14. Measuring Economic Progress[1]

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1. The Evolution of the International League Table

Economists have been inquiring into the nature and causes of the wealth of nations for centuries,[3] but the regular and systematic construction of official quantitative measures of relative economic progress is a phenomenon of recent decades. A key role in this transformation was played by Colin Clark, who held that '[c]omparisons of economic welfare between one community and another, one economic group and another, and between one time and another, are the very framework of economic science' (Clark 1951: 16).

Clark's Joseph Fisher Lecture in Commerce at the University of Adelaide in 1938 was a milestone, because it was in this lecture that the idea of using the national accounts framework to express the average incomes of countries at a common price level was first developed and applied. Drawing upon material from what was his forthcoming book, *Conditions of Economic Progress,*[4] Clark attempted to quantify 'the absolute levels of economic progress so far achieved in different countries'. He explained that this was a difficult statistical task consisting 'in essence...of measuring the real national income of the countries concerned, which amounts to the same thing as the actual equivalent of goods and services produced...*measured at an international price level*' (Clark 1938: 9, emphasis added).

In the course of the lecture, Clark presented estimates of the average income per occupied person at work in various countries in 1936 or 1937, measured in international units of purchasing power (IUs). One IU equalled the average amount of goods and services purchasable with one American dollar, over

the period 1925-1934. According to these calculations, the highest average real income per occupied person at that time was in New Zealand (2,040 IUs), followed in order by the United States (1,948 IUs), Great Britain (1,402 IUs) and Australia (1,363 IUs).[5]

The significance of Clark's pioneering work in comparing average income levels in different countries at international price levels has now been recognised.[6] In the 1990s however, inter-country comparisons of real product and incomes are no longer the province of individual scholars. The United Nations International Comparison Program (ICP), which began in 1967, has developed into a world-wide statistical enterprise which aims at obtaining internationally comparable data on total and per capita gross national product (GNP), by taking account of the purchasing power differences of the currencies in which national estimates were originally compiled.[7] In 1985, the ICP conducted a benchmark exercise, the results of which were published in 1994 (UN 1994).[8] For this phase of the ICP (Phase V), comparisons were initially made within six regions or country groups: Africa, the Caribbean, Asia and the Western Pacific, the EEC, a broader European grouping comprising the European Comparison Program (ECP), and the OECD. Since each study employed the same technique, regional results could be linked to form a global comparison if a country was represented in more than one of the regions, or through bilateral comparisons between two countries belonging to different regions. The global framework of this exercise is illustrated in Figure 1.[9]

In the *World Bank Atlas 1995*, ICP results were extended to non-participating countries, and extrapolated to 1993 for participating countries, in order to present, for around 130 countries, a new measure of GNP per capita converted at purchasing power parity (PPP). This PPP-based measure was designed to offer '...an alternative view of a country's income level relative to others *by using international prices to value domestic production'* (World Bank 1995: 2, emphasis added).[10] According to the World Bank's rankings (the current official 'league

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5   See Clark (1938: 9) for further details.

6   See Arndt (1979: 121-124) and references cited therein.

7   See United Nations and Commission of the European Communities (1994), hereafter referred to as UN (1994).

8   Organisations participating in various aspects of the benchmarking exercise included the World Bank, the University of Pennsylvania, the Statistical Division of the United Nations Secretariat (UNSTAT), the Statistical Office of the European Communities (EUROSTAT), the Organisation for Economic Co-operation and Development (OECD), the Economic Commission for Europe (ECE), the Economic and Social Commission for Asia and the Pacific (ESCAP) and the Austrian Central Statistical Office.

9   For a detailed exposition see UN (1994: 9-19).

10   However, readers are asked to note that '...because of differing statistical systems and methods of collection among economies, the indicators are *not always strictly comparable* in coverage and definition' (World Bank 1995: 2, emphasis added). It was not made clear, however, that the range of error involved in the PPP estimates is far greater, and the conceptual issues raised are far more formidable, than in the case of other country indicators published by the Bank (such as the demographic characteristics of countries, their exports and imports, or the industrial origin of their GNPs). Nor was it mentioned that the responsibility for

table'), the relative average income levels of the 25 richest countries in 1993 were as shown in Table 1: the bracketed figures show the rankings in the late 1930s, according to the estimates given by Clark in his Joseph Fisher Lecture.
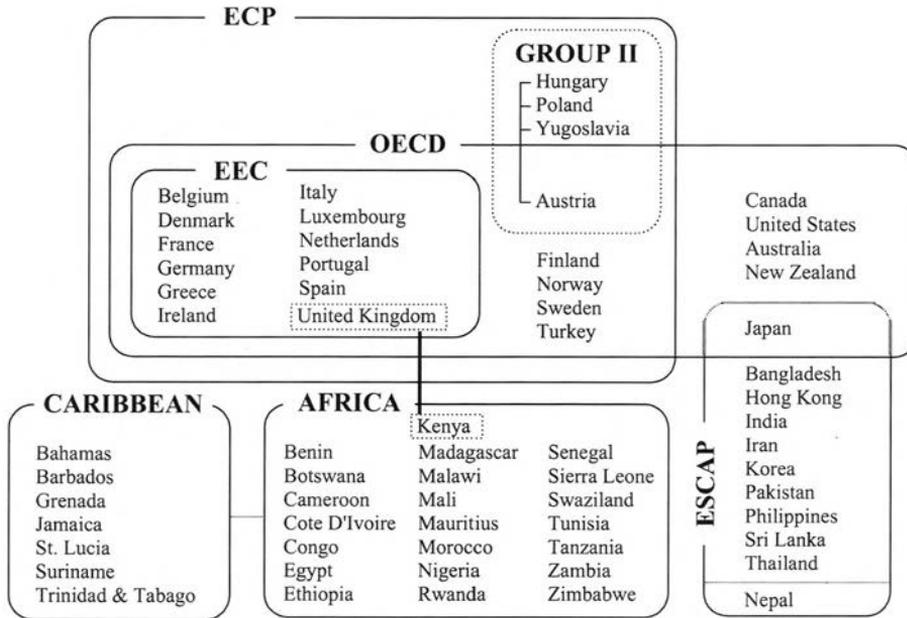

Figure 1 Global Framework of the 1985 ICP

Source: UN (1994).

As was to be expected, the aspect of the new comparisons that attracted most attention in the Australian media was the indicated relationship between Australia's income level and those of the most successful economies to its north. Under the heading 'Aust slides below HK and Singapore', the *Australian Financial Review* noted that 'Australia...lags well behind Singapore and Hong Kong in the World Bank's alternative new purchasing power parity measure of material living standards, which adjusts individual country's per capita [GNP] for their price levels'.[11] This was a correct interpretation of the reported estimates but, as we shall see, it is questionable whether the reported estimates for the relevant countries reflect the reality.

Another aspect of the reported comparisons deserves emphasis. The current official league table shows most of the rich countries as having quite similar levels of average income. Australia, with an indicated average per capita income

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PPP estimates does not rest with national statistical authorities (with the single exception of the Austrian Central Statistical Office), but with the international organisations and other coordinating bodies listed in footnote 8 above.

11 *Australian Financial Review*, 3 January 1995: 5.

in 1993 of int$18,490, was one of ten countries with average incomes of between int$17,500 and int$19,500. And Australia stood in the middle of 20 countries whose average incomes were within a range of +/- 20 per cent of the Australian average. Only the United States and four small and atypical countries were above this range. This concentration of the average income levels of the richer countries in a relatively narrow range suggests that the oft-used league table analogy is inapposite, and the associated concentration of attention on precise rankings is misplaced.

A league table of teams in a sporting competition records unambiguously the precise outcome of a series of contests, according to pre-determined rules. If the purpose of the rankings is to separate the teams which reach the finals from those that failed to do so, it is irrelevant that the margin between the lowest ranked of the former and the highest ranked of the latter may be a fraction of a percentage point on a countback.

For a number of reasons, the rankings in Table 1 have no such significance. First, they have been determined following the application of PPPs rather than actual exchange rate parities, so they do not report the output of a competition (even in the sense of 'competition for markets'). Second, the numbers summarise the outcome of a myriad of transactions and are, therefore, inevitably subject to large errors of measurement. Third, even if the terms of every transaction were known and were included in the calculations, there would be no 'correct' way of aggregating those transactions in order to establish, without ambiguity, the average real income of one country compared with another. Finally, and most importantly, there is no agreement, and there is no prospect of agreement, about the concept of 'income' of which it is always better to have more rather than less.

Depending on the context, our interest might be in the measure of output that is aggregated in the system of national accounts or in alternative measures. For example, our interest might be in measures of output that take account of items not identified in the national accounts; such as unpaid and voluntary work, changes in stocks of natural resources, or in measures which seek to comprehend less tangible aspects of wellbeing or the quality of life. Our interest might be in a measure of income per some unit; such as per hour worked, per capita, per employed person, or some augmented measure of labour,[12] or per unit of some composite of factor inputs. Alternatively, our interest might be in the income of individuals in particular circumstances; for example, the median wage and salary earner, the retired or the unemployed, or the income of particular types of households (such as single income or single parent households).

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12   Such as one that allows for differences in education, skills and/or experience.

Table 1 GNP per capita at purchasing power parities in 1993 international dollars

Rank	Country	Int$
1	Luxembourg	29,510
2	**United States (2)**	**24,750**
3	Switzerland(b)	23,620
4	United Arab Emirates(b)	23,390
5	Qatar(b)	22,910
6	Hong Kong	21,670
7	Japan	21,090
8	Germany(a)	20,980
9	Singapore(b)	20,470
10	Canada	20,410
11	France	19,440
12	Norway	19,130
13	Denmark	18,940
14	Austria	18,800
= 15	**Australia (4)**	**18,490**
= 15	Belgium	18,490
17	Italy	18,070
18	Netherlands, the	18,050
19	**United Kingdom (3)**	**17,750**
20	Sweden	17,560
21	Iceland	17,160
22	Bahamas, the(b)	16,820
23	Cyprus(b)	15,470
24	**New Zealand (1)**	**15,390**
25	Finland	15,230
34	Korea(c)	9,810
35	Argentina	8,630
37	Malaysia	8,630
45	Thailand	6,390
75	Indonesia	3,140
80	Philippines	2,660

Source: See Appendix.

Notes:

(a) Former Federal Republic of Germany.

(b) Obtained from regression estimates.

(c) Republic of Korea

Figures in parentheses are the rankings of relative average income levels from Clark (1938).

Int$ are international prices denominated in 1993 US dollars.

In short, the measurement of income levels at PPPs raises formidable conceptual and practical difficulties which are not properly recognised in bland explanations that 'international prices' have been used to value domestic production, or that the estimates are 'not always directly comparable'. Even if all of these difficulties could be overcome, there would be marked shifts in the rankings of the high-income countries of the 1990s depending on which concept of income or output was seen as most relevant for the purpose at hand.

The dangers of the league table approach to the assessment of economic performance were encapsulated by Stein (1990: A16):

> ...a moment's reflection will show that [our] standard of living, or... personal welfare,...does not depend on our being ahead of anyone else... Our real problem...is not to get richer than someone else or to get richer faster than someone else but to be as good as we can be, and better than we have been, in the areas of our serious deficiencies, such as homelessness, poverty, ignorance and crime.

Stein (1990) was actually speaking of the American experience. However, in the Australian context, similar concerns about league tables have been expressed. The Vernon Committee (1965), in its assessment of Australia's post-war development and prospects for future growth, was reluctant to compare economies and claimed that Australia's performance could not be judged by '... its place in any simple ranking of so called advanced countries...' (para 2.21). More recently, Gruen (1986) has been critical of such rankings, arguing that Australia's slide down the 'totem pole' of per capita income has given rise to somewhat exaggerated concerns about the nation's economic performance. He has maintained that non-economic factors probably 'loom large' in any adequate explanation of why some countries achieve faster growth than others.

It is not the purpose of this paper to deny that summary measures of average per capita incomes, arranged in the form of league tables, may be a useful analytical tool. It will be argued, however, that there is a need for greater circumspection in the use of such comparisons, and for a more informed understanding of their limitations. In particular, it needs to be recognised that aggregates of values cannot meaningfully be compared 'at international prices' if there are large differences in the price *and* quantity relativities applicable to many of the components.

The paper is organised as follows. Section 2 presents estimates of relative real GNP per capita over this century. Sections 3 to 5 deal with a range of conceptual and practical difficulties associated with the identification of these relativities. Alternative approaches are then considered in Sections 6 to 8. They are shown to yield rankings of economic performance that differ significantly from those

in conventional tables. Section 9 then reflects upon the way in which measures of Australia's relative economic performance reflect social choices. Section 10 places these choices in an historical context, and some impressions of earlier relativities are offered. Finally, conclusions are drawn.

2. Indicative estimates of 'real' GNP *per capita*: 1900–1993

The 'official' World Bank (1995) estimates of relative contemporary income levels in Australia and in 16 other countries are exhibited in a long-term context in Figure 2. The 1993 official estimate of Australia's real GNP per capita is backcast to 1900, using IMF estimates of annual growth rates in recent years and those reported by Maddison (1989) for earlier years to construct the time series. (For detailed data description see the Appendix.) Comparable time series for six groups of other countries have been constructed and plotted against the estimates for Australia.

The vertical scale in each panel of Figure 2 is logarithmic, so that equal vertical distances represent equal *proportional* differences in estimated levels of GNP per capita at purchasing power parities (in international prices denominated in 1993 US dollars). According to these estimates, the bunching of the average real incomes of a large number of countries at about the same level is a relatively recent phenomenon: before World War I, the indicated average real income levels in the United States and Australia were around twice those of most countries of continental Europe, which in turn were about twice those of the highest income countries in Asia (the Philippines and Japan).

Figure 2 presents the picture of Australia's relative position over time which has come to be generally accepted. On the one hand, the per capita growth rates of most countries in Europe, and of several countries in East Asia, have been much faster than that for Australia. In fact, the estimates suggest that many of these countries have now achieved an indicated average income level that is at least comparable to, and in several cases is higher than, Australia's. On the other hand, however, the country's per capita growth rate has been substantial in an absolute sense (for example, at a rate sufficient to provide each generation with a standard of living notably superior to its predecessor).
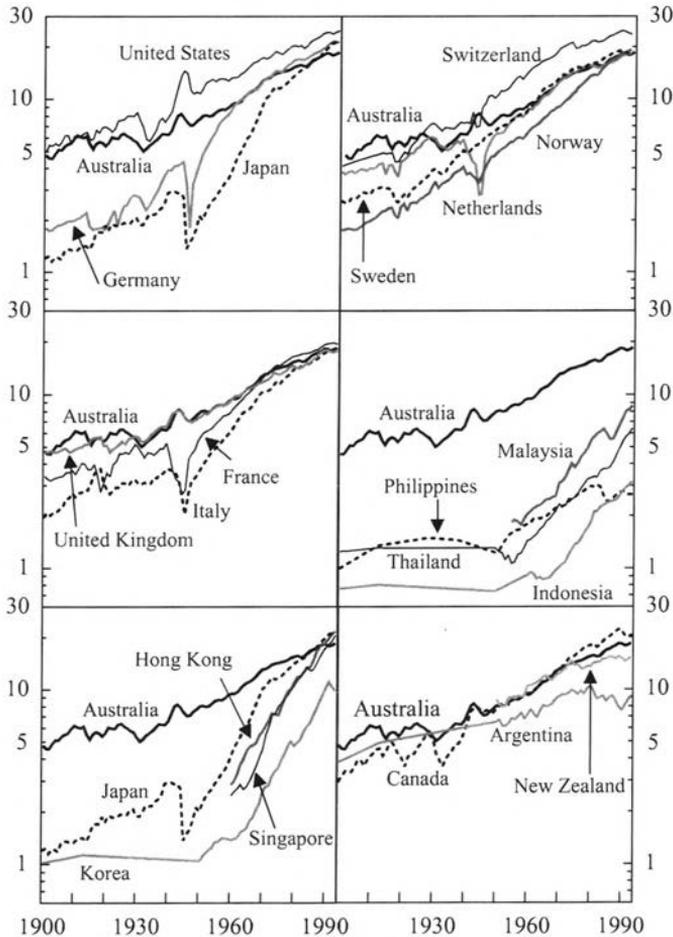
Figure 2 Real GNP per capita in selected economies (see Appendix for data drawn upon)

Source: Author's calculation (see Appendix for data drawn upon).

Much concern has been expressed in Australia in recent times about the decline in the country's relative position on the real income scale.[13] This loss of relativity has arisen because the *growth rate* of Australia's real GDP has been lower than that of most other high-income countries; it does not depend on the reliability or otherwise of the results of PPP studies. Most of the countries whose average real incomes were formerly much lower than Australia's have now 'caught up'.[14]

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13   This debate has been well articulated by Gruen (1986), and more recently by Dowrick and Nguyen (1989) and Dowrick and Quiggin (1993).

14   For a detailed discussion of the phenomenon of catch-up and convergence see Dowrick and Nguyen (1989) and Dowrick in Reserve Bank (1995). *Productivity and Growth*.

However, for the reasons advanced by Stein (1990), and because of fundamental questions about whether meaningful relativities can be established in the first place, this should not of itself be cause for concern.

A final general point is that the focus of attention on the countries at the top of the league table introduces selectivity: the countries on this list are those that have always been near the top, or have had the fastest growth in average real incomes, in the modern era. We are, therefore, comparing ourselves with the countries that have been most successful. Whilst Australia is not among the leaders of this elite, we are clearly ahead of most of the pack.

But what precisely do measures of real income levels indicate about relative economic performance? There are many conceptual and practical difficulties associated with benchmarking these measures to form international comparisons. Backcasting data to form an historical profile of relativities poses even further challenges. The strategy adopted in this paper is to demonstrate the limitations of real income levels as indicators of relative economic performance, and then to provide alternative evidence of relativities, both for the benchmark period and for specific episodes.

3. Methodological problems of the ICP approach

Although indicative estimates of real GNP per capita are expressed in 'international prices denominated in 1993 US dollars' the observations charted in these figures should not be seen as estimates of value, but as *index numbers of relative economic quantities*.[15] The essence of ICP comparisons lies in the *relativities* of average magnitudes between countries and over time, and the expression of those relativities in terms of international prices denominated in US dollars is purely a matter of convenience. The results could be expressed in any other currency: for example, those for the 20 countries participating in the ECP 1985 (see Figure 1) were initially reported in terms of international prices denominated in Austrian schilling.

The real GNP per capita estimates published by the World Bank for 1993 were derived from estimates initially relating to other years in a variety of ways. Those for the countries of the European Union were extrapolated from benchmark EUROSTAT estimates for 1990; those for other OECD countries were also extrapolated from 1990, from an extension of the EUROSTAT study by the OECD;[16] those for other countries participating in the ICP were extrapolated

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15   For a discussion on the concept of economic quantity, see Wilson (1946), especially 6-8.
16   This study relied to a substantial extent on product specifications developed for the purpose of making PPP and real product comparisons between European countries.

from the 1985 reference year of that program; and those for countries not participating in the ICP (including Singapore) were estimated from the results for participating countries by regression analysis.[17]

In brief, the best-performing regression models utilise capital city price surveys conducted as part of a program designed to equalise the real incomes of public servants and business executives assigned to countries around the world. While the price indices designed for this group do not properly reflect the prices or relative quantities of goods consumed by nationals of these countries, a structural relationship was found between the measures of purchasing power derived from these price surveys and those derived from the prices ordinarily used in the ICP. This relationship was then used to form PPP comparisons with non-ICP countries.

The accuracy of these regression estimates, in terms of a 95 per cent confidence interval, is guessed to range from +/- 60 per cent for low-income countries, to +/- 15 per cent for countries with per capita incomes up to seven tenths of that of the United States (Summers and Heston 1991: 341-342). Given the similarity of the PPP-adjusted per capita estimates reported in Table 1, these wide confidence intervals suggest that the reported rankings are of particularly low significance for countries (such as Singapore) that did not participate in the ICP. In addition to this basic qualification about the interpretation of league table rankings, there are several specific difficulties which affect the reliability of ICP comparisons.

Summers and Heston (1991) present the outcome of the ICP in its most extensive form and outline the methodological approach of the ICP benchmark studies in the following terms:

> Basically, an ICP benchmark study is a pricing exercise. Prices of hundreds of identically specified goods and services prevailing in each participating country are collected and processed. The price comparisons that emerge are estimates of price parities for each country's currency at a number of aggregation levels, including an overall purchasing power parity...The price parities and PPPs are used to convert the countries' national currency expenditures to a common currency unit, thus making real quantity comparisons across countries possible.

> The ICP divides up...GDP into about 150 detailed categories (approximately 110 consumption, 35 investment and 5 government). All of a country's individual final output items are assigned to one or another of the categories. The ICP central office works with national

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17   A description and assessment of the methods used to extend PPP comparisons to non-ICP countries is provided by Kravis and Lipsey (1990: 21-26,43-48).

data of two sorts from each participating country: national prices for between 400 and 700 particular items; and national expenditures for each of the 150 detailed categories.

For the prices to provide a meaningful basis for determining relative quantities, *it is of the utmost importance that they refer to the same items*, that is, of the same quantity and quality, *from country to country*. ...To this end, specification manuals giving closely detailed technical descriptions of over 1,500 commodities, services and labour inputs have been developed that cover the universe of all items priced in any country (Summers and Heston 1991: 329, emphasis added).[18]

The emphasised statement may appear to be the obvious expression of an essential requirement of a program that seeks to provide reliable estimates of real quantities. In fact, it conceals a fundamental problem. The practical situation is that the items which are identical in quantity and quality *between* countries are often *not* the items which are most typical or representative of the relevant area of expenditure *within* every country. In the countries in which the items priced are less typical of the purchases made, it would usually be the case that the more typical items provided the buyer with better value for money than the items priced in the ICP. Indeed, it is the 'value for money' consideration that has, in many cases, made a particular product 'typical' of spending. The resulting economies of scale may well make that product progressively cheaper than the more internationally comparable alternatives. The point is best illustrated by some examples.

The list of passenger cars in EUROSTAT's 1985 PPP study, for which the OECD sought prices from its non-EEC members, included 10 diesel engine and 81 petrol-engine vehicles. Of the latter, only five had an engine capacity exceeding two litres. But no cars representative of the bulk of the Australian market (locally produced models with an engine capacity of three litres of more) were included in the OECD comparison. In the outcome, therefore, nominal expenditure on passenger vehicles in Australia was revalued for PPP purposes using a price parity relating to vehicles that were not typical of the Australian market.

For refrigerators, the OECD 1985 list taken over from EUROSTAT's comparison included five single-door models which had an average capacity of 170 litres; and 11 two-door models with an average capacity of 290 litres. At this time the Australian consumer magazine *Choice* reported that 50 per cent of the Australian refrigerator market was held by two-door cyclic-defrost models, and tested 13 such models (nine of which were of Australian or New Zealand manufacture) which had an average capacity exceeding 350 litres.[19] The refrigerator in the typical Australian kitchen was grossly under-represented in the PPP comparison.

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18   See also Kravis, Heston and Summers (1978) for a discussion of these measurement issues.

19   *Choice,* October 1984: 34-39.

The statistical experts at the OECD have recognised this problem and, in cooperation with the statistical agencies of non-EEC member countries, have sought to take some account of it (mainly by being less rigorous about ensuring precise identity of specifications than the Summers and Heston paper suggests is necessary). There are, however, limits to the scale of the *ad hoc* improvements which can be effected in this way when the resources available for the purpose, both at the OECD and in the national statistical offices, are minuscule. There can be little doubt that the PPP estimates for Australia (and also for Canada, New Zealand and the United States) are substantially affected by the fact that the list of items for which prices are sought was initially prepared for the purpose of supporting comparisons between European countries. A program which had recognised the need to take account of North American and Australasian conditions from the outset would probably have identified significantly higher levels of real product, relative to those of European countries, than does the ICP.

4. Conceptual problems in inter-country comparisons

Having regard to these enormous practical and conceptual difficulties, it is perhaps surprising that the ICP results have been accepted by most scholars as reliable and accurate measures of relative levels of real income, and even of living standards or economic welfare, between countries and over time. In contrast, Colin Clark's estimates of the average income in different countries in the late 1930s were greeted with considerable scepticism, largely because of the conceptual constraint known to statisticians as 'the index number problem'. The significance of the index number problem in relation to comparisons of real income was well articulated in 1939 by E (later Sir) Ronald Walker, Professor of Economics at the University of Tasmania. In an essay published soon after Clark's Joseph Fisher Lecture, Walker suggested that, for scientific purposes, the term 'standard of living' should be abandoned; and he considered that a concept such as the average real income:

> …can be calculated, and has meaning, only if we accept certain conventions, which rest on assumptions regarding similarity of culture. But…the comparisons in which we would be most concerned are comparisons between countries…in which these conventions cannot be accepted. Our conclusions, therefore, are somewhat negative. Not only are most international comparisons of living standards misguided in intention, but those to which approval can be accorded are practically impossible; except between nations which resemble each other so closely as to rob the comparisons of much of their interest. The most useful work in this field, from the scientific viewpoint, will be found

not in the reduction of highly doubtful differences in living standards to spuriously precise indexes, but in the comparative study of the actual content of typical family budgets of different classes in the relevant countries.[20]

In raising these doubts about the possibility of making quantitative comparisons of real income levels between countries with widely differing cultures, Walker was repeating concerns that had been voiced for decades by statisticians and economists. Perhaps their most famous expression was by Keynes (1909) in an essay entitled 'The Method of Index Numbers with Special Reference to the Measurement of General Exchange Value', for which he won the Adam Smith prize for that year.

Keynes criticised official British estimates of relative levels of real wages in different districts of the United Kingdom. He reproduced from the official report a statistical table which purported to show that real wages in London were three per cent higher than in Ireland, and then rearranged the same information in a way which appeared to show that real wages in London were two per cent *lower* than in Ireland (see Great Britain (1908)). He claimed that both results were arbitrary:

> The arbitrary element enters in when we decide what standard quantity of food corresponds to a given standard quantity of house-room. …If the standard is fixed for all districts with reference to what is actually the standard in London, we get one result; and if we fix it with reference to what is actually the standard in the Midlands or in Ireland, we get a different result. Which of these standards we choose is, from all points of view, wholly arbitrary (Keynes 1910: 180).

In his more detailed exposition, Keynes distinguished between two kinds of difficulty which arose in the use of index numbers to measure economic quantities:

> In the first kind, the quantities in question are perfectly definite and capable of measurement, but the information at our disposal is incomplete. Our task consists in making as accurate a measurement as we can by using what statistics we have. In the second kind the quantity itself is not, in the strictest sense, capable of numerical measurement at all. We must adopt some conventional, but practically useful, measure and our task mainly consists in elucidating the quantitative aspect of the concept in question…

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20   See Walker (1939: 61,64). Following a distinguished diplomatic career, Sir Ronald Walker was to be appointed Australia's first Ambassador to the OECD in 1971. In 1930, when he had been a PhD student at Cambridge, Walker 'had been invited…to become a member of the famous Political Economy Club…which met every Monday evening during term in Keynes's rooms in King's College… . When Walker was in Cambridge… Colin Clark regularly attended meetings' (Cornish 1991: 60).

> We have in 'the cost of living' a conception which is *prima facie* measurable. We should say that the comparison of the cost of living in two different places requires no more than the collection of the necessary statistics. Reflection shows, however, that this is not the case. The difficulty in comparing the cost of living of two sets of people who live under very different conditions is not a statistical one. It depends upon the intrinsic difficulty of saying what scale of living under one set of circumstances corresponds to a given scale of living under a different set. The two things may be numerically incommensurable (Keynes 1909: 53, 62-63).

The difficulty to which Keynes was alluding must be distinguished from a different issue with which it is commonly confused: that of the difficulty (or impossibility) of making inter-personal comparisons of utility. As Keynes was to argue in his final exploration of the problems of comparisons of purchasing power, more than 20 years later:

> …we do *not* mean by purchasing power the command of money over quantities of utility. If two men both spend their incomes on bread and both pay the same price for it, the purchasing power of money is not greater to the one than to the other merely because the former is hungrier or poorer than the latter. The purchasing power of money is not different to two individuals with equal incomes because one has greater powers of enjoyment than the other. A redistribution of money incomes which has the effect of increasing the aggregate of utility does not in itself affect the purchasing power of money (Keynes 1930: 96).

Thus the particular problem which limited the possibility of comparing average purchasing power was that:

> …the composite commodities representative of the actual expenditure of money-incomes are not stable in that constitution as between different places, times or groups. They are unstable for three reasons — either (1) beacause the need which the object of expenditure is intended to satisfy… varies, or (2) because the efficiency of the objects of expenditure to attain its purpose varies, or (3) because there is a change in what distribution of income between different objects is the most economical means of attaining the purpose. The first of those reasons we may classify as a change in tastes, the second as a change in environment, and the third as a change in relative prices. For these reasons every change in the distribution of real incomes or in habits and education, every change in climate and national customs, and every change in relative prices and in the character and qualities of the goods offering for purpose, will affect in some degree the character of average expenditure (Keynes 1930: 95-96).

Keynes went on to examine a number of possible methods of arriving at approximations of the relative purchasing power of incomes, distinguishing between the direct method of comparing incomes of similar persons and various indirect methods of comparing prices of equivalent composite commodities. But there were limits to all of these methods, which Keynes explained in typically piquant illustrations:

> We are not in a position to weigh the satisfactions for similar persons of Pharaoh's slaves against Fifth Avenue's motor cars, or dear fuel and cheap ice to Laplanders against cheap fuel and dear ice to Hottentots... We cannot hope to find a ratio of equivalent substitution for gladiators against cinemas, or for the conveniences of being able to buy motor cars against the conveniences of being able to buy slaves (Keynes 1930: 104–109).

It is arguable that the differences between the objects of consumption which were available to the many in 1930, and to the few in classical times, were not greater than those which are available to the many in 1995, compared with those available to the few in 1930. The problems of comparing purchasing power 'as between different places, times or groups' in the late 20th century are even greater than those that troubled Keynes, but a world which constantly demands the quantification of the unquantifiable appears to be unable to come to terms with the notion that 'two things may be numerically incommensurable'.

Keynes' doubts about PPP comparisons between groups with widely differing expenditure patterns were not the cautions of an insecure statistician, fearful of sacrificing detail by striking an average, but the strongly stated verdict of one of the greatest economists after decades of serious reflection. It is remarkable that they have been so quickly set aside, in the uncritical acceptance in recent times of league table comparisons of economies between which there are massive differences in 'the character of average expenditure'.

5. The 'index number problem' in practice

An example of this uncritical acceptance has already been given: the reporting of the *World Bank Atlas*, PPP-adjusted estimates of real per capita incomes in Australia compared with Hong Kong and Singapore. Such comparisons ignore the serious logical problems identified in the preceding section. In order to demonstrate this, the relationship between the ICP 1985 price and quantity relativities for the main components of final national consumption of Australia and Hong Kong will be examined in some detail.[21]

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21 It is not possible to compare these relativities for components of the final national consumption expenditure of Singapore, the other country whose rise in the *World Bank Atlas* rankings was prominently

These relationships are plotted in Figure 3 for each of 20 broad commodity groups. Each of the observations is itself an aggregation of the price and quantity relativities of each commodity within the group and, as such, has its own index number problems. Of the 20 broad commodity groups, there are only four for which the relative per capita quantity consumed in Hong Kong lies between two-thirds and one and a half times that in Australia. And of the 16 commodity groups for which the quantity relative lies outside this wide range, there are six for which the bilateral price relative *also* lies outside that broad range.
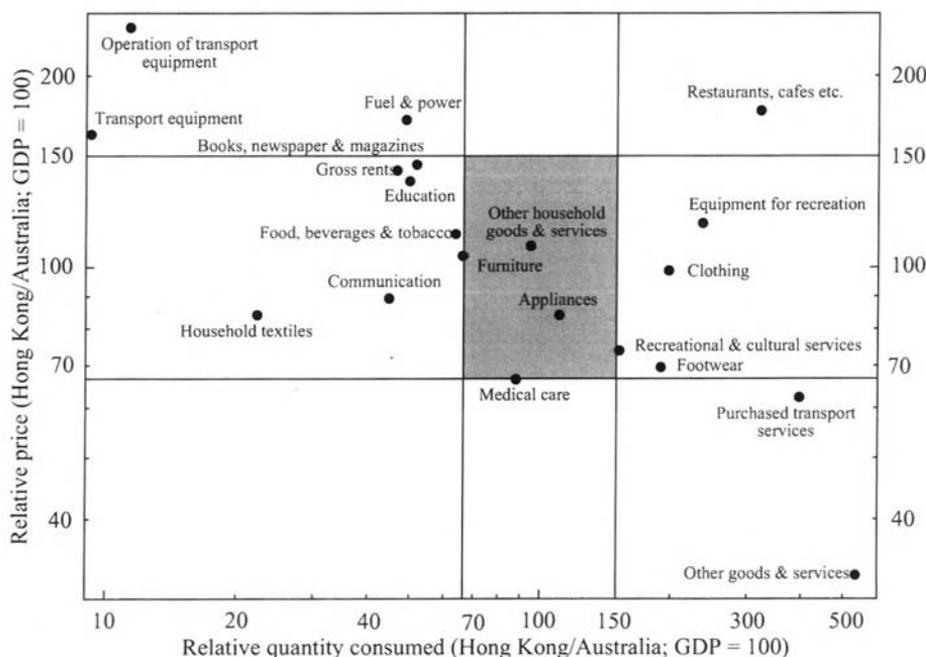

Figure 3 Relative prices and relative quantities consumed in Australia and Hong Kong in 1985.

Source: See Appendix.

Suppose that the relative *prices* of all commodities in the two countries had been the same, so that, for example, the average price of a given quantity of medical care bore the same relationship to the average price of a given quantity of clothing in each. In that case, each of the observations in Figure 3 would lie along a horizontal line at 100, and the relative GDPs of the two countries could be calculated without ambiguity (assuming there were no measurement problems) by valuing the various different commodities, produced in differing proportions between the two countries, at that constant relative-price relationship.

reported in the Australian media. Singapore has not participated in the ICP, but other information, discussed in Section 8 below, suggests that the index number problem which is illustrated here in respect of the Hong Kong/Australia comparison, would apply with equal or greater force in the case of a Singapore/Australia comparison.

Alternatively, suppose that the relative *quantities* of all commodities consumed in the two economies were the same. In that case, each observation would lie along a vertical line at 100, and an unambiguous computation of the relative price levels of the two countries could be achieved by weighting all of the various price relativities of each individual commodity between the countries by the amount of each commodity consumed.

In fact, however, the ICP results plotted in Figure 3 show that the price *and* quantity relativities of commodity groups differ greatly between Australia and Hong Kong.

In short, the conditions identified by Keynes under which an *approximate* comparison of real quantities could be made are not fulfilled. It is important to recognise that the problem of comparing the PPP and real product relationships between two countries as different as are Australia and Hong Kong would still be there, even if we had perfect knowledge of the quantity and price of every transaction in both countries in the reference period. As Keynes pointed out, the problem with which we are confronted is not a statistical one, but one that arises from 'the intrinsic difficulty of saying what scale of living under one set of circumstances corresponds to a given scale of living under a different set'.

When the World Bank authors made the seemingly simple statement that the PPP-adjusted real income estimates take into consideration the purchasing power differences of the currencies in which the national estimates were originally compiled, they are implicitly asserting that (to use Keynes' words), 'the comparison of the cost of living in two different places requires no more than the collection of the necessary statistics'. But PPP-adjusted measures cannot provide satisfactory measures of the relative real product or the relative price levels in Australia and Hong Kong, because the problem of aggregation is intrinsic. It cannot be overcome (but is, unfortunately, obscured) by multilateral comparisons in which expenditures are revalued in 'international prices' rather than in the prices of one or both of the countries which are the subject of comparison.

As it happens, the ICP revaluation of 1985 nominal expenditures in terms of international prices showed similar levels of per capita final national consumption in Australia (int$7,946) and Hong Kong (int$7,710). On average, per capita expenditure on the purchase and operation of transport equipment in Australia was over ten times greater than in Hong Kong, and per capita expenditure on the purchase of transport services (fares) was over three times greater in Hong Kong than in Australia. As Figure 3 shows, there were also large differences in the opposite direction in the price relativities for these groups.

A necessary implication of the existence of such large differences in price and quantity relativities is that the aggregation of the expenditures at international

prices is an artificial exercise. The transactions did not take place at international prices and, if international prices *had* prevailed in each of the markets, the quantities of the various commodities consumed would have been entirely different. In the outcome the relative real income for each country depends to an important extent upon the degree to which the price and quantity relativities for that country differs from the corresponding average relativities for the entire group of participating countries.

The extent to which ICP comparisons can be affected by the aggregation of expenditures at hypothetical rather than actual prices may be judged by a specific example from the 1985 benchmark study. According to the estimates published by the OECD (OECD 1987), the *nominal value* per head of final expenditure on gross rent in Portugal, *at national prices* converted to US dollars at the prevailing exchange rate, was US$85 (OECD Table 16). The so-called *real value* per head of the same component *at average EEC prices* was estimated at US$677 (OECD Table 6). The *real value* per head when measured *at average OECD prices* was US$855 (derived from OECD Tables 7 and 8). And the so-called *real value* per head of final expenditure *at international prices* was US$1,100 (UN 1994, Table 3).

Thus the expenditure on gross rent in Portugal in 1985 was estimated to be 13 times greater when measured at international prices than when measured at the actual values recorded by Portugal's national accountants. Other components of final expenditure in Portugal (the purchase of transport equipment, for example) were estimated to be a *smaller* total in international prices than at the prices which were actually paid.

In Table 2, the so-called real value of expenditure on gross rents in Portugal (US$1,100) is placed in a different context. The table shows the estimated '*per capita* real value of final expenditure' of 'gross rents' in OECD countries in 1985. All of the information is reproduced from a table in the official report on Phase V of the ICP (UN 1994, Table 3), with the ranking presented in the form of a league table.

It is obvious from casual inspection that the comparisons in Table 2 do not indicate the relative standards of housing in the OECD countries in 1985. No study of housing conditions at that time could have concluded that Spaniards were better housed on average than Americans; or that Japanese were better housed on average than Australians; or that Portuguese were better housed on average than New Zealanders. Such comparisons are immediately recognisable as wrong by anyone familiar with the housing conditions prevailing in these countries, or with the available statistical information bearing directly on the subject. Yet the real expenditures on gross rent are a significant component of the ICP estimates of real GDP which have attracted such widespread and uncritical attention.

Table 2 Per capita real value of final expenditure on gross rents at international prices in 1985 US dollars

Rank	Country	Int$
1	Spain	1,851
2	Japan	1,789
3	Denmark	1,787
4	United States	1,710
5	Sweden	1,681
6	United Kingdom	1,657
7	Italy	1,582
8	Australia	1,579
9	Canada	1,511
10	France	1,326
11	Finland	1,254
12	Luxembourg	1,233
13	Belgium	1,183
14	Austria	1,138
15	Netherlands, the	1,129
16	Germany	1,124
17	Portugal	1,100
18	New Zealand	1,067
19	Norway	890
20	Ireland	727
21	Greece	539
22	Turkey	161

Source: See Appendix.

6. An alternative approach

The fact that measures of relative real product or relative price levels cannot be satisfactorily measured tends to support the view expressed by Walker that the only international comparisons of living standards to which approval can be given are 'practically impossible'. Walker did, however, suggest an alternative approach which he believed could provide more useful results: 'the comparative study of the actual content of typical family budgets of different classes in the relevant countries' (Walker 1939: 64).

Figure 4 provides an illustration of the approach that Walker advocated. The comparison is again between Australia and Hong Kong, with three pie charts for each country showing the patterns of household expenditure (other than

on housing) of low, middle and high-income groups in the late 1980s.[22] For the low-income group – representing the 50 per cent of households with the lowest incomes – the relevant charts show that the 'all other' category absorbed 65 per cent of the non-housing expenditure of Australian households, compared with only 38 per cent for the corresponding households in Hong Kong. The *ratio* of the largely discretionary 'all other' component to expenditure on food rises in Hong Kong from 74 per cent at the lower income level to about 130 per cent for the high-income group; in Australia, the corresponding ratio rises from 260 per cent at lower incomes to over 360 per cent at the high income level.[23]
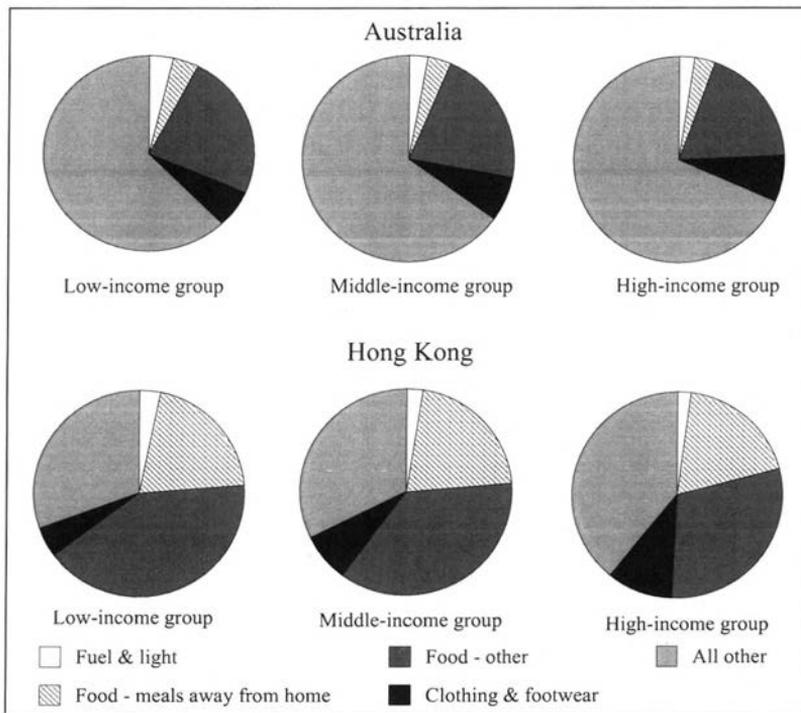

Figure 4 Expenditure shares excluding housing in Australia and Hong Kong.

Source: See Appendix.

There is thus a striking contrast between the picture shown by a bilateral comparison of the patterns of household spending of different income groups in the two countries, and that shown by a comparison of their real income levels

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22   For details of sources see the Appendix.
23   As would be expected, the ratio of 'all other' expenditure to expenditure on food also rises over time for any given income group. In the case of Hong Kong, this ratio increased from 66.6 per cent in 1979/80 (Hong Kong Census and Statistics Department (1981, Appendix 7)) to 74 per cent in 1989/90.

at so-called international prices. In the one case, the differences are extremely large; in the other, they are negligible. The contrast does not mean that the ICP comparison is 'wrong', in that the result could be corrected by the substitution of additional or more precise estimates of particular expenditures or prices. It is rather that the ICP type of comparison is *impossible* for the reasons carefully stated by Keynes.

The central point is really quite a simple one. The 'real' value of a money income can only be measured in terms of the goods and services which could be purchased in the markets where that income is actually spent, and cannot be affected by the structure of prices in other markets.

Although the comparative analysis of household expenditure at different income levels does not, of itself, indicate 'real' levels of income or the PPPs of different currencies, it may provide useful guidance on these matters. For example, the analysis exhibited in Figure 4 shows that the proportion of household expenditure devoted to 'fuel and light' was somewhat higher in Hong Kong than in Australia in all three of the income groups which are identified. Other sources reveal that the per capita residential use of electric power (which represents a high proportion of this expenditure component in both countries) is well over twice as great in Australia as in Hong Kong (OECD/IEA 1994a, 1994b). Taken together, these indicators reveal that the unit cost of power for domestic use is, relative to average incomes, much lower in Australia; and that the per capita quantity of power consumed was far higher in Australia.

7. 'Comparison-resistant' items

Of course, analyses of household expenditures cannot indicate relative real levels of spending in those areas of final demand for which the real level of consumption of individual households is not closely related to their expenditures. Important examples are the imputed rent of owner-occupied dwellings and publicly provided or subsidised education and health services.[24] These are, however, precisely the areas in which the ICP approach to inter-country comparisons of real income also encounters its most serious difficulties.

The difficulties in estimating real levels of expenditure on gross rents have already been discussed. In this case, it can be argued that the process of revaluation of the nominal expenditures recorded in the national accounts at international prices is circular and unnecessary. As the individual national estimates for imputed rents have been built up from information about the

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24   These are not minor issues. In Australia in 1990, imputed rent was estimated to be 12.8 per cent of household disposable income, while government expenditure on health and education was 11.5 per cent.

physical stock of dwellings derived from censuses and housing surveys, the most reliable way of estimating relative real expenditures would be to utilise that information, and to use the national estimates of nominal values only for weighting purposes. In fact, the ICP attempts to make estimates of rentals for 'finely specified housing units', such as a country's rent for an apartment in a 20-year old multi-storeyed building, of 120 square metres, with central heating and one bathroom (Summers and Heston 1991: 330).

Summers and Heston recognise that an implication of this approach is that location effects on rentals are ignored, but that it is unclear how, even in principle, such an important effect should be treated. The scale of the potential errors that may result from the ICP treatment is illustrated in Figure 5, which compares the per capita 'real' expenditure on gross rents in selected OECD countries in 1990, as estimated in the OECD benchmark PPP study (OECD 1992). It is obvious that the relativities shown in the figure, like those shown for the 1985 benchmark in Table 2, are seriously awry, presumably because the rental deflators used to revalue nominal expenditures differ from the (mainly imputed) rental values which were used by the national accountants to estimate nominal expenditures in the first place.
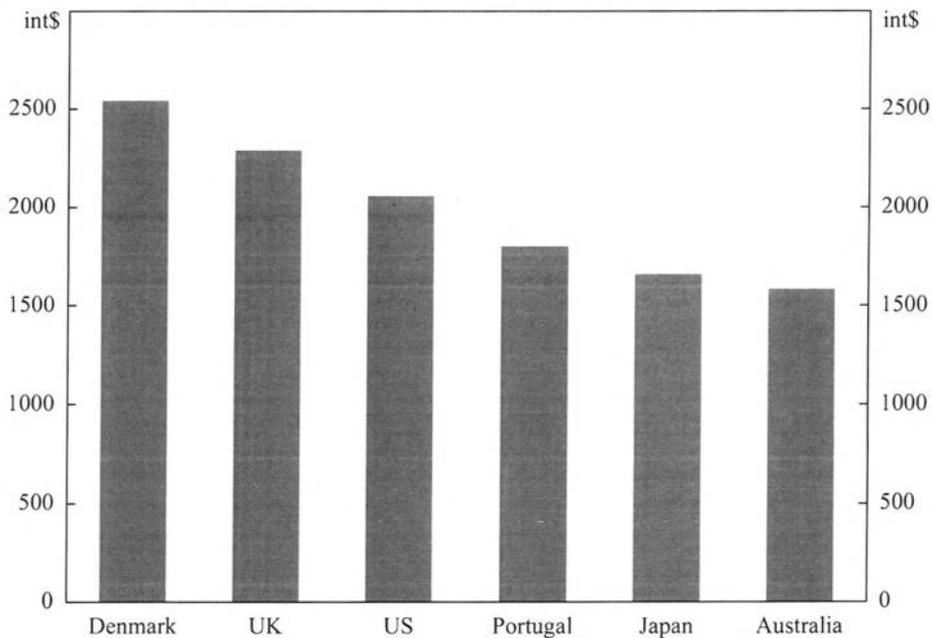

Figure 5 Gross rent in selected OECD countries

Source: See Appendix.

For example, in a bilateral PPP comparison between Australia and the United Kingdom for 1958, it was estimated that real expenditure on housing was 21 per cent higher in Australia than in the United Kingdom, whether measured in British or Australian relative prices (Haig 1968: 45). The implication of the OECD estimates that per capita expenditure on dwellings, on a PPP-adjusted basis, was 30 per cent *lower* in Australia in 1990 is implausible, particularly in the light of the commonly held view that investment in housing in Australia has made a disproportionately heavy call on domestic savings in recent decades.

According to the OECD estimates, per capita 'real' expenditure on dwelling rents was also higher in Japan than in Australia in 1990. This finding is at odds with general opinion in both countries, and with a mass of statistical evidence. In 1939 Colin Clark recorded, on the basis of 'the results of a recent survey', that the average floor area of houses in Queensland at that time was 1,275 square feet (118.5 square metres);[25] and the average floor area of new dwellings completed in Australia increased from 160 square metres in 1983 to 185 square metres in 1993.[26] By comparison, the average floor area of houses in Japan in 1988 was 89 square metres.[27] These figures suggest that the PPP-adjusted estimates of real expenditures on gross rents in Australia would have been far higher had they correctly captured the physical characteristics of the housing services to which the ICP comparisons must necessarily be restricted.[28]

The ICP principals also acknowledge the '...particularly thorny problem of somehow valuing services that are not priced in the market...' in areas such as general government, medical care and education (Summers and Heston 1991: 330). The solution that has been adopted, as in the national accounts, is to derive price parities for these categories on the basis of input comparisons. As in the dwellings case, however, this approach could be implemented more reliably by the direct use of available data on real inputs (e.g. numbers and utilisation of hospital beds, numbers of health professionals and para-professionals), rather than by attempting to deflate relevant components of expenditure by average bed-day costs or the average income of nurses.

An indication of the possible effect of the ICP procedure of revaluing nominal expenditures with measures of input prices, even in 'comparison-resistant' areas such as health care, is provided in Figure 6. These figures compare World Health Organisation (WHO) data on the numbers of physicians and nurses in relation to population in selected countries in the late 1980s with the 1985 ICP estimates of 'real' per capita final national consumption expenditure on health care in

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25   From the Colin Clark papers, Fryer Library, University of Queensland.
26   As reported in the Australian Bureau of Statistics' *Australian Social Trends 1994* (ABS Cat. No. 4102.0: 156).
27   *Japan Statistical Year Book 1993-94*: 596. For a comparison of the size and equipment of housing between Sydney and Japanese cities, see Castles (1992: 92-121) also published as chapter 21 in this book.
28   However, it is not relevant to an evaluation of the reliability of the ICP data that physical characteristics may be an inadequate measure of the quantum of housing services consumed.

the same countries. The latter estimates imply that per capita expenditures on health care, when measured in international prices, are over two and a half times greater in Japan than in Canada, and nearly twice as great in France as in Australia or New Zealand. Even in the absence of other information, these wide margins of difference would have appeared implausible; and the WHO data on the numbers of health professionals suggest that any differences may, in fact, be in the opposite direction to that indicated by the ICP estimates.
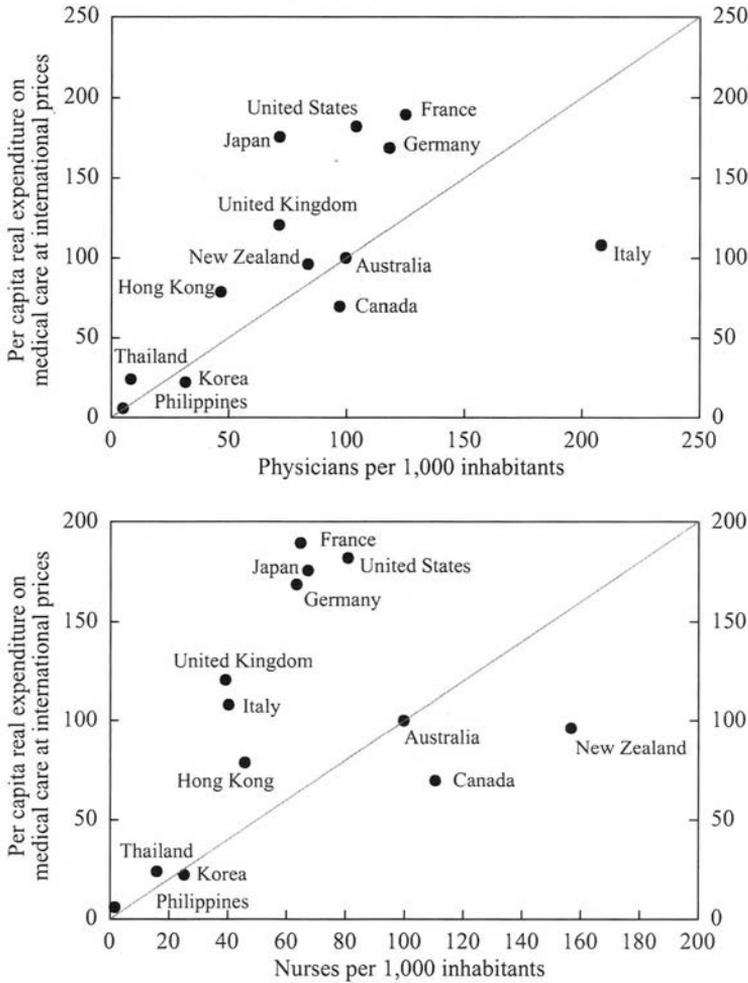

Figure 6 Real expenditure on medical care in 1985 v. numbers of physicians and nurses (Australia = 100)

Source: See Appendix.

8. The evidence from non-official surveys

In the two preceding sections, it has been shown that the estimate of Australia's relative real per capita product emerging from official PPP studies appears to be improbably low when compared with indications from other sources of information – from household expenditure patterns in relation to comparisons with Hong Kong, and from various quantity measures in relation to comparisons with a number of countries for components of expenditure which have been identified as 'comparison resistant'.

In this section, the ICP results are tested against those of three non-official studies – the celebrated 'Big Mac' index published annually by *The Economist* since 1986; the surveys of prices and wages around the globe that have been published by the Union Bank of Switzerland (UBS) at approximately three-year intervals since 1970; and a recent study of relative living standards using the revealed-preference principle, by Dowrick and Quiggin (1993).[29]

The Economist has explained that the Big Mac index was devised 'as a light-hearted guide to whether currencies are at a "correct" level.'[30] But its promotion as a measure of value has not been entirely in jest. The worldwide survey of the price of a standard hamburger at McDonald's is, in a sense, at the opposite extreme to the ICP. Instead of pricing hundreds of commodities, services and labour inputs which 'cover the universe of all items priced in any country' and then weighting the resulting price relativities with the aid of detailed dissections of expenditure, the price of a single commodity is taken as representative of all final prices (though many significant intermediate prices have entered into that final price, including those of several foodstuffs, packaging, various categories of labour services, fuel and power, commercial rents and so on).

Although presented as a price parity, the Big Mac index can be used to denominate real product. In fact, it is instructive to think of a league table based on alternative units of measurement. In Table 3, each country's average per capita income is expressed as an index in relation to Australia's: first on a conventional PPP basis; and second in terms of Big Macs.[31]

In nearly all cases, Australia's 1993 GDP was relatively higher (and in some cases very substantially higher) when expressed in Big Macs rather than in international dollars according to the World Bank's PPP measure. Hong Kong was, however, a significant exception: its per capita GDP was, when expressed in Big Macs, far higher than that of any other country shown in Table 3.

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29   They used a revealed preference approach whereby observed consumption was assumed to be the preferred element in a given budget set.

30   *The Economist*, 15 April 1995: 78.

31   Using the April 1993 prices reported in *The Economist*, 17 April 1993: 83.

Also shown in Table 3 are the results of a similar computation from the most recent Union Bank of Switzerland survey (UBS1994). The 1993 nominal per capita GDP of each country has been divided by the nominal total cost, in the June quarter of 1994, of the basket of 111 goods and services, weighted by European consumer habits, which are included in the UBS survey. The resulting per capita GDPs, expressed in UBS basket units, have then been calculated as indices (Australia = 100). A similar procedure has been followed to calculate component indices for other groups of items in the UBS survey. These are charted in Figure 7.
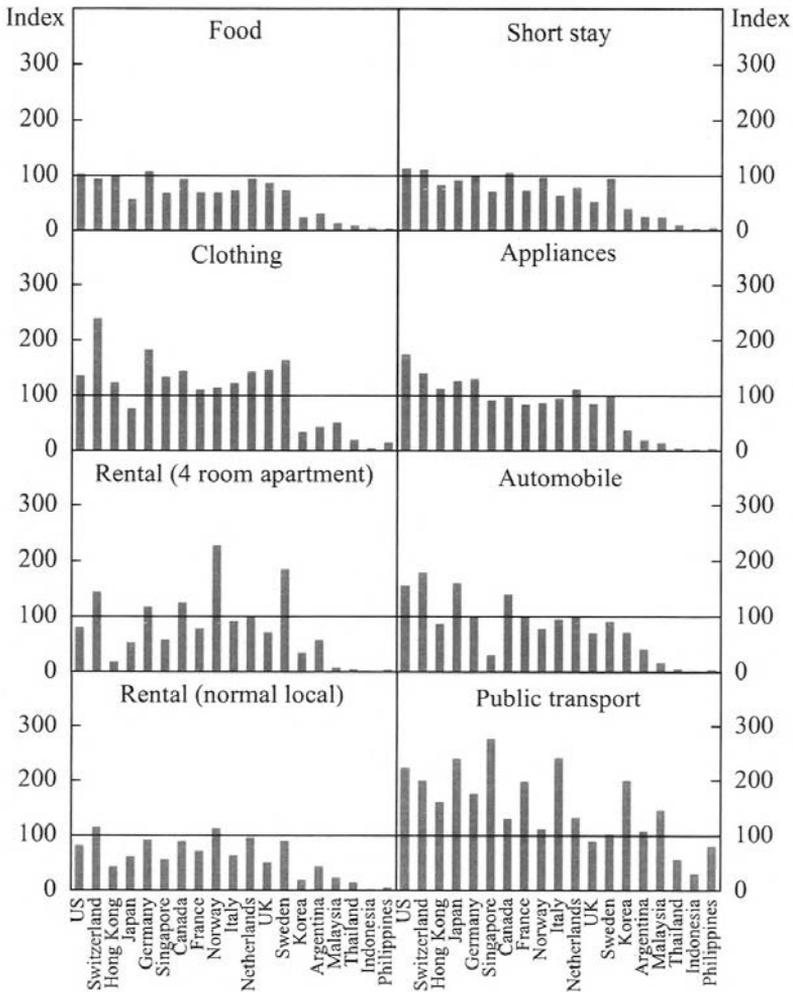

Figure 7 GDP per capita expressed as an index of selected baskets of goods and services (Australia = 100)

Source: See Appendix.

By comparison with the ICP, on which the official league table of real incomes is based, the 1994 UBS study was of modest dimensions, but it was not minuscule. More than 20,000 data items were collected by the UBS's correspondent banks and by its foreign branches and representative offices in 53 cities. In most cities the information was collected by two units working independently of one another. The entire body of data was then analysed by the Economic Research Department at the Bank's Head office in Zurich, thus ensuring a degree of central coordination which could not be matched by the ICP (which has responsibilities for various aspects of coordination located in New York, Washington, Paris, Philadelphia, Luxembourg, Geneva, Vienna and Bangkok). The results of this substantial survey, as reported in Table 3 and Figure 7, support two significant generalisations.

First, they confirm the indications from other evidence that Australia's relative real per capita income is understated in the official PPP estimates. Compared with *most* of the countries shown in the figure, the indicated level of per capita GDP is higher (and in several cases substantially higher) when measured in UBS basket units than when measured in international dollars at the PPPs revealed by the ICP. The significance of this conclusion is strengthened by the fact that the UBS basket is based specifically on European consumer habits, and would therefore be expected to be cheaper in European cities than a basket which took greater account of American, Asian or Australasian expenditure patterns for the purpose of comparisons with cities on those continents.[32]

Second, the purchasing power of per capita incomes in the various countries differs markedly between individual expenditure groups. These results, therefore, serve to reinforce the reservations that have been made in previous sections about the possibility of measuring, on a single scale, the average real incomes of communities living under very different conditions.

Given that communities do live under different conditions, one approach is to account for the revealed preference implicit in the choices. The results of the study using the revealed-preference principle are best reported in the words of one of the authors:

> ...we demonstrate that once proper account is taken of purchasing power, and also of leisure, the average standard of living in Australia is probably higher than in Japan. We base this assessment on detailed OECD data supplied by the Australian Bureau of Statistics...which gives a breakdown of 1990 GDP by prices and quantities for forty categories of goods and services.
>
> Our judgment that Australians are, on average, better off is based on the revealed preference principle. A resident of Australia who is earning average Australian hourly wages *could* have afforded to buy the Japanese

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32   New Zealand was not represented in the UBS survey.

bundle of goods and services if she had worked Japanese hours. The fact that she *actually* chose the Australian bundle is taken as evidence of a higher standard of living, particularly since the average resident of Japan could not have afforded the Australian bundle of goods, services and leisure. ...On this basis we make the judgment that Australia's average living standards rank somewhere in between tenth and twelfth in the OECD,… ahead of Japan (Dowrick 1993: 3).[33]

In other words, differences in the relative structure of prices between countries can nullify conclusions based on measures of GDP 'at international prices'.

Table 3 Alternative league tables

World Bank 1993			Big Macs 1993			UBS 1994		
Rank	Country	Index	Rank	Country	Index	Rank	Country	Index
1	United States	133.9	1	Hong Kong	161.0	1	Switzerland	131.2
2	Switzerland	127.7	2	United States	112.2	2	FRG	121.2
3	Hong Kong	117.2	3	Singapore	108.8	3	US	116.9
4	Japan	114.1	4	**Australia**	100.0	4	Canada	111.2
5	FRG	113.5	5	Japan	99.8	5	Austria	108.9
6	Singapore	110.7	6	FRG	99.4	6	Denmark	107.6
7	Canada	110.4	7	Canada	93.6	7	Belgium	106.5
8	France	105.1	8	Switzerland	90.7	8	Netherlands	104.7
9	Denmark	102.4	9	Austria	81.5	9	**Australia**	100.0
10	Austria	101.7	10	Netherlands	72.0	10	Sweden	93.5
= 11	**Australia**	100.0	11	Belgium	69.5	11	Japan	91.4
= 11	Belgium	100.0	11	Belgium	69.5	11	Japan	91.4
13	Italy	97.7	13	Denmark	68.3	13	Italy	89.2
14	Netherlands	97.6	14	Sweden	67.6	14	UK	82.8
15	UK	96.0	15	Italy	63.4	15	Singapore	78.0
16	Sweden	95.0	16	UK	63.1	16	Hong Kong	75.5
17	Korea	53.1	17	Malaysia	26.9	17	Argentina	35.8
18	Argentina	49.4	18	Korea	26.2	18	Korea	34.7
19	Malaysia	46.7	19	Argentina	22.0	19	Malaysia	19.0
20	Thailand	34.6	20	Thailand	10.4	20	Thailand	10.3
21	Indonesia	17.0	21	Indonesia	4.5	21	Indonesia	4.2

Note: Rankings refer to this subset of countries only.

Source: See Appendix.

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33   As Dowrick (1993) acknowledges, an alternative explanation of observed differences in consumption and leisure is simply that Australians and Japanese might have fundamentally different tastes. However, he finds that variations in OECD consumption patterns are explicable as responses to the different price structures in each country.

9. Australia as a 'different' society

The impression of Australia as a 'different' society is found not only in studies of the revealed preferences of Australians, but in the impressions of visitors and temporary residents over the years. As one external commentator observed in 1985:

> Australia is not a carbon copy of other modern democracies, even of those with whom it has close and continuing relations and is commonly compared. ...Australia is different today; it was different in the 19th century. It was prosperous, very prosperous, when many nations now wealthy were not so at all. Australia retains some residual memory of its earlier great affluence – an affluence based on speculation, built on hazard and greed. While international statistical comparisons suggest that the very rich are now to be found elsewhere in the world, Australians are concerned...with what some see as a growing cupidity and materialism at home. A more fundamental concern, certainly, is whether Australia will continue to do well in the fiercely competitive economic world of the future, whether so easygoing a society will be able to accommodate itself to the demands of a new kind of industrial order...(Graubard 1985: v, viii).

There is evidence that, from the earliest days of the nation's great era of relative affluence, the Australian 'bundle of goods, services and leisure' was weighted more towards leisure than the bundles of other countries. In January 1857, Stanley Jevons, later to become one of the great economists, attended 'a very grand cricket match between Sydney and Melbourne...; it was in the Domain which from its natural beauty and splendid position and the immense number of orderly people in it presented one of the most beautiful spectacles I ever saw'. Writing to his brother in England, the 21-year-old Jevons went on to describe the huge attendances at the match, calculating that 'nearly one quarter of the population was at the match at one time and the business of the town was quite interrupted'. And then he concluded:

> I take this to be a sign, not of laziness, but that the people are so well today as to be able to spare more holidays and really to enjoy themselves more than the people of other countries (Jevons 1856).[34]

A similar conclusion was expressed more than a century later by the OECD (1972) in its first annual review of the Australian economy:

> No one can doubt that there are differences in social attitudes among countries...in the relative value placed on work and leisure, on money-making, on duty and discipline – *which cannot help but affect the rate of*

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34 Jevons' observation is confirmed by the historian G Blaney: 'Sydney and Melbourne led the world in having Saturday afternoons off for working men and that meant they were free to attend sporting events' (*The Weekend Australian,* 17-18 June 1995: 26).

economic growth. Australians, though no more consistent in their demands on life than other people, have for long leaned towards the view...that economic growth is not everything (OECD 1972: 28, emphasis added).

Jevons and the OECD reviewers clearly approved of the priority which Australians accorded to leisure and to the pursuit of 'non-economic' goals. But there has been another strand in the Australian national culture with which economists have been less comfortable, the manifestations of which may provide the key to the relatively slow apparent growth in real incomes during the 20th century which is exhibited in Figure 2. It was identified by WK (later Sir Keith) Hancock in his remarkable book *Australia*, published in 1930:

> The Australians have always disliked scientific economics and (still more) scientific economists. They are fond of ideals and impatient of technique. Their sentiments quickly find phrases and their phrases find prompt expression in policies. What the economists call 'law' they call anarchy. The law which they understand is the positive law of the State... the democratic State which seeks social justice by the path of individual rights. The mechanism of international prices, which signals the world's need from one country to another and invites the nations to produce more of this commodity and less of that, belongs to an entirely different order. It knows no rights, but only necessities. The Australians have never felt disposed to submit to these necessities. They have insisted that their Governments must struggle to soften them or elude them or master them... (Hancock 1930: 86).

The characteristic Australian distrust of market signals and dislike of what Hancock called 'scientific economics' (now known as 'economic rationalism') had its most lasting and influential expression in the celebrated Harvester Judgment in 1907 – just a few months before Keynes' public questioning of the validity of the official estimates of relative real wages in London, the Midlands and Ireland.

HV McKay, the dominant figure in the Australian agricultural implements industry had applied to Mr Justice Higgins, the new President of the Commonwealth Arbitration Court, for a declaration that the wages he paid were 'fair and reasonable', and that therefore his machines should be exempt from the excise duty on harvesters. Higgins rejected the application, on the grounds that the wages paid at the Sunshine harvester plant did not, in his opinion, provide for an unskilled labourer 'the normal needs of an average employee, regarded as a human being living in a civilised community'. Higgins was later to explain the reasoning which led him to this decision in the following terms:

> Many household budgets were stated in evidence, principally by house-keeping women of the labouring class; and, after selecting such of the budgets as were suitable for working out an average, I found that in Melbourne, the average necessary expenditure in 1907 on rent, food

and fuel, in a labourer's household of about five persons was one pound twelve shillings and five pence, but that as these figures did not cover light, clothes, boots, furniture, utensils, rates, life insurance, savings, accident or benefit societies, loss of employment, union pay, books and newspapers, tram or train fares, sewing machine, mangle, school requisites, amusements and holidays, liquor, tobacco, sickness or death, religion or charity, I could not certify that any wages less than 42 shillings per week for an unskilled labourer would be fair and reasonable (Higgins 1915: 15).

As it happens, the information which provided the British Board of Trade with the capacity to calculate relative real wages in different districts of the United Kingdom can also be used, in conjunction with contemporary Australian data on prices in Melbourne, to estimate the relative level of the wage which Higgins believed was necessary to meet the minimum needs of an unskilled labourer and his family.

In Figure 8, the purchasing power over British and Australian food baskets of the wage rate specified in the Harvester Judgment of 10.5 pence per hour (42 shillings for a standard 48 hour working week) is compared with the purchasing power of the hourly wage of an engineering labourer at that time in London, Leicester in the English Midlands and Dublin. As the figure shows, the Harvester rate was, in real terms, *twice* the London rate and *three times* the prevailing rate in Dublin.
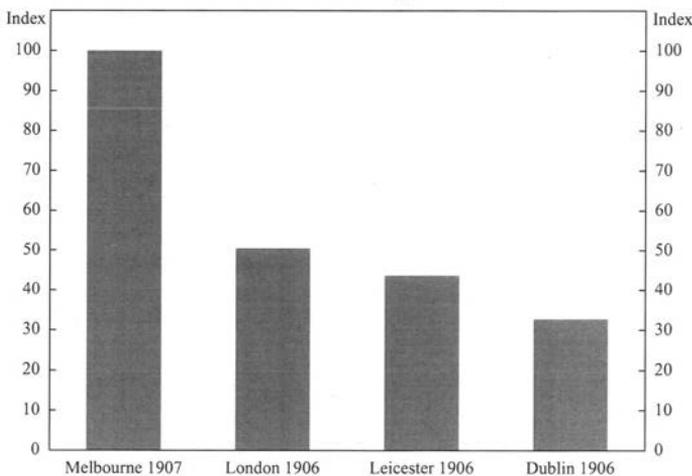

Figure 8 Purchasing power of unskilled labour (Melbourne, Harvester Judgment = 100)

Source: See Appendix.

The scale of the 'average necessary expenditure...on rent, food and fuel' for a family of five in Melbourne in 1907 was a matter of opinion, and the level

which was judged by Higgins to be necessary was austere by the standards of the 1990s. But it was certainly not austere by the British standards at that time, and it was far above the standards which prevailed in the leading cities on the continent of Europe.

The real quantities of housing, food and fuel which could have been bought in Melbourne in 1907 with a weekly sum of 'one pound twelve shillings and five pence' were considerably greater than the quantities in the basket used by the British officials to judge the relative costs of living in different cities in the United Kingdom in 1908; and it would in any case have been impossible at that time for unskilled labourers in Britain (or anywhere in Europe) to earn a wage sufficient for the assessed needs of a family of five.

In Higgins' view – and it was a view which had the support of most Australian politicians at the time – an industry which could not afford to pay the level of wages that the Arbitration Court judged to be 'fair and reasonable' should not receive protection. The practical consequence of this view was that many Australian industries had to be supported by high and increasing levels of protection in order to survive and to pay the wage rates decreed by the Arbitration Court.

10. The league table before the wars

According to the estimates charted in Figure 2, Australia's level of real GNP per capita was only slightly higher than that of the United Kingdom in the years preceding World War I. Acknowledging that there are significant differences between the concepts being measured, this does not appear to be consistent with the large differences in real wage rates which were discussed in the preceding section and illustrated in Figure 8.[35]

The probable reason for the apparent inconsistency is that the relativities shown in Figure 2 are not correct. In previous sections of this paper, it was shown that average real incomes in Australia in the 1990s are probably substantially higher, relative to those in many other countries including the United Kingdom, than the conventional estimates on a PPP basis show. If this is the case, the relativities in the estimates which would be backcast to 1900 are equally astray.

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35 Williamson (1991) puts the real wage rate for manufacturing workers in Australia 15 per cent above the UK real wage rate and 40-60 per cent above real wage rates in other European countries, but well below those of the United States and Canada. Williamson's comparative real wage data are based on national data for nominal wages and retail prices but then converted into comparable figures using PPPs for four benchmark years. They are thus subject to the problems discussed earlier.

And differences in the end-point relativities are only one of the possible sources of error in the long-period estimates. There would be serious hazards in the backward projection of national estimates of real product over long periods, even if the underlying information was of high quality and the changes in economic structure were modest.[36]

It follows that estimates of relative average real income levels in past periods can only be relied upon if they are built up from contemporary data, and that the use of year-by-year estimates of GDP at constant prices should be restricted to the identification of the profile of short-run changes. Over long periods, economic growth rates should be seen as summary measures of the apparent rate of movement which has been observed between successive 'snapshots', not as the means by which the scale of change between two distant years can be determined.

There is, however, an important advantage of the 'snapshot' approach to the measurement of relative real average incomes between countries and over time. The approach does not require that estimates be made of every individual expenditure component and every individual price parity – a procedure which, as we have seen, is difficult enough to achieve contemporaneously. Instead, it can rely on the approach which Ronald Walker suggested would prove to be more useful in any case: 'the comparative study of the actual content of typical family budgets of different classes in the relevant countries' (Butlin 1962: 10).[37]

Some preliminary estimates based on this approach were made for five countries in the pre-World War I period, using official family budget studies, and are exhibited in Figures 9 and 10. The results bring out very marked differences between the patterns of expenditure in, on the one hand, the United Kingdom and France and, on the other, the United States, Australia and New Zealand. The estimates also provide pertinent information on the relative positions and average levels between countries. These clearly suggest that the differences in real average incomes between the countries of the Old World and the 'NIEs'

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36   For the period before the commencement of the official estimates, the Australian estimates of real product are derived from Butlin (1962). In that monograph Butlin states that 'any attempt to deflate series of gross domestic product and gross capital formation over long periods must be regarded with the greatest suspicion; our attempt is no exception' (31). Despite Butlin's emphatic disclaimer, Australian and international scholars have relied upon his estimates to assess the level of average Australian incomes, relative to those in other countries, in the relevant period.

37   In June 1995, the Australian Bureau of Statistics published *A Provisional Framework for Household Income, Consumption, Saving and Wealth* (ABS Cat.No.6549.0) which defined a conceptual map relating data in these fields, so as to lay the foundation for the further development of statistics concerning the economic wellbeing of households. It is in this area that the more cohesive development of consistent and relevant definitions and concepts, nationally and internationally, is most necessary in order to support the information needs of policy makers.

of those days were much larger than the presently accepted estimates, which have been derived as an outcome of the backward projection of modern PPP calculations.
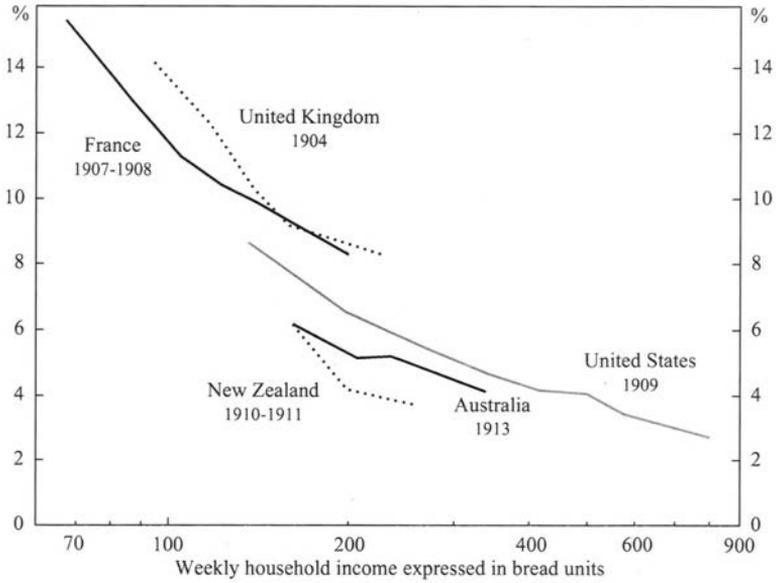

Figure 9 Expenditure on bread and flour as a percentage of income (1904-1913)
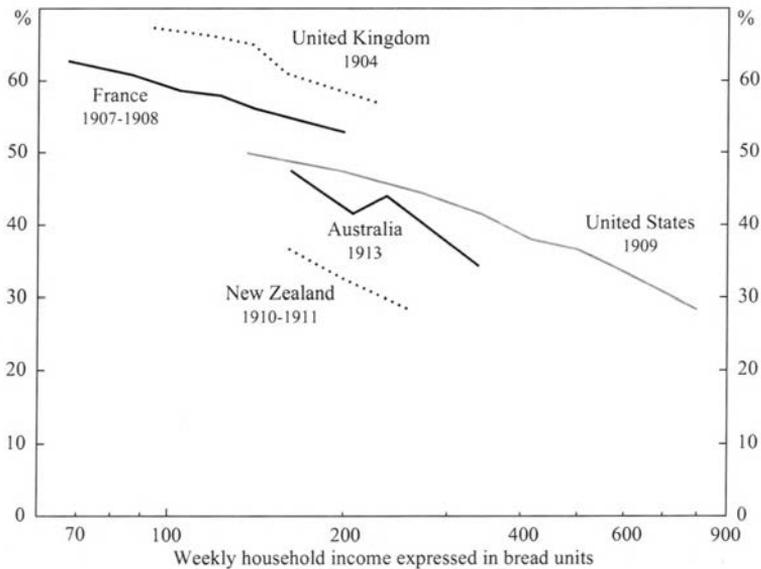
Source: See Appendix.

Figure 10 Expenditure on food as a percentage of income (1904-1913)

Source: See Appendix.

11. Conclusion

Our review of the available evidence about relative living standards and real incomes in the Australia of the 1990s reveals a need for great caution. Nonetheless, economists and national-accounting statisticians of the late 20th century have been comfortable with expressing diverse observations as averages, and then adjusting and manipulating those averages according to hypothetical assumptions – such as that prices are constant or that prices are the same as somewhere else or everywhere else. Although these simplifications are necessary if inter-country and inter-temporal comparisons of real incomes are to be made at all, it should not be forgotten that they not only involve summarisation (i.e. the loss of some part of the truth), but also the making of assumptions which do not hold in (and may often differ markedly from the facts of) the real world.

This need for caution combined with the results of the review makes it reasonable to conclude that the concerns that have their origin in Australia's position in the conventional league table are misplaced. The statistics are subject to measurement errors which are potentially large enough to invalidate the conclusions commonly drawn from them. Even if the measurement problems could be resolved there are important conceptual issues which would remain. The representation of the outcome of macroeconomic performance by a single measure involves an excessive degree of summarisation and loss of detail. Consequently, the policy issues surrounding Australia's comparative position and performance must be addressed within a multi-dimensional framework that acknowledges the serious and possibly fatal weaknesses of conventional statistical measures in capturing the scale and the subtlety of economic change. In particular, it must recognise the features which distinguish Australia from other modern societies.

Our review also shows that league tables for the early part of this century (often produced by backcasting current figures) are equally misleading. Australia, at that time, was a country with a small population and labour force relative to its abundant natural resources. Moreover, a distinctive feature of Australia was the setting of comparatively high real wages. Indeed, this was the mechanism by which the high real incomes generated in the resource-based industries were transferred to provide the owners and workers in many other industries with higher incomes than the PPP-adjusted value of what they had produced.

We have emphasised the statistical and conceptual problems in measuring the comparative position of Australia, but we would not seek to deny that there has been some considerable 'sliding down the international league scale' during this century. Yet again, however, the concerns expressed in reactions to the World Bank's league table seem, at least in part, to be misplaced. To start with the part

where there are genuine reasons for concern, there is little doubt that attempts to protect economic factors from foreign competition and the cost of change has been a principal constraint on economic growth. To quote Gruen, growth was sacrificed because '...our social organisation tended to produce that outcome' (Gruen 1986: 193). However, two other factors have also been at work and do not give cause for concern because they are the direct outcomes of Australia's unique position early this century and of the responses of Australian institutions to that position. First, to the extent that Australians place different values on work and leisure than other countries and give a relatively high priority to those aspects of life which are not included in the conventional national accounts, *measured* growth rates will be relatively low. Second, Australia provided its contribution to the international process of convergence of per capita income by choosing to distribute the resource wealth through relatively high real wages and encouraging a wider dispersion of resources through fast population and labour force growth. In fact, this, more than any other factor, may explain the relatively slow growth in average per capita real incomes in Australia through this century.

Appendix: Data sources for figures and tables

Figure 2 Real GNP per capita in selected economies (1900-1993)

Estimates of 1993 real GNP per capita are PPP estimates sourced from the *World Bank Atlas 1995*: 18-19). For recent years these estimates are backcast for Australia, Canada, France, Germany Italy, Japan, Netherlands, Norway, Sweden, Switzerland, UK and US using growth rates in GDP per capita calculated using estimates of population and constant price GDP reported in IMF (1995). The estimates were then backcast from 1989 using movements in GDP reported in Tables A6, A7 and A8 of Maddison (1991) and movements in population reported in Tables B2, B3 and B4 of Maddison (1991). For the remaining countries, comparable series were produced using the sources reported in the list below.

Figure 3 Relative prices and relative quantities consumed in Australia and Hong Kong in 1985

Relative quantities consumed were derived from Table 1 of UN (1994), setting relative GDP in each country to 100. Relative prices were derived from Tables 10 and 1 of the same publication, by dividing the nominal expenditures in Table 10 by the quantities reported in Table 1, setting the relative price of GDP to 100.

Figure 4 Expenditure shares excluding housing in Australia and Hong Kong

Australia: ABS Household Expenditure Survey 1988-89 (ABS Catalogue Nos 6530.0 and 6535.0). Hong Kong: Hong Kong Year Book 1989-90, Expenditure Weights.

Figure 5 Gross rent in selected OECD countries

Gross rent and water charges item of OECD (1992, Table 1.3).

Figure 6 Real expenditure on medical care in 1985 v. numbers of physicians and nurses (Australia = 100)

Data on per capita real expenditure on medical care at international prices were obtained from UN (1994,Table 3). Data on physicians and nurses per 1,000 inhabitants were obtained from the World Health Organisation.

Figure 7 GDP per capita expressed as an index of selected baskets of goods and services

Nominal GDP estimates in national currencies for second quarter 1994 were obtained from IMF (1995). Latest IMF (1995) nominal GDP estimates were for Singapore, Argentina, Indonesia and Malaysia were for 1993; and 1992 for Luxembourg and Thailand. Estimates for 1992 and 1993 were converted to 1994 prices using consumer price indices published in IMF (1995). These estimates were divided by population estimates for each country, obtained by extrapolating 1993 mid-year population estimates by the average population growth rate for the period 1988 to 1993, with population statistics sourced from IMF (1995). For Hong Kong, 1993 GNP per capita in US$ was obtained from World Bank (1995), converted to local currency, and converted into 1994 prices using consumer price index data sourced from *Hong Kong Monthly Digest* of *Statistics,* March 1995 (Census and Statistics Department, Hong Kong).

Prices of commodity baskets were obtained from Union Bank of Switzerland (1994). Nominal GDP per capita was then divided by the cost of each of these baskets, with the resultant index set to 100 for Australia. The clothing index is a weighted average of the separate indices for women's clothing (60 per cent weight) and men's clothing (40 per cent weight). Automobile cost includes taxes and the cost of a 15,000-kilometre service. The short stay basket is made up of an overnight stay for two in a hotel, two evening meals with a bottle of red house wine, a taxi ride within the city centre, a rental car for half a day, cinema tickets for two, two 'Big Macs' and two public transport tickets.

Figure 8 Purchasing power of unskilled labour (Melbourne, Harvester Judgment = 100)

Australia: Commonwealth Bureau of Census and Statistics, Labour and Industrial Branch Report No. 2: 47.

UK: Report of an Enquiry by the Board of Trade into Working-class Rents, Housing and Retail Prices, Together with the Standard Rates of Wages Prevailing in Certain Occupations in the Principal Towns of the United Kingdom, Great Britain Parliament, Accounts and Papers (1908).

Derived as a geometric mean of indices of purchasing power over Australian and UK consumption baskets, with Melbourne set to 100.

Figure 9 Expenditure on bread and flour as a percentage of income (1904-1913) and Figure 10 Expenditure on food as a percentage of income (1904-1913)

Australia: Commonwealth Bureau of Census and Statistics, Labour and Industrial Branch Report No. 4: 13, 19, 26.

France: *Report of an Enquiry by the Board of Trade into Working Class Rents, Housing and Retail Prices, Together with the Rates of Wages in Certain Occupations in the Principal Industrial Towns of France*, Cd.4512(1909).

New Zealand: New Zealand Government Department of Labour, *Inquiry into the Cost of Living in New Zealand, 1910-11* (1912): 10, 13, 22. Flour consumption was estimated to be 30 per cent of bread consumption.

United Kingdom: *Report of an Enquiry by the Board of Trade into Working-class Rents, Housing and Retail Prices, Together with the Standard Rates of Wages Prevailing in Certain Occupations in the Principal Towns of the United Kingdom*, Great Britain Parliament, Accounts and Papers (1908).

United States: *Report of an Enquiry by the Board of Trade into Working-class Rents, Housing and Retail Prices, Together with the Standard Rates of Wages Prevailing in Certain Occupations in the Principal Towns of the United States of America 1909* (1911).

Table 1 GNP per capita at purchasing power parities in 1993 international dollars

World Bank (1995).

Table 2 Per capita real value of final expenditure on gross rents at international prices in 1985 US dollars

UN (1994).

Table 3 Alternative league tables

The World Bank 1993 ranking is sourced from World Bank (1995).

Country	Dates	Data Sources
Argentina	1900-50	Data for 1890, 1913, 1950 are available from Maddison (1993); exponential interpolation is used to produce an annual series
	1950-90	Penn world Table (Mark 5.6a)
	1990-93	IMF (1995)
Korea	1900-53	Interpolated series using data for 1890, 1913, 1950, 1973 from Maddison (1993)
	1953-90	Penn World Table (Mark 5.6a)
	1990-93	IMF (1995)
Thailand	1900-50	Interpolated series using data for 1890, 1913, 1950 from Maddison (1993)
	1950-91	Penn World Table (Mark 5.6a)
	1991-93	Asian Development Bank, Asian Development Outlook
Indonesia 1900-60	1900-60	Interpolated series using data for 1890, 1913, 1950, 1973 from Maddison (1993)
	1960-92	Penn World Table (Mark 5.6a)
	1993-93	IMF (1995)
Hong Kong	1960-92	Penn world Table (Mark 5.6a)
	1992-93	Asian Development Bank, Asian Development Outlook
Malaysia	1955-92	Penn World Table (Mark 5.6a)
	1992-93	IMF (1995)
Philippines	1900-50	Interpolated series using data for 1900,1913, 1929, 1938, 1950 from Maddison (1989)
	1950-92	Penn World Table (Mark 5.6a)
	1992-93	IMF (1995)
Singapore	1960-92	Penn world Table (Mark 5.6a)
	1992-93	IMF (1995)
New Zealand	1951-92	Penn world Table (Mark 5.6a)
	1992-93	IMF (1995)

For the Big Macs 1993 ranking, nominal GDP per capita in 1993 was calculated employing the same methods and sources used for Figure 7. These estimates were then divided by the local currency price of a Big Mac in 1993, sourced from *The Economist,* 17 April 1993: 83. 1994 Big Mac prices were used for Singapore and

Austria from *The Economist*, 9 April 1994: 92. 1995 Big Mac prices were used for Indonesia and Thailand from *The Economist,* 15 April 1995: 78. An index was then constructed with Australia set to 100.

The UBS 1994 ranking was calculated in the same manner and using the same sources that were employed in constructing the indices plotted in Figure 7. The relative cost of the UBS basket of 108 goods and services (excluding rents) in the different countries was adjusted to reflect rents by multiplying the cost of that basket by the UBS index of prices including rent and dividing by the UBS index of prices excluding rents.

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