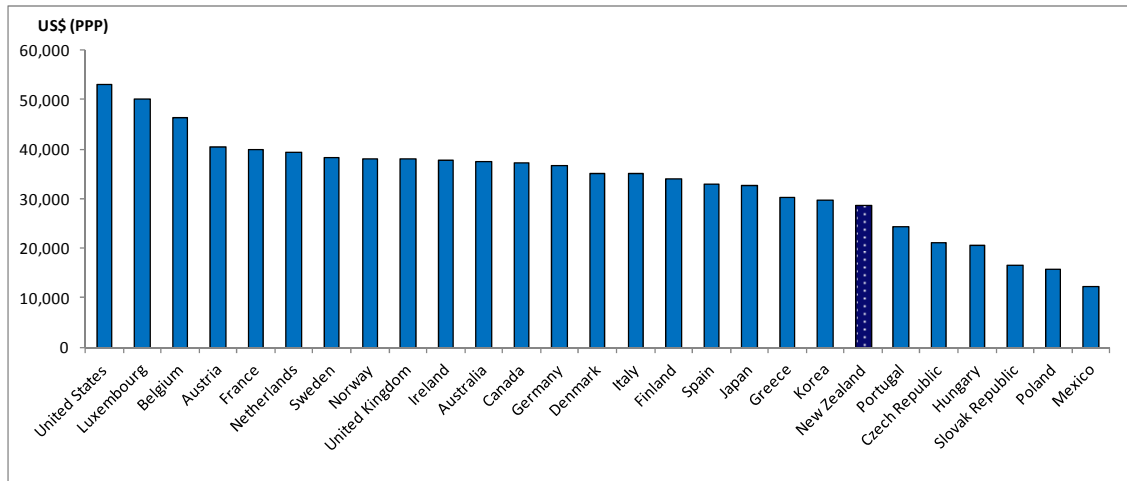
Source: RBNZ website (<http://www.rbnz.govt.nz/statistics/>, accessed 26-09-13).

**Figure A3 New Zealand's Trade-Weighted Exchanges Rate Index (TWI), 2000-13**



Source: RBNZ website (<http://www.rbnz.govt.nz/statistics/>, accessed 26-09-13).

**Figure A4 Labour Compensation per Employee (in US\$, PPP-adjusted): 2005**



Source: OECD StatExtracts at [http://stats.oecd.org/index.aspx?DatasetCode=EAR\\_MEI#](http://stats.oecd.org/index.aspx?DatasetCode=EAR_MEI#) (Accessed on 03/10/13).

**OECD-30: Weighted versus Unweighted Means**

The data provided by the ICP has a number of country regional aggregations obtained as weighted geometric means of individual country values. A replication for the EOCED-Eurostat 46-country ‘region’, using the summary categories in Table 1, suggests that geometric and arithmetic means for GDP prices are almost identical to each other and the published ICP value. For the GDP compositions in Table 1, using a GDP-weighted mean, that geometric or arithmetic, produces values that are similar to but not identical with the ICP values. We use these geometric GDP-weighted values in the analysis in this paper. For comparative purposes, the chart below repeats Figure 4 in the text, but compares NZ with an unweighted OECD-30 average. It can be seen that, with a few exceptions (e.g. Transport, Restaurants/hotels) the comparison are quite similar.

**Figure A5 Weighted versus Unweighted Means**

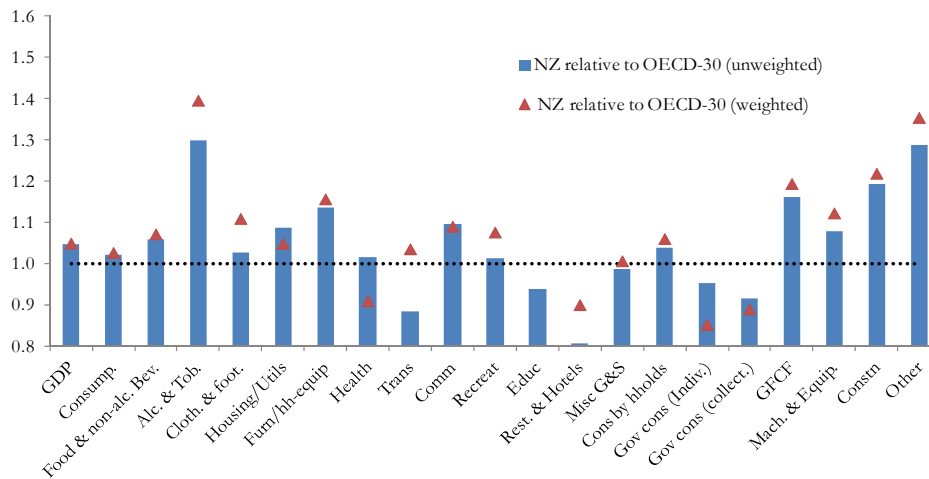


Figure A6.1 Price Differences for *Non-tradable* Basic Heading Expenditures Relative to Australia

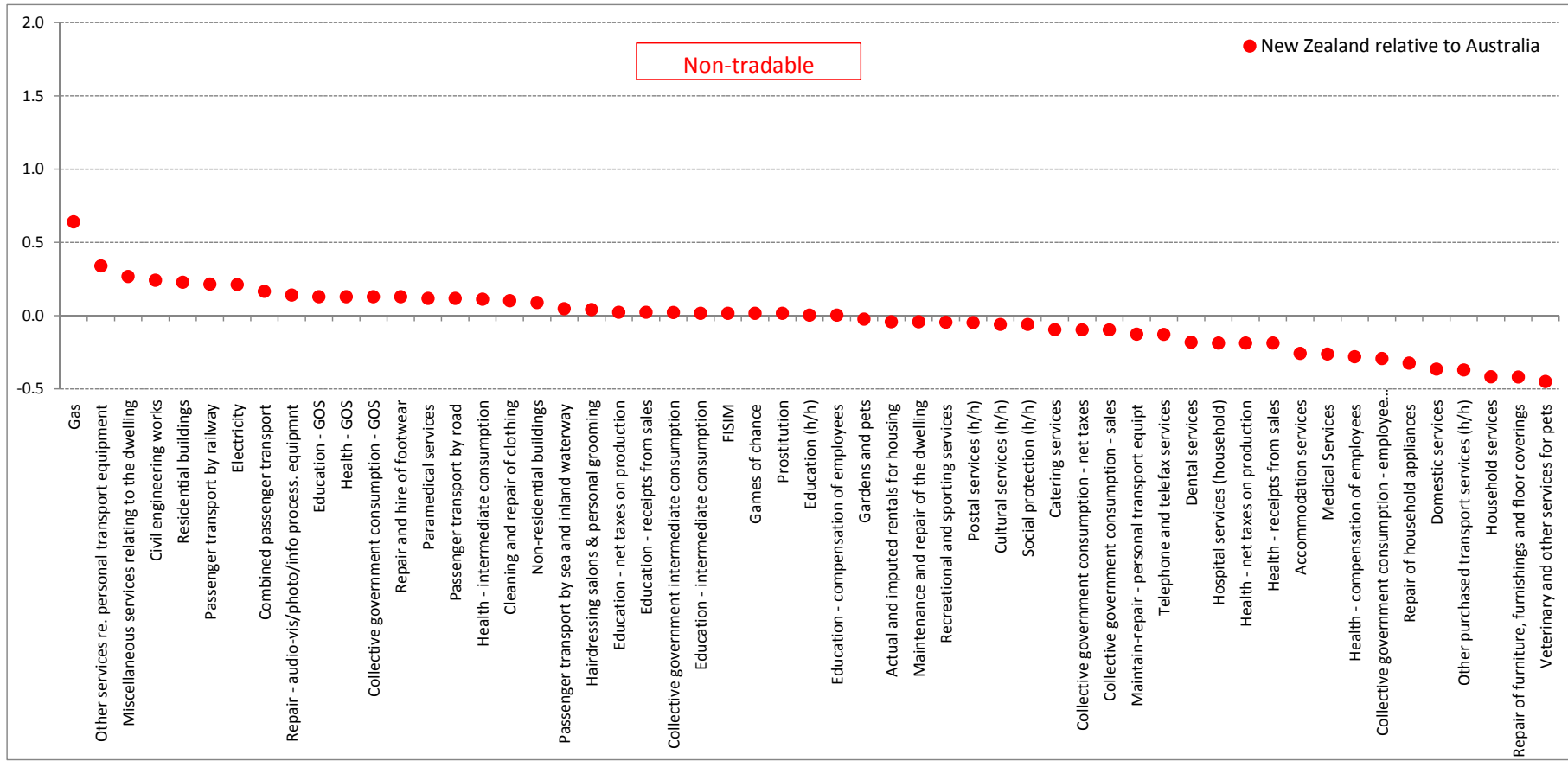


Figure A6.2 Price Differences for *Tradable* Basic Heading Expenditures Relative to Australia



**Table A1 Main ICP Aggregates and Basic Headings**

<b>Main aggregates</b>	<b>No. of basic headings</b>
<i>Individual consumption expenditure by households</i>	110
01 Food and nonalcoholic beverages	29
02 Alcoholic beverages, tobacco, and narcotics	5
03 Clothing and footwear	5
04 Housing, water, electricity, gas, and other fuels	7
05 Furnishings, household equipment, and maintenance	13
06 Health	7
07 Transport	13
08 Communication	3
09 Recreation and culture	13
10 Education	1
11 Restaurants and hotels	2
12 Miscellaneous goods and services	10
13 Net purchases abroad	2
<i>Individual consumption expenditure by NPISH</i>	1
<i>Individual consumption expenditure by government</i>	21
01 Housing	1
02 Health	12
03 Recreation and culture	1
04 Education	6
05 Social protection	1
<i>Collective consumption expenditure by government</i>	5
<i>Gross fixed capital formation</i>	12
01 Machinery and equipment	8
02 Construction	3
03 Other products	1
<i>Change in inventories and acquisitions less disposals of valuables</i>	4
01 Change in inventories	2
02 Acquisitions less disposals of valuables	2
<i>Balance of exports and imports</i>	2
<i>GDP</i>	155

Source: World Bank 2008, appendix C.  
 Note: NPISH = nonprofit institutions serving households.

Source: World Bank (2013, p.25)

**Table A2 Top 25 Basic Heading Price Differences Relative to Australia**

	Top 25 Non-tradables	Price differences vs. Australia	Exp. Share (%)	Top 25 Tradables	Price differences vs. Australia	Exp. Share (%)
1	Water supply	1.89	0.0%	Jewellery, clocks and watches	0.83	0.2%
2	Gas	0.64	0.2%	Footwear	0.65	0.3%
3	Other services in personal transpt equipment	0.34	0.5%	Jams, marmalades and honey	0.62	0.1%
4	Miscellaneous services relating to the dwelling	0.27	0.0%	Pharmaceutical products	0.60	0.3%
5	Civil engineering works	0.24	2.9%	Recording media	0.52	0.2%
6	Residential buildings	0.23	6.8%	Other fuels	0.51	0.0%
7	Passenger transport by railway	0.22	0.1%	Other products	0.40	1.7%
8	Electricity	0.21	1.5%	Food products n.e.c.	0.38	1.1%
9	Combined passenger transport	0.17	0.0%	Cheese	0.38	0.2%
10	Repair of audio-visual, info proc equipmt etc.	0.14	0.0%	Small electric household appliances	0.36	0.2%
11	Education/health/collective govt - GOS	0.13	1.3%	Poultry	0.34	0.4%
12	Repair and hire of footwear	0.13	0.0%	Glassware, tableware and household utensils	0.31	0.2%
13	Paramedical services	0.12	0.5%	Other meats and preparations	0.29	0.9%
14	Passenger transport by road	0.12	0.3%	Beef and veal	0.28	0.4%
15	Health - intermed consumptn	0.11	1.1%	Fresh or chilled potatoes	0.27	0.1%
16	Cleaning and repair of clothing	0.10	0.0%	Major household appliances	0.27	0.6%
17	Non-residential buildings	0.09	2.9%	Other medical products	0.26	0.2%
18	Passenger transport sea & inland waterway	0.05	0.1%	Major tools and equipment	0.26	0.0%
19	Hair salons & personal grooming shops	0.04	0.4%	Furniture and furnishings	0.25	1.3%
20	Collective government intermed consumptn	0.02	3.9%	Carpets and other floor coverings	0.25	0.2%
21	Education - intermed consumptn	0.02	1.3%	Clothing materials and accessories	0.25	0.6%
22	FISIM	0.02	0.0%	Newspapers, books and stationery	0.24	1.1%
23	Games of chance	0.02	1.6%	Pork	0.24	0.1%
24	Prostitution	0.02	0.0%	Other edible oils and fats	0.24	0.1%
25	Education (h/h)	0.00	2.4%	Non-durable household goods	0.23	0.6%
	<b>TOTAL</b>		28%			11%

**Table A3 Category Definitions: Aggregations of Basic Headings**

**GDP (gross domestic product)**, expenditure-based, is total final expenditures at purchasers' prices, including the f.o.b. value of exports of goods and services, less the f.o.b. value of imports of goods and services. Figures are provided by national authorities participating in ICP and may differ from international organizations' figures.

**Actual individual consumption** is measured by the total value of household final consumption expenditure, non-profit institutions (such as NGOs and charities) serving households' final consumption expenditure, and government expenditure on individual consumption of goods and services (such as education or health).

**Food and non-alcoholic beverages** include food products and non-alcoholic beverages purchased for consumption at home; excludes food products and beverages sold for immediate consumption away from the home by hotels, restaurants, cafés, bars, kiosks, street vendors, automatic vending machines, and so forth; cooked dishes prepared by restaurants for consumption off their premises; cooked dishes prepared by catering contractors, whether collected by the customer or delivered to the customer's home; and products sold specifically as pet foods.

**Alcoholic beverages and tobacco** include alcoholic beverages purchased for consumption at home; includes low or non-alcoholic beverages that are generally alcoholic such as non-alcoholic beer; excludes alcoholic beverages sold for immediate consumption away from the home by hotels, restaurants, cafés, bars, kiosks, street vendors, automatic vending machines, and so forth. It also includes all purchases of tobacco by households, including purchases of tobacco in cafés, bars, restaurants, service stations, and so forth.

**Clothing and footwear** includes expenditures on clothing materials; garments for men, women, and children; other articles of clothing and clothing accessories; cleaning, repair, and hire of clothing; all footwear for men, women, and children; and repair and hire of footwear.

**Housing, water, electricity, gas, and other fuels** includes expenditures on actual and imputed rentals for housing; maintenance and repair of the dwellings; water supply and services related to the dwellings; and electricity, gas, and other fuels.

**Furnishings, household equipment, and maintenance** includes expenditures on furniture and furnishings; carpets and other floor coverings; household textiles; household appliances; glassware, tableware, and household utensils; tools and equipment for house and garden; and goods and services for routine household maintenance.

**Health** includes expenditures by households on medical products, appliances and equipment, outpatient services, and hospital services. It also includes expenditures by government on health benefits and reimbursements and on production of health services.

**Transport** includes expenditures on purchase of vehicles, operation of personal transport equipment, and transport services.

**Communication** includes expenditures on postal services and on telephone and telefax equipment and services.

**Recreation and culture** includes expenditures on audio-visual, photographic, and information-processing equipment; other major durables for recreation and culture; other recreational items and equipment; gardens and pets; recreational and cultural services; newspapers, books, and stationery; and package holidays.

**Education** includes expenditures by households on pre-primary, primary, secondary, postsecondary, and tertiary education. It also includes expenditures by government on education benefits and reimbursements and on production of education services.



Category Definitions (continued):

**Restaurants and hotels** includes food products and beverages sold for immediate consumption away from the home by hotels, restaurants, cafés, bars, kiosks, street vendors, automatic vending machines, and so forth; cooked dishes prepared by restaurants for consumption off their premises; cooked dishes prepared by catering contractors, whether collected by the customer or delivered to the customer's home. It also includes expenditures on accommodation services provided by hotels and similar establishments.

**Miscellaneous goods and services** include expenditures on personal care, personal effects, social protection, insurance, and financial and other services.

**Individual consumption expenditure by households** includes the actual and final consumption expenditure incurred by households on individual goods and services. It also includes expenditure on individual goods and services sold at prices that are not economically significant.

**Individual consumption expenditure by government** includes the actual and imputed final consumption expenditure incurred by general government on individual goods and services.

**Collective consumption expenditure by government** consists of expenditures incurred by general and local governments for collective consumption services such as defence, justice, general administration, and the protection of the environment.

**Gross fixed capital formation** is measured by the total value of a producer's acquisitions, less disposals, of fixed assets during the accounting period, plus certain additions to the value of non-produced assets (such as subsoil assets or major improvements in the quantity, quality, or productivity of land) realized by the productive activity of institutional units.

**Machinery and equipment** includes fabricated metal products, general purpose machinery, special purpose machinery, electrical and optical equipment, transport equipment, and other manufactured goods.

**Construction** covers the construction of new structures and the renovation of existing structures. Structures include residential buildings, non-residential buildings, and civil engineering works.

**Other products** include products of agriculture, forestry, fisheries, and aquaculture, as well as software products.

Source: World Bank (2008) - 'Table of Results'; footnotes to Table 2, p.46.

## About the Author

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