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Assessing Well-being Using Hierarchical Needs

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Abstract

Determining whether well-being has improved is an important multidisciplinary task. It is important therefore to develop a multidimensional measure of well-being that reflects a wide spectrum of human needs. A new approach is presented in this paper based on multidimensional hierarchical human needs and motivation. Improving well-being within this multidimensional approach requires progressive satiation of hierarchical needs. Eight indicators have been chosen to reflect these four hierarchical categories. This paper empirically applies this new measure of well-being to eight Southeast Asian countries for the period 1985-2000: Cambodia, Indonesia, Lao PDR, Malaysia, Philippines, Singapore, Thailand and Vietnam. Results for Australia are also provided as a comparative benchmark.

Keywords: well-being, Maslow, Southeast Asia

JEL classification: I31, O15, O57

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1 Introduction

Determining whether well-being in developing countries has improved is an important multidisciplinary task. Numerical measures of well-being are becoming increasingly common and numerous methods of measurement now exist. This paper provides a systematic empirical study of well-being in Southeast Asia.

Common measures of well-being include single representative indicators such as gross domestic product (GDP) per capita, life expectancy or literacy rates, or composite indicators using various combinations of these, such as the human development index (HDI) (UNDP 2003) or the physical quality of life index (PQLI) (Morris 1979). This paper argues that widely accepted measures of well-being, both representative (that is, GDP per capita) and composite (that is, HDI) fail to fully capture actual movements of well-being within nations across time. The weaknesses of both are well known within the literature (see for example, McGillivray 1991; Clarke and Islam 2004). Therefore, it is important that well-being measures reflect a wide spectrum of human needs. One way to represent this multidimensionality is to consider hierarchical human needs. Whilst some relative reporting in terms of well-being in the form of hierarchical needs has been undertaken (Daly 1996), the empirical implication of this approach to determine and measure well-being in terms of hierarchical needs is limited.

Improving well-being within this approach requires progressive satiation of hierarchical needs. This hierarchical approach is underpinned by a rigorous psychological theory of human motivation (Maslow 1970), where hierarchical human needs are classified into various categories, including (i) basic, (ii) safety, (iii) belonging and (iv) self-esteem needs. This highest level of need is self-actualization. Becoming self-actualized is predicated on the attainment or fulfillment of the lower level needs. Therefore, the concept of self-actualization can be considered analogous with Sen's concept of capabilities (Sen 1985; 1987a; 1987b) and Doyal and Gough's (1991) concept of social and critical participation. Within this paper therefore, well-being is defined as a function of the extent to which society facilitates the attainment or fulfilment of the ultimate hierarchical need: self-actualization.

It is possible to operationalize this approach by identifying outcomes and indicators that represent or correspond to the four lower levels of needs upon which the achievement of self-actualization is predicated. Eight indicators have been chosen to reflect these four hierarchical categories. A composite indicator of these eight indicators will be calculated using an approach similar to that of the HDI. Weights will also be assigned to the different levels within this hierarchy to reflect the shift from minimally adequate standards to higher levels of well-being within nations. This paper empirically applies this new measure of well-being to eight Southeast Asian countries for the period 1985-2000. The countries surveyed are Cambodia, Indonesia, Lao PDR, Malaysia, Philippines, Singapore, Thailand and Vietnam. In addition, results for Australia are also provided as a comparative benchmark.

The results of this new approach show a general increase of well-being based on the attainment of hierarchical needs recorded across the region over the past sixteen years. This paper concludes that policymakers must consider multidimensional human needs

and motivation when seeking to improve well-being through economic and social development activities.

The paper is divided into six sections. The second section introduces Maslow's framework of hierarchy of needs before Section 3 discusses how this approach could be utilized to measure well-being. Section 4 discusses how this new approach is operationalized. The findings of this new approach to well-being measurement based on the fulfillment of hierarchical needs are reviewed in Section 5, and the final section summarises the paper.

2 Maslow's hierarchical framework

A universally accepted definition of well-being does not exist. However, it is possible to list various components that must be considered when developing a measure of well-being. For example, Nussbaum (2000) identified emotions, bodily integrity and health, social basis of self-respect, freedom from discrimination, and control over environment, and Doyal and Gough (1991) identified physical security, economic security, opportunities to participate and cognitive and emotional capacity.

Maslow's (1970) hierarchy of human needs and motivation theory was initially proposed to explain human motivation. It was a psychological theory focussing on workplace behaviour rather than a theory of well-being. Within the *hierarchy of human needs*, human well-being is bounded by the fulfillment of a given set of ascending needs that can be divided into five categories (from lowest to highest): basic, safety, belonging, self-esteem and self-actualization (Maslow 1970). Human effort is exerted to achieve each level. The primary need that must be fulfilled are those basic needs such as food, shelter and water. Until these needs are fulfilled, higher needs are not considered. However, once these needs are achieved, consideration moves to the next tier of needs. The ultimate need to which humans aspire is self-actualization. All behaviour is therefore motivated by the desire to fulfill one's own potential.

Maslow's theory of human need and motivation is suited to underpin a measure of well-being, as it provides an explanation of what is required to improve life outcomes. This hypothesis argues that the fundamental or ultimate needs of all human beings do not differ nearly as much as do their conscious everyday desires. A measure of well-being that focuses on these fundamental needs can be applied across societies and time as fundamental needs are universal, whereas daily desires differ both intertemporally and interspatially. This approach is not dissimilar to that presented in Doyal and Gough (1991) and Nussbaum (1992; 1993; 2000). Whilst local cultures may determine specific roads to achieve these ends, these ends themselves can be considered universal (Maslow 1970). Thus needs are achieved through what Max-Neef (1991) coins 'satisfiers' (see Kamenetsky 1981 for a similar approach). Satisfiers change according to each culture and even differ within each culture, but the underlying needs remain constant.

The first set of hierarchical needs identified by Maslow is *basic needs*. Basic (or physiological) needs include air, water, food, sleep and sex. Unsatisfied basic needs cause feelings of pain, illness and discomfort. Until these needs are satisfied, attention to higher needs is not possible. The attainment of basic needs occurs at a low level of

income. Their satisfaction is an absolute outcome and not dependent on increasing income (also see Hirsch 1995, for a description of the *Paradox of Affluence* where higher income and consumption do not increase well-being). The second group is *safety needs*. These needs are psychological rather than physiological and take the form of home and family. Within the approach used in this paper, the attainment of safety needs is not specifically dependent on income. Indeed, other than basic needs, income levels are specifically not important in increasing well-being within this hierarchical needs fulfillment approach. The third level of need is *belonging needs*: human desire to belong to groups such as clubs, work groups, families or gangs. This level of needs incorporates the need to feel (non-sexual) love and acceptance by others. Closely related to this is the fourth level, self-esteem needs. Once people belong to groups, they seek to be admired by those around them. Self-esteem can be brought about through the mastery of skills or attention and recognition from others. Finally, once these four levels of needs have been satisfied, a person can become self-actualized. Self-actualization is an ongoing process. It is the need to be what one was born to be. It is self-fulfillment of one's own potential. Self-actualization can be considered analogous to capability (Sen 1985; 1987a; 1987b; Nussbaum 1988) and social and critical participation (Doyal and Gough 1991).

The concept of hierarchy can be criticized however. Whilst Doyal and Gough (1991) utilize a hierarchical concept in their theory of human needs, they do so only in a methodological sense. They argue that health and autonomy are fundamental universal needs in a thin, Kantian sense. Then, using codified knowledge, it is possible to identify universal satisfier characteristics that everywhere contribute to these. But all are simultaneously necessary even for low levels of functioning. Similarly, Max-Neef (1991) argues that a range of human needs (subsistence, protection, affection, understanding, participation, idleness, creation, identity and freedom) exist, but they do so simultaneously and are therefore non-hierarchical.

This divergence between hierarchical and non-hierarchical can be bridged though. Maslow notes that the dominant need is always shifting so that a self-actualized person does become hungry and tired and this basic need becomes the priority. The implication of this shifting dominated need or non-hierarchy of needs is that policies aimed at maximizing well-being must be more sophisticated to consider explicitly the various forms of needs and their relative significance in achieving optimal well-being. Developing a social welfare function on Maslow's approach to hierarchical need fulfillment encourages this outcome.

3 Fulfilment of hierarchical needs and well-being

This approach does not seek to use the Maslow approach to predict patterns of economic development. Rather, it draws on Maslow's description of needs to measure well-being. Rather than predicting paths of development, this paper is interested in measuring well-being in a manner, which until now has not been undertaken. Maslow did not intend his theory of needs to be used outside of management psychology, however recent studies (Sirgy 1986; Hagerty 1999) have widened its use to consider development and well-being issues.

Hindrances constructed by society can prevent people reaching the highest level of self-actualization. That is why hierarchical needs fulfilment can be applied to well-being measures. This approach can demonstrate whether a society is assisting or hindering its citizens from becoming self-actualized. Societies that enable their members to achieve each level of this hierarchy will have higher levels of well-being.

As this approach to well-being is underpinned by a theory of hierarchical needs, appropriate weights are given to the different levels of needs. In this approach therefore, needs at the higher level of the hierarchy are given more weight than those at the lower end of the hierarchy. The use of weights in this fashion demonstrates that the hierarchical structure of needs has been explicitly considered in the conceptualization and measurement of well-being since different hierarchical structures of needs provide different types and levels of well-being.

Table 1 summarizes the well-being outcomes associated with each level of need.

Table 1

Selected well-being outcomes and indicators that correspond to Maslow's categories of needs

Maslow's categories of needs	Some well-being outcomes that correspond with this need
Basic (physiological)	— Healthy
	— Vitality
Safety	— Safe
	— Settled
	— Secure
Belonging	— Included
	— Loved
	— Participating
Self-esteem	— Empowered
	— Confident
	— Convivial
Self-actualization	— Actively seeking knowledge
	— Inspired to reach potential

It is possible to operationalize this approach by identifying outcomes and indicators that represent or correspond to the four lower levels of needs upon which the achievement of self-actualization is predicated. Eight indicators have been chosen to reflect these four hierarchical categories. The indictors selected are:

Basic

- Daily calories available per person
- Access to safe water

Safety

- Infant mortality
- Life expectancy

Belonging

- Telephone mainlines
- Fertility rates

Self-esteem

- Adult illiteracy
- Unemployment

Significant literature exists regarding the identification of basic needs (see Streeten 1995 for a summary of the issues surrounding this area). Two measures have been chosen as indicators for this first level of need; calories per person and access to safe water. Without sufficient food or sufficient water quality, long-term survival is not possible. Having attained the lowest level of needs required, attention would focuses on achieving a feeling of safety. Two indicators of safety have been chosen to measure this: infant mortality and life expectancy. Infant morality reflects the safety of society's most vulnerable members (unborn and new born babies) and life expectancy is a reasonable measure of how safe one's life is across society. The relationship one has with one's own family is often rated highly as a factor of self-reported happiness. In this sense fertility rates represent belonging to a family. Belonging to the wider society is represented by telephone mainline connections and fertility rates. Adult illiteracy rates and unemployment rates have been selected to represent the concept of self-esteem.

Whilst Hagerty (1999) proposed the indicators that form the basis for this new measure, the ultimate choice of indicators must based on society's preferences and value judgements. To this end, Doyal and Gough (1991: 141) adopt a dual strategy of social policy formation in which decisions are made using 'both the codified knowledge of experts and the experimental knowledge of those whose basic needs and daily life world are under consideration'. This approach bears strong resemblance to normative social choice theory (Clarke and Islam 2004). Normative social choice theory is concerned

with how the preferences, value judgments and choices of society can be identified and measured. Traditionally, voting systems were the primary focus within this theory. However, it is possible to extend this theory to measure well-being. Normative social choice theory should be applied to well-being measures as it highlights social preferences and value judgments. It is concerned with economic and non-economic activities that are important in determining well-being levels, quality and composition. Normative social choice theory can highlight changes within society and how these changes impact on well-being. Applying normative social choice theory to measuring well-being is dependent upon four operations determining: (1) whose well-being is being measured; (2) whether the well-being of the group is different or equal to the sum of well-being of the group's individual members; (3) how distribution of the individual well-being effects the group's well-being; and (4) how to aggregate individual well-being to determine the level of group well-being (Bonner 1986).

It is acknowledged that all indicators have limitations. However, it is argued that the selected indicators are robust enough to provide a solid basis for this application and subsequent analysis. Each indicator has been selected to represent the various concepts encapsulated in each level of need. The criteria upon which these indicators have been chosen are reliability, availability, reliance and timeliness (Baster 1972). It is acknowledged that no indicator is perfect and strong arguments for alternative choices can be made.

4 Operationalizing the fulfilment of hierarchical needs index (FHNI)

Having determined the indicators representing each set of hierarchical needs leading to well-being or self-actualization, it is necessary to construct a social welfare function to operationalize the fulfilment of hierarchical needs index (FHNI).

The social welfare function is:

$$WB = SA(\alpha_1 BN, \alpha_2 SN, \alpha_3 BlN, \alpha_4 SEN)$$

where: WB = well-being

SA = self actualization

BN = basic needs

SN = safety needs

BlN = belonging needs

SEN = self esteem needs

$\alpha_1, \ldots, \alpha_5$ are the weights assigned to each set of needs.

4.1 Weights

If well-being (or self-actualization) is achieved through the attainment of various hierarchical components, a decision must be made as to the importance of the different components with respect to their impact on well-being. A decision therefore must be made as to the relative importance between the hierarchical components within that functional relationship.

As an aggregation of different components or as a function of separate forms, weighting is an important issue when measuring different levels of well-being.

The determination of weights is dependent on various value judgments made explicit within the social welfare function and is based on normative social choice theory (Clarke and Islam 2004). Even when explicit weights are not defined, a value judgment has been made in that all components are equally weighted. This decision is just as much a value judgment as setting separate weights for each component.

No agreement exists as to how these weights should be determined. A number of various methods have been suggested. First, the decisionmaker unilaterally sets the weights according to their own value judgments on equity (Dasgupta and Pearce 1971). Equity may refer to income levels or be beyond income and may be equity in terms of access to social services, ascetic environments, or satisfactory mental health. Second, the weights may be set to reflect society's preferences on equity reflected in such policy instruments as marginal taxation rates. The justification for this approach is that society, represented through successive governments, has determined that through progressive tax rates, the benefits of those on higher incomes should be weighted less than the benefits of those on lower incomes. As such, the calculation of well-being should be biased in favour of those on lower incomes rather than those on higher incomes as this is society's preferences (Dasgupta and Pearce 1971). Third, a similar approach, first suggested by Foster (1966), has that the aggregation of well-being based on individual well-being be weighted by the ratio of the average national income to the individual's income. Fourth, rather than use the ratio of national average income to individual income, the shape and elasticity of the marginal utility of income could determine the weights. The major difficulty of this approach however rests on the assumption that such a calculation of utility can be determined. Whilst some estimates have been made (see Theil and Brooks 1970 for an example of an early attempt) 'most economists remain unshaken in their belief in the impossibility of measuring differences in the marginal utility of income across individuals' (Pearce and Nash 1981: 27).

Clearly then, weights can take any reasonable form, being only dependent on the value judgments upon which they are based.

Within this paper, the weights are based on a value judgment that the appropriate weights should reflect a hierarchical and linear progression. As the fulfillment of these needs is hierarchical, greater weight is given to the higher needs. As a simple linear progression is used, basic needs are weighted least (×1), safety needs are weighted as twice as important (×2), belong needs three times as important (×3) and self-esteem needs four times as important (×4). This decision is consistent with normative social choice theory in which society's preferences and value judgments are interpreted by the analyst (Bonner 1986).

4.2 Aggregation

The estimation of this measure of well-being relies on aggregating changes in illiteracy rates, calorie intake, access to water, fertility, and so on. Such an aggregation requires finding a common denominator. A *normalized* index for each component can be calculated in order to find this common denominator. A normalized index is calculated by dividing each year's figure by the highest figure occurring throughout the time series. Such an index therefore compares movements within a span of numbers rather than the numbers themselves. By using this approach, different indicators can be compared (and aggregated).

This approach is similar to that used in calculating the HDI (UNDP 2003) with one significant difference. Within the HDI, the normalized number is calculated by comparing one country's performance against the performance of all other countries for that year. Thus, countries are ranked against one another. In the approach taken in this paper, a country is compared against itself over the period being reviewed (that is, 1985-2000). Thus comparisons between countries are actually comparisons of how countries have improved (or worsened) relative to their own standards. Therefore, whilst the indicators across all levels of needs may be substantially higher in 'rich' developed countries, the measurement of well-being will not necessarily be higher in these countries than in countries with lower indicators. This is because well-being is based on movements within these indicators, not on their absolute numbers. Thus, a country with a poor record of infant mortality (of say, 100 in every 1000) will improve in terms of well-being if the infant mortality is reduced over the specified time period, compared to a country with a low level of infant mortality (of say, 10 in every 1000) that remains static.

This outcome could be considered a significant flaw in the calculation of the index of well-being based on the fulfillment of hierarchical needs. It appears to reward countries with low starting points and penalizes countries that are already developed. However, this outcome can also be seen as a major advantage as well. Human beings are adaptive by nature. Small mercies can be found in the most miserable of circumstances and tedium found in lavish surrounds (Sen 1990; Hirsch 1995). If an increase in wealth leads to happiness it is only a temporary situation; a disequilibrium of sorts. 'Happiness is not the results of being rich, but a temporary consequence of having recently becoming richer' (Inglehart 1990 cited in Myers 1999: 3; also see Travers and Richardson 1993; Brekke 1997; Pusey 1998. Ng 2001 provides an extensive review of this literature). Equilibrium will soon return and people's levels of satisfaction will subsequently fall. Thus, increasing well-being is partly dependant upon regular improvements in satiating various hierarchical needs. It therefore may be that well-being within developed nations does plateau at a certain point when all hierarchical needs have been reached. It is not difficult to accept that there maybe a cap on levels of human happiness or well-being (Cummins et al. 2001).

5 Analysis

As this new measure of well-being is based on fulfilling hierarchical needs within society, it is able to provide useful insights into the structure of society in terms of those needs. It provides information on which needs are being successfully attained and which needs are failing to be met. Alternative measures of well-being do not adequately provide such information (Islam and Clarke 2000; 2001).

As discussed in Section 4.1, the components of the FHNI have been weighted in a linear manner so that the highest need (self-esteem) is four times as important as the lowest need (basic) and so forth. The results (see Figure 1) show that well-being, of all countries discussed as defined by the FHNI, has risen over the period 1985-2000.

Interestingly though, this general increase occurs for most countries in a series of rises and falls. Thailand recorded the most striking falls between 1989-91 and 1997-98, the latter being linked to the Asian financial crisis.

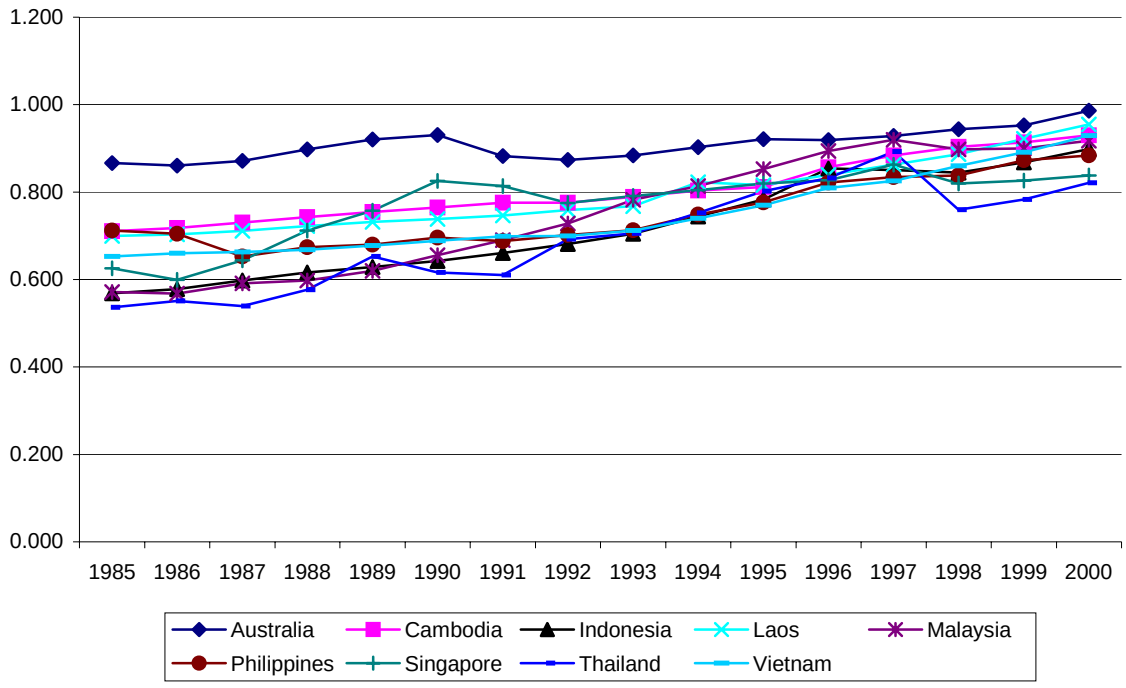

Figure 1
Comparison of FHNI, 1985-2000

5.1 FHNI and GDP per capita

Well-being is often measured by a single, representative indicator—GDP per capita (see for example Gylfason 1999; World Bank 2001). The increase in GDP per capita (constant in 1995 US$) (normalized in the same manner) for this period can be seen in Figure 2. The increase in constant GDP per capita is greater than that experienced in the FHNI. The increase in constant GDP per capita is quite accelerated between 1985 and 1996. Following the Asian financial crisis, the rate of growth within these countries shrank, and was actually negative in a number of countries.

Compared to the large increases in well-being as measured by constant GDP per capita, the rise in well-being as measured by the fulfilment of hierarchical needs is quite modest. The average increase in FHNI between 1985 and 2000 was 39 per cent compared to an average increase in GDP of 70 per cent. The smallest increase in the FHNI was 14 per cent (Australia) compared to 18 per cent for GDP constant per capita (Philippines), but the gap between the maximum increases range from 61 per cent for the FHNI (Malaysia) to 117 per cent for constant GDP per capita (Singapore).

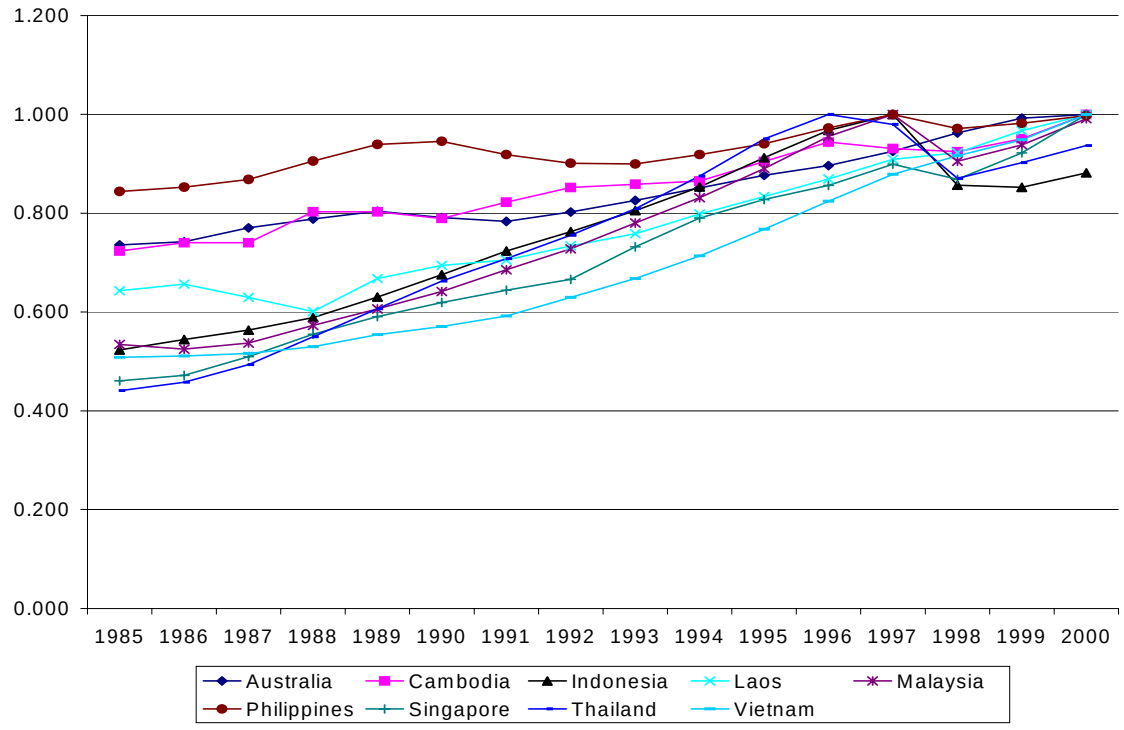

Figure 2

Comparison of GDP per capita (1995 US$), 1985-2000

It may be argued that economic growth therefore has a limited impact on well-being, or at the very least the relationship between economic growth and well-being is overstated. For all countries, FHNI actually rose and fell independently of the accelerated growth in GDP per capita recorded during this period. If well-being is able to fall or remain unchanged during periods of strong economic growth, such growth has arguably limited impact on well-being.

Comparing well-being (measured by FHNI) and economic growth (measured by constant GDP per capita) may provide some new insights into the efficiency of converting income (Y) into well-being:

$$WB = Y\ \alpha$$

where α is the efficiency rate of converting income into well-being.

Ruskin, writing in the mid nineteenth century, defined well-being not simply as the measurement of economic possessions but the capability of utilizing them in an appropriate manner (Smith 1993). Cochrane and Shaw Bell's definition of well-being is based on a similar approach: 'The consuming unit buys food, clothing, shelter, and recreation and transforms them into satisfaction, or utility' (Cochrane and Shaw Bell 1956: 95). Sen (1985; 1987a; 1987b) takes this approach further and argues that well-being is not measured by the possession of a commodity, nor the utility of the commodity, but rather by what the person actually does with the commodity. Sen terms this the 'functioning' of a commodity. Increasing attempts have been made to operationalize Sen's functioning and capability concept (see Comin 2001; Martinetti 2001). Lovell et al. (1993) found that resources are not related strongly to capabilities and therefore the attainment of a high quality of life (capabilities) is not dependent on high levels of material standard of living (resources). The key is the efficiency by which people use their resources (Denison 1971). Thus, efficiency or skills or social habit allow 'people with relatively low levels of resources to lead a relatively high quality of life, and vice-versa' (Travers and Richardson 1993: 48).

Issues such as personal circumstances (including health), the environment, social climate and social state are all contingencies which 'can lead to variation in the 'conversion' of income into the capability to live a minimally acceptable life' (Sen 1999: 360). The importance of Sen's analysis capability is that it allows well-being to be separated from income levels and material well-being.

5.2 FHNI and HDI

It is also useful to compare the results of the FHNI to another measure of well-being; the HDI (UNDP 2003). The HDI is now widely accepted as an alternative measure of well-being. However a significant limitation in terms of capturing multidimensional aspects of well-being is that its three component indicators (life expectancy, literacy and income) are closely correlated to one another and gives rise to claims of redundancy (McGillivray 1991).

The general movement in well-being, as measured by the HDI, is a slight increase over the time period (with the notable fall of Cambodia in the early 1990s) (see Figure 3; also see Appendix 1—Data). The greatest increase in HDI was 18 per cent achieved by Vietnam and Indonesia. The smallest increase was 6 per cent (Cambodia) and the average increase across all nine countries was only 13 per cent (compared to 39 per cent for the FHNI and 70 per cent for GDP per capita). It is important to note though that movement of the HDI represents inter-country comparisons across the three component indicators. This differs significantly from how the FHNI has been developed in which movements are reflections of intra-country movements across eight indicators. This may account for the larger general shift in the FHNI compared to the HDI.

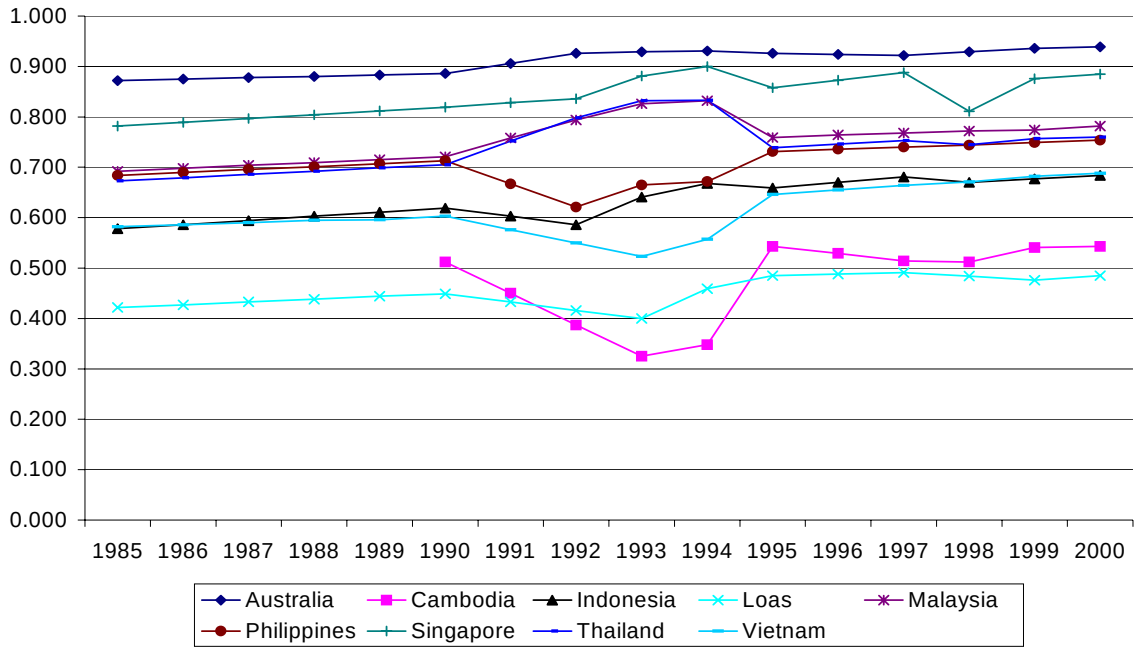

Figure 3
Comparison of HDI, 1985-2000

Source: Various issues of *Human Development Report*.

This focus on intra-country comparisons should be considered a strength of the FHNI as the relevancy of the well-being indicators rests upon their authority in representing shifts in well-being actually experienced by populations. Whilst some aspects of well-being are relative (Atkinson 1983; Kanbur 1987; Thurow 1980; Hirsch 1995; Clayton and Radcliffe 1996), a reduction in a neighbour's well-being does not impact as positively on one's own well-being as an increase in one's own circumstances. The focus on intra-country comparisons is thus valid.

The results of the FHNI, as compared to the HDI, indicate that well-being experienced by these nine countries has increased at a greater rate than indicated by movements in the HDI, but not as great as suggested by movements in GDP per capita.

6 Conclusions

The approach developed in this paper is different to previous extensions of Maslow's approach outside of the realm of management psychology. It is not an attempt to predict movements in development (Hagerty 1999) in a similar vein to Rostow's (1971) stages of growth theory, but rather it is an approach to measure well-being. Countries can increase their well-being without increasing economic growth or even during times of decreasing economic growth (conversely, well-being can fall despite increases in economic growth). Well-being is dependent on fulfilling a given set of hierarchical needs and the role of the state should be to support this attainment. Therefore not only can societies aim to increase total well-being, they can also aim to achieve maximum well-being by recognizing the hierarchical structure of human needs and motivation.

Appendix 1 Data

	Basic needs		Safety		Belonging		Self-esteem	
	Daily calorie intake	Access to safe water	Infant morality	Life expectancy	Telephone mainlines per '000	Fertility rate	Illiteracy rate	Unemploy-ment
Australia								
1985	3091	99.9	9.9	75.7	391.80	1.9	1.0	8.0
1986	3160	99.9	9.9	75.9	405.80	1.9	1.0	8.5
1987	3178	99.9	9.8	76.1	419.10	1.9	1.0	8.1
1988	3196	99.9	9.2	76.4	429.30	1.8	1.0	7.2
1989	3216	99.9	7.7	76.7	441.50	1.8	1.0	6.9
1990	3385	99.9	8.0	77.0	456.30	1.9	1.0	6.9
1991	3305	99.9	7.1	77.2	465.50	1.9	1.0	9.6
1992	3316	99.9	7.0	77.5	472.00	1.9	1.0	10.8
1993	3338	99.9	6.1	77.6	483.50	1.9	1.0	10.9
1994	3288	99.9	5.9	77.7	495.60	1.9	1.0	9.7
1995	3200	99.9	5.7	77.9	492.40	1.8	1.0	8.5
1996	3231	99.9	5.8	78.0	500.70	1.8	1.0	8.6
1997	3224	99.9	5.3	78.1	512.70	1.8	1.0	8.6
1998	3220	99.9	5.0	78.6	509.30	1.8	1.0	8.0
1999	3210	99.9	5.6	78.7	515.30	1.8	1.0	7.2
2000	3298	99.9	4.9	78.9	524.60	1.8	1.0	6.6
Cambodia								
1985	1784	19	95.0	47.1	0.25	6.0	41.6	n/a
1986	1804	19	92.0	47.8	0.25	5.9	40.9	n/a
1987	1893	19	89.0	48.5	0.30	5.8	40.1	n/a
1988	2002	20	86.0	49.1	0.30	5.7	39.3	n/a
1989	2166	20	83.0	49.7	0.30	5.6	38.6	n/a
1990	2114	22	80.0	50.3	0.30	5.6	38.0	n/a
1991	2089	25	81.6	50.9	0.40	5.5	37.5	n/a
1992	2021	25	83.2	51.5	0.40	5.4	37.0	n/a
1993	2030	36	84.8	52.0	0.40	5.2	36.6	n/a
1994	2197	36	86.4	52.5	0.60	5.0	36.1	n/a
1995	2011	36	88.0	52.9	0.80	4.7	35.5	n/a
1996	2045	36	89.4	53.4	1.50	4.5	34.9	n/a
1997	2048	36	90.8	53.9	1.90	4.3	34.2	n/a
1998	2078	38	92.2	53.8	2.10	4.2	33.5	n/a
1999	2103	37	93.6	53.7	2.20	4.1	32.7	n/a
2000	2119	37	95.0	53.8	2.36	4.0	32.0	n/a
Indonesia								
1985	2398	19	69.5	58.6	3.60	3.6	25.4	n/a
1986	2412	22	67.6	59.4	4.00	3.5	24.4	n/a
1987	2572	35	65.7	60.2	4.40	3.3	23.4	n/a
1988	2598	46	63.8	60.7	4.80	3.2	22.4	n/a

Continues…

Appendix 1 Data: continued

	Basic needs		Safety		Belonging		Self-esteem	
	Daily calorie intake	Access to safe water	Infant morality	Life expectancy	Telephone mainlines per '000	Fertility rate	Illiteracy rate	Unemploy-ment
1989	2750	46	61.9	61.2	4.90	3.1	21.5	n/a
1990	2631	47	60.0	61.7	5.90	3.0	20.5	n/a
1991	2763	47	57.2	62.2	7.10	3.0	19.7	n/a
1992	2755	48	54.4	62.7	8.90	2.9	18.9	n/a
1993	2790	51	51.6	63.1	9.90	2.8	18.0	n/a
1994	2812	62	48.8	63.6	12.90	2.8	17.2	n/a
1995	2896	62	46.0	64.1	16.80	2.8	16.5	n/a
1996	2900	63	43.8	64.6	21.10	2.8	15.8	4.0
1997	2886	61	41.6	65.1	24.70	2.8	15.2	4.7
1998	2873	60	39.4	65.4	27.00	2.7	14.5	5.5
1999	2909	64	37.2	65.7	29.00	2.6	13.9	5.5
2000	2893	69	35.0	66.0	32.30	2.5	13.2	5.5
Laos								
1985	2205	22	127.5	47.2	1.60	6.5	47.6	n/a
1986	2088	22	126.0	47.7	1.60	6.4	46.7	n/a
1987	2256	22	124.5	48.2	1.60	6.3	45.9	n/a
1988	2398	25	123.0	48.7	1.60	6.2	45.1	n/a
1989	2630	27	121.5	49.2	1.50	6.1	44.3	n/a
1990	2475	29	120.0	49.7	1.60	6.0	43.5	n/a
1991	2378	32	117.0	50.2	1.60	5.9	42.7	n/a
1992	2259	34	114.0	50.7	1.90	5.8	41.9	n/a
1993	2233	36	111.0	51.0	1.90	5.7	41.0	n/a
1994	2198	45	108.0	51.4	3.90	5.6	40.2	n/a
1995	2175	39	105.0	51.8	3.50	5.5	39.4	n/a
1996	2056	44	102.0	52.1	4.10	5.4	38.6	n/a
1997	2108	44	99.0	52.5	4.80	5.3	37.7	n/a
1998	2100	45	96.0	52.9	5.50	5.2	36.9	n/a
1999	2099	49	93.0	53.3	6.60	5.1	36.1	n/a
2000	2106	48	90.0	53.7	7.78	5.0	35.2	n/a
Malaysia								
1985	2684	44	23.5	68.8	61.40	4.1	23.7	6.9
1986	2617	48	22.0	69.1	65.20	4.1	22.8	8.3
1987	2698	59	20.5	69.5	68.40	4.0	22.0	7.3
1988	2701	51	19.0	69.8	73.60	3.9	21.1	7.2
1989	2774	51	17.5	70.1	80.00	3.9	20.2	6.3
1990	2697	58	16.0	70.5	89.20	3.8	19.3	5.1
1991	2765	65	15.5	70.8	99.10	3.7	18.6	4.3
1992	2884	71	15.0	71.2	111.40	3.6	17.9	3.7
1993	2876	78	13.7	71.3	125.40	3.6	17.2	3.0

1994	2893	78	12.3	71.6	145.60	3.5	16.4	2.9
1995	2873	88	11.0	71.7	165.70	3.4	15.7	2.8
1996	2938	90	10.3	71.8	178.10	3.3	15.1	2.5
1997	2977	93	9.5	71.8	194.80	3.3	14.5	2.5
1998	2970	93	8.3	72.0	201.50	3.2	13.8	3.2
1999	2986	92	7.9	72.3	202.90	3.1	13.2	3.4
2000	2964	92	7.9	72.5	199.16	3.0	12.6	3.1
Philippines								
1985	2309	68	55.0	63.4	9.30	4.5	10.0	6.1
1986	2204	68	53.0	63.8	9.50	4.4	9.7	6.4
1987	2284	67	51.0	64.2	9.50	4.3	9.3	9.1
1988	2340	70	49.0	64.7	9.70	4.2	9.0	8.3
1989	2375	71	47.0	65.1	9.90	4.2	8.7	8.4
1990	2452	75	45.0	65.6	10.00	4.1	8.3	8.1
1991	2386	75	43.2	66.0	10.40	4.1	7.9	9.0
1992	2258	79	41.4	66.5	10.30	4.0	7.6	8.6
1993	2205	82	39.6	66.9	12.10	3.9	7.2	8.9
1994	2309	83	37.8	67.3	16.50	3.9	6.9	8.4
1995	2373	85	36.0	67.7	20.50	3.8	6.5	8.4
1996	2363	83	34.8	68.1	25.50	3.7	6.2	7.4
1997	2425	85	33.6	68.5	28.60	3.6	5.9	7.9
1998	2469	85	32.4	68.7	34.10	3.6	5.6	9.6
1999	2860	85	31.2	69.0	38.80	3.5	5.4	9.6
2000	2801	87	30.0	69.2	40.02	3.4	5.1	10.1
Singapore								
1985	3098	99.9	9.4	72.8	294.20	1.6	14.4	4.1
1986	3080	99.9	7.4	73.2	307.80	1.4	13.8	6.5
1987	3087	99.9	7.4	73.5	319.30	1.6	13.1	4.7
1988	3105	99.9	7.0	73.8	329.80	2.0	12.5	3.3
1989	3198	99.9	7.5	74.0	340.50	1.8	11.8	2.2
1990	3114	99.9	6.7	74.3	349.40	1.9	11.2	1.7
1991	3167	99.9	5.5	74.5	356.30	1.8	10.9	1.9
1992	3186	99.9	5.0	74.8	367.80	1.8	10.5	2.7
1993	3204	99.9	4.7	75.5	382.10	1.8	10.1	2.7
1994	3195	99.9	4.7	76.3	395.90	1.8	9.7	2.6
1995	3220	99.9	4.0	76.4	411.90	1.7	9.3	2.7
1996	3244	99.9	3.6	76.7	432.60	1.7	9.0	3.0
1997	3282	99.9	3.6	77.0	450.90	1.6	8.8	2.4
1998	3299	99.9	4.1	77.4	459.90	1.5	8.4	3.1
1999	3266	99.9	3.2	77.5	481.90	1.5	8.1	4.1
2000	3244	99.9	2.9	77.9	484.48	1.5	7.7	4.4
Thailand								
1985	2178	38	39.5	65.8	12.60	2.8	9.8	3.7
1986	2116	47	38.4	66.0	15.80	2.7	9.3	3.5

Continues…

Appendix 1 Data: continued

	Basic needs		Safety		Belonging		Self-esteem	
	Daily calorie intake	Access to safe water	Infant morality	Life expectancy	Telephone mainlines per '000	Fertility rate	Illiteracy rate	Unemploy-ment
1987	2284	55	37.3	66.2	17.50	2.6	8.9	5.9
1988	2209	66	36.2	67.0	19.10	2.5	8.5	3.1
1989	2316	59	35.1	67.7	21.60	2.4	8.1	1.4
1990	2271	63	34.0	68.5	24.20	2.3	7.6	2.2
1991	2200	65	33.0	69.2	28.10	2.2	7.3	2.7
1992	2443	70	32.0	69.9	32.10	2.1	6.9	1.4
1993	2382	77	31.0	69.6	39.30	2.1	6.6	1.5
1994	2387	86	30.0	69.2	48.30	2.1	6.2	1.3
1995	2305	81	29.0	68.9	60.50	2.0	5.9	1.1
1996	2351	90	28.2	68.6	71.50	2.0	5.6	1.1
1997	2360	91	27.4	68.2	82.10	1.9	5.4	0.9
1998	2322	90	26.6	68.4	84.80	1.9	5.1	3.4
1999	2328	90	25.8	68.6	86.90	1.9	4.8	3.0
2000	2336	89	25.0	68.8	92.25	1.8	4.5	2.4
Vietnam								
1985	2186	19	43.0	62.5	1.20	4.2	10.8	n/a
1986	2244	20	41.6	62.0	1.20	4.1	10.6	n/a
1987	2200	19	40.2	63.4	1.20	4.0	10.3	n/a
1988	2221	20	38.8	61.9	1.20	3.9	10.1	n/a
1989	2233	20	37.4	63.4	1.20	3.8	9.9	n/a
1990	2251	20	36.0	67.7	1.40	3.6	9.7	n/a
1991	2361	24	35.2	66.7	2.00	3.4	9.4	n/a
1992	2250	24	34.4	65.7	2.20	3.3	9.2	n/a
1993	2389	24	33.6	65.2	3.60	3.1	9.0	n/a
1994	2399	35	32.8	65.7	6.00	2.9	8.7	n/a
1995	2437	36	32.0	67.1	10.50	2.7	8.5	n/a
1996	2471	43	31.1	67.6	15.70	2.5	8.3	n/a
1997	2484	43	30.2	68.0	17.40	2.4	8.1	n/a
1998	2422	45	29.3	67.7	22.40	2.4	7.9	n/a
1999	2457	44	28.5	68.0	26.70	2.3	7.7	n/a
2000	2463	45	27.6	69.0	31.85	2.2	7.5	n/a

Source: World Bank (2004).

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