

The Relationship
between
Well-being, Utility and Capacities:
A New Approach to
Social Welfare Measurement
based on
Maslow's Hierarchy of Needs

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Abstract

Though there are several existing approaches to measuring social welfare, a need exists to develop a social welfare approach, which more accurately reflects the hierarchy of human needs (Maslow 1971). This paper empirically applies such a new measure of social welfare to a developing country. In this new approach, social welfare is defined as a function of hierarchical needs fulfillment, allowing traditionally non-welfaristic issues such as justice, liberty, poverty and inequality to be considered. This approach is a distinct alternative to the theories of social welfare based on revealed preferences (Hicks 1940; Pigou 1962), capabilities (Sen 1985) and primary social goods (Rawls 1971). This new measure of social welfare is not dependent on economic growth. It is operational and provides intuitively correct results validated by historical experiences.

1. Introduction

Economic activities are aimed at improving the social welfare of a nation and therefore numerical measures of social welfare have been an important issue of contemporary welfare economies.

Though there are several existing approaches to measuring social welfare, a need exists to develop a social welfare approach, which more accurately reflects the hierarchy of human needs (Maslow 1971). *The limitation of existing literature is that whilst some relative reporting in terms of social welfare in the form of hierarchical needs has been undertaken (Day 1996; Islam and Craven forthcoming; Craven and Islam 2001), the empirical implication of this approach where social choice is used to determine and measure social welfare in terms of Maslow's hierarchical needs has not yet been undertaken.* This paper empirically applies a new measure of social welfare to a developing country. Social welfare is defined as a function of hierarchical needs fulfillment. In developing this new approach, traditionally non-welfaristic issues such as justice, liberty, poverty and inequality are considered. This approach is a distinct alternative to the theories of social welfare based on revealed preferences (Hicks 1940; Pigou 1962), on capabilities (Sen 1985) and primary social goods (Rawls 1971). This new measure of social welfare is not dependent on economic growth. It is operational and provides intuitively correct results validated by historical experiences.

This paper is interested in measuring social welfare in a manner, which until this time has yet to be undertaken. *This paper is interested in measuring social welfare and recognises that there are different concepts of social welfare that have different implications for policy-makers. Within these different concepts, a hierarchical structure is implicit. Relating these concepts to different hierarchical measures of social welfare within specific reference to Maslow's approach has been undertaken.*

By developing the approach of using social choice to determine and measure social welfare in terms of Maslow's hierarchical needs and relating these needs to the different hierarchical concepts of social welfare, *limitations within the current literature have been overcome. Therefore this paper is an important contribution to the current debate.*

Islam (2001a, 2001b) has provided the introductory theory of social welfare measurement based on the *hierarchical need fulfillment approach*. To date, this work has remained limited to a basic theoretical treatment, however this paper substantially extends the theory and empirically applies the hierarchical need fulfillment approach to social welfare to Thailand for a twenty-year period, 1975-1994. It is an extension of Hagerty's (1999) work and a natural progression of Sen (1985) and Rawls (1971).

This approach considers the utility and needs as in utilitarianism, as well as non-welfaristic elements such as freedom, liberty, equity, justice, etc. to provide opportunities for capabilities, as proposed by Sen (1999). Progressive satiation of the needs according to some hierarchy requires the fulfillment of basic needs (that emphasizes rationality and utilitarianism) as well as the satisfaction of higher level needs such as self-actualization (that emphasises functionings, capabilities and freedom, morality, equity, etc.).

This approach is different to a traditional basic needs approach (Streeten 1995) as it moves significantly beyond simple consumption levels to take into account feelings of belonging, safety, belonging and self-actualisation. Fulfillment of these *supra*-basic needs are not necessarily found within the market, can be secured through public policy and within strong social relationships.

Social welfare is ideally determined by the satisfaction of all various levels of need based on human needs. In measuring social welfare, appropriate weights are given to the different level needs from a hierarchy of needs. In this approach, the fulfillment of needs at a higher level could receive higher weight than compared to the fulfillment of lower level needs. Other things remaining equal, if one society has a higher satisfied more population in terms of the maximum number of their higher level needs fulfilled compared to other societies, that society is better off in terms of social welfare. However, different societies may determine that priority should be given to different levels of needs depending the circumstances of the country, thus placing higher weight on fulfilling basic needs and less weight on fulfilling esteem needs. Two different sets of weights will be applied to the data in this paper.

The paper is divided into six sections. This first section has introduced the topic and the issues that will be discussed. These issues are discussed at greater length in the next section. Section Three introduces the concept of social choice theory. Section Four the methodology before the fifth section discusses the findings of this new approach to social welfare measurement based on the fulfillment of hierarchical needs. The final section suggests areas for further study and summarises the paper.

2. Issues

2.1 The Relationship between Well-being, Utility and Capabilities

A major point of controversy in measuring welfare is that a universally acceptable definition of welfare has not been agreed upon (Brekke 1997). Welfare has been defined as a function of consumption (McKenzie 1983; Slesnick 1998), particularly in areas of great poverty (Hueting 1980), as a function of consumption and the environment (Islam

1998), as a function of consumer surplus (Johnson 1996), and as marginal propensity to consume (Islam 2001a, 2001b). Alternatively, welfare is greater than simply consumption (Bonner 1986). Indeed, others have taken the opposing view that welfare is specifically not linked to consumption (Boulding 1949-50; 1992; Sen 1987b) but is rather a function of capital stocks (Daly 1996), or expenditure (Jorgensen 1997), or income (Pearse et al. 1989; Usher 1980; Kakwani 1997a, 1997b), or even the opportunity to consume rather than the consumption itself (Bliss 1993). Reconciliation between such dialectic views seems unlikely.

A significant difficulty is that many terms are used within the literature interchangeably to refer to different concepts (Johnson 1996). This paper holds the position that the terms of *well-being*, *utility*, and *capacities* all describe distinct concepts that fall under the supra-concept of *social welfare*. Further, there is a natural hierarchy within these terms (see Islam and Clarke 2001 for a similar treatment; also see Ackerman et al. 1997; Sen 1985; Williams 1987). Without appreciating these differences, certain indices can ignore relevant information about welfare (Slesnick 2001). Such shortfalls lead to ineffective indicators and misinformed policy decisions (Atkinson et al. 1997). The new approach developed within this paper will measure social welfare using a hierarchical approach based on Maslow (1971) that will link the theoretical and empirical concepts of hierarchy (also see Islam and Craven forthcoming; Craven and Islam 2001).

Within this paper, *well-being* is a narrow economic measure of welfare. Economic well-being refers to one's control over the market and is likened to one's standard of living (Islam and Clarke 2001). Well-being is based on material goods and consumption levels (The Economist 1992; Slesnick 2001). Individual well-being is a function of personal income and calorie intake, whilst society's well-being is a function of national income adjusted for inequality and national calorie intake. This understanding can be defined as:

$$WB = w(Y + C)$$

Where *WB* represents economic well-being, *Y* represents inequality adjusted national income and *C* represents calorie intake.

A higher level of welfare measurement is Utility. Utility differs from economic well-being in that it includes a limited set of non-welfaristic issues. In addition to economic measures considerations such safety and a sense of belonging are included. This understanding can be represented by:

$$U = w(WB + S + B)$$

where *U* represents utility, *S* represents feelings of safety and *B* represents a sense of belonging. It should be noted that these components can be negative, not just positive.

The inclusion of these factors results in a de-linking of welfare from the economic (well-being) and so this new measure of welfare can actually increase or decrease despite constant positive increases in economic growth. It becomes possible therefore, to say that

whilst economic well-being may have increased, utility has been reduced. Both individual and social utility involves more than just increases in income.

Overarching both economic well-being and utility, is capacities (or capabilities - Sen 1985, 1987a, 1987b, 1993). Capacity is the peak concept and includes all well-being (*WB*) and utility issues (*U*) as well as esteem (*E*) and self-actualisation (*SA*) impact on an individual or society's *joie de vivre*. It can be represented by:

$$C = w(WB + U + E + SA)$$

Overarching all of these concepts is social welfare. Each of these component concepts fall under the all-encompassing term of social welfare.

Whether such a concept can be measured by one index is debatable (Slesnick 2001). Perhaps one index is not sufficient and a multi-criteria or multi-attribute function of social welfare is needed (Munda 1998; Drummond et al. 1997). However an indicative measure may be possible using a needs approach (Islam 2001a, 2001b) whereby Maslow's (1971) concept of hierarchy of needs is adapted to measure these various hierarchical concepts.

It is clear that well-being, utility and capacities are distinct concepts and should not be used interchangeably. Utilising these new definitions, this paper will present a new measure of social welfare based on the fulfillment of hierarchical needs.

This new approach seeks to empirically measure social welfare by measuring the success of a country to fulfill a given set of hierarchical needs. Thus linking the theoretical and empirical aspects of hierarchical human needs.

2.2 *Systems Approach to Hierarchical Needs*

The hierarchical needs approach is also a reflection of a systems approach to measuring welfare (Islam and Clarke 2001; Islam, Munasinghe and Clarke 2001). Society is a complex and dynamic state resulting from a number of interconnected and evolving, dynamic systems or domains (Dopfer 1979; Bossel 1999; Colfer and Byron 2001; Slesnick 2001). These systems may include the social, economic, political, environmental and spiritual, which can be represented by an integrated social-economic system (see Islam and Clarke 2000; Islam 2001a, 2001b) or a hierarchical needs SWF. The concentration on only one system to assess, measure and plan social welfare improvements is inadequate.

Various approaches concerned with measuring the concept of social systems have long existed within the literature (see Sengupta and Fox 1969; Islam 2001a, 2001b). These approaches combine various components to build aggregate systems and in terms of development, each of these components affects it in various ways and development is the sum influence of these components.

This new understanding of society as a system is important for those attempting to plan paths to increase social welfare or development. It is evident that a concentration on the importance of GDP or economic growth as a measure of welfare is fraught with danger as GDP is simply the aggregation of one sub-system of many which in total make up society. The inter-relatedness of these sub-systems means that achieving increased economic growth may be obtained at the direct expense of one or more other sub-systems which will feedback not only to future economic consequences but will also have immediate welfaristic consequences for the entire system. By disaggregating the system into hierarchical needs, the relationship between different systems can be better understood in terms of achieving increased levels of social welfare.

2.3 *Welfare Measurement – Subjective versus Objective*

The measurement of social welfare has long been a controversial subject. All measures of welfare are dependent on social value judgements. The use of a social welfare function allows value judgements to be explicitly defined and open to scrutiny. Without a social welfare function, social value judgements can be implicit and hidden. Economists, social scientists and politicians all wish to measure whether individuals or society are better or worse off as a result of economic or social interventions. The ability to accurately predict the effect of such interventions is a powerful tool and keenly sought by all involved.

Practical difficulties in such an exercise are numerous and debate exists as to whether welfare can be measured at all. If individual welfare can be measured, is social welfare simply the sum of its parts or must certain weights and synergies be taken into account? If welfare (individual or social) can be measured, how is it done? Is welfare measured ordinally or cardinally? Can welfare of an individual be measured across time or can the welfare of two individuals (or countries) be compared? Consensus on these issues is rare.

As a social welfare function, value judgements underlie this new measure of welfare based on the fulfillment of a given set of hierarchical needs. The determination of these needs is a subjective, normative exercise. Yet, the data collected on these value judgements is objective, positive data. If a value judgement is made that a certain level of nutrition be consumed daily to attain a specified level of welfare, that is a subjective value judgement. However, scientific data can be drawn upon to objectively determine the daily calorie intake required and objective tools can be used to measure this intake.

Therefore, whilst this new measure of welfare begins as a normative exercise, the calculations made are based on objective, scientific information and data. It is particularly important when measuring social welfare that value judgements (hence subjectivity) are made explicit. Social welfare cannot be judged in isolation of the analyst or society's value judgements (Max-Neef 1991).

3. **A Social Choice Approach to Measuring Social Welfare**

Social choice theory should be applied to social welfare measures as it highlights social preferences and value judgements. It is concerned with economic and non-

economic activities that are important in determining social welfare levels, quality and composition. Social choice theory can highlight changes within society and how these changes impact on social welfare. It transforms subjective measures into objective measures (Clarke and Islam forthcoming).

Social preferences within a society can be represented by hierarchical vector of needs. Such a vector can be aggregated in a hierarchical form. Social choices aim at satisfying the greatest number of wants, starting with the most important and urgent and moving to those less urgent (Georgescu-Roegen 1954). Therefore, social choice theory requires preferences not be aggregated in a scalar fashion, but rather as a vector of hierarchical needs.

Applying social choice theory to measuring social welfare is dependent upon four operations; determining 1) whose welfare is being measured; 2) whether the welfare of the group is different or equal to the sum of welfare of the group's individual members; 3) how distribution of the individual welfare effects the group's welfare; and 4) how to aggregate individual welfare to determine the level of group welfare (Bonner 1986).

3.1 Determining the Group

A new data set for Thailand is presented that fully encapsulates in an index form the five levels of human needs that make up a sophisticated measure of social welfare; basic needs, safety needs, belonging needs, esteem needs and self-actualization needs. This paper focuses on Thailand as a representative developing economy. Thailand has been chosen as it has achieved remarkable growth over the last three decades. This sustained increase in GDP has played a major role in reducing absolute poverty levels, measured in terms of income levels from nearly one third of the population in 1975 to less than ten per cent in 1999 (Warr 2001). But at the same time, income inequality has increased (Clarke 2001).

Whilst certain characteristics of Thailand are not shared by all developing economies, it is considered reasonable that Thailand is seen as a suitable representative economy. It is expected that the democratic social welfare function developed in this paper will be suitable for other developing economies without needing serious adaptation. Whilst Thailand is a unique country, with distinct economic characteristics, it displays enough common traits for it to be a reasonable example of a typical developing country. Furthermore, as Thailand has recently outperformed all other developing (and developed) countries in economic growth rates, there is little doubt that it would be a role model for most of the third world (World Bank 1986; Watkins 1998). This reason therefore bolsters the argument for using Thailand as a representative developing country; if countries are not presently like Thailand, they aspire to be.

3.2 Relationship between Individual and the Group

The objective of social choice is the determination of an intertemporal efficient allocation of resources which maximises a social welfare function that embeds GDP (showing efficiency and rationality), other economic objectives such as full employment, balance of payments etc. (for good macroeconomic and development management) and

indices for equity, justice, rights, liberty and morality (for social welfare) – subject to the given set of resources, information, social structure, legal and institutional or organisational constraints. Within this maximising economy, the aim will be the largest number of the population achieving the highest level of need described by Maslow. This approach is defined in Islam (2001a, 2001b) as the social welfaristic approach to social choice and is in the line of arguments developed by Sen (1999), Roemer (1996) and is discussed in Hausman and McPherson (1996).

3.3 *Welfare Distribution*

The development of a social welfare function addressing the issues of efficient welfare, poverty or inequality measures, theory of justice, liberty and equality is an important contribution in aggregate welfare theory. Such work has been undertaken by Islam (2001a, 2001b) and is extended and applied empirically for the first time in this paper. Islam draws on the work of Maslow (1971). Maslow developed his theory of needs in the late 1960s. He argued human needs are hierarchical in nature and humans strive to reach the highest levels of their needs.

The first group of needs is basic needs and encapsulates some of the traditional *Basic Needs* discussed in development literature (Streeten 1995). 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. (See Hirsch 1995, for a description of the *Paradox of Affluence* where higher income and consumption does not increase social welfare).

The second group is safety needs. These needs are psychological rather than physiological and take the form of home and family. Again attainment of this level of needs is not a function of income. Indeed, from the first level of needs, income levels are specifically not important in increasing social welfare with regards to the hierarchical needs fulfillment.

The third level of needs are 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, esteem needs. Once people belong to groups, they seek to be admired by those around them. Esteem can be brought about through the mastery of skills or the 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. Those experiencing self-actualization cannot be experiencing poverty of any type.

Only hindrances constructed by society stop people reaching the highest level of self-actualization. That is why Maslow can be applied to national welfare measures. This approach can demonstrate whether a society is assisting or hindering its citizens from becoming self-actualized.

Whilst the dominant need is always shifting (a fully self-actualized person will become hungry and tired) they can be generally considered to be hierarchical so that the lowest need must be satisfied before satisfaction of the next level is possible.

If social welfare is defined as a social welfare function, reflecting various hierarchical components, a decision must be made as to the importance of the different components with respect to their impact on social welfare. For example, if social welfare is a function of basic needs and esteem needs, a decision must be made as to their relative importance to that functional relationship. Are esteem needs twice as important as basic needs, or are basic needs twice as important as esteem needs, or are both components equally as important in determining social welfare?

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

The determination of weights is dependent on various value judgements made explicit within the social welfare function. Even when explicit weights are not defined, a value judgement has been made in that all components are equally weighted. This decision is just as much a value judgement 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.

The decision-maker unilaterally sets the weights according to their own value judgements (Dasgupta and Pearce 1971, see Montgomery, Burk and Paredes 1997 as an example). Social welfare can then be defined as:

$$SW = SW (\alpha_1 \cdot S, \alpha_2 \cdot E, \alpha_3 \cdot En)$$

where α_1 , α_2 , α_3 are the set of weights applied to the social (S), economic (E) and the environment (En) respectively. While these weights reflect the value judgements of the decision-maker, they may not necessarily reflect those of society which may have different priorities or needs.

Alternatively, the weights may be set to reflect the marginal rates of taxation. The underlining 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 social welfare 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).

A similar approach, first suggested by Foster (1966), has that the aggregation of social welfare based on individual welfare be weighted by the ratio of the average national income to the individual's income.

$$\alpha_1 = \frac{Y^a}{Y_1} \quad \alpha_2 = \frac{Y^a}{Y_2} \quad \alpha_3 = \frac{Y^a}{Y_3}$$

where Y^a is the average national income and Y_1, Y_2, Y_3 is the income of society's individuals.

Or, 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, p. 27).

A more sophisticated approach is to use factor analysis (Sahn and Stifel 2000) or principal component analysis (Hammer 1988; Filmer and Pritchett 1988) that allows the data itself to determine the weights directly.

A simpler final option may be to determine the set of weights purely on a notion of equity. But equity in this sense is not relative only to income, but may be equity in terms of access to social services, ascetic environments, or satisfactory mental health. This approach takes us back to the first option where the decision-maker unilaterally sets the weights based on certain value judgements. Such an approach certainly relies on value judgements, but if these judgements are made explicit and supported with appropriate data, a set of weights based on this approach is equally as valid to any other suggested previously.

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

Within this paper a value judgement has been made that the appropriate weights should be a linear progression. Two sets of data have been produced. In the first, the value of the highest level of hierarchical needs (self-actualization) will be considered five times as important as basic needs, the second highest level (esteem) will be four times as important, the third level (belongingness) will be three times as important, and the second level of needs (safety) will be twice as important as the first level.

However, the second set has been applied to take into account different levels of development that may impact on weighting decisions.

Different levels of Development

Countries at different levels of development may wish to emphasise the importance of different levels of needs fulfillment or levels of social welfare (well-being, utility and capacities). Whilst the basic nature of the hierarchy of needs will remain unchanged, countries at low levels of development may wish to emphasise the importance of achieving the first two levels of needs (basic needs and safety) rather than that of self-actualisation (the highest level of need). This is a value judgement. Should countries calculate social welfare movements using this new approach, certain policy recommendations can be drawn from the results. If countries are weighting the lower levels of needs highly (or the converse of the above), public policy should be developed to support this achievement. A war-torn country (such as Sudan) would be misguided to focus its public policy of achieving self-actualisation without first focussing on assisting its citizens feel safe through the cessation of the civil war. Likewise, developed countries (such as Australia) would be misguided to emphasise the attainment of basic needs when nearly all citizens can be guaranteed this achievement. Within developed countries, sensible public policies would aim to increase the number of citizens attaining self-actualisation and this success should be highly weighted when measuring social welfare to gain an accurate picture of a country's achievements.

To illustrate this, a second set of calculations will be made whereby weighting the hierarchical needs in reverse order (i.e. Basic Needs will be weighted by 5, safety needs at 4, etc.). Such weighting is a value judgement and recognises that importance of prioritises that all members of society reach the most important level of needs (food, shelter, and water) before concentrating on higher needs such as self-actualisation. A concentration on basic needs is well supported in the literature (Streeten 1995; Moon 1991).

Intergenerational equity

An alternative set of weights may be based on issues of intergenerational equity. If a high level of intergenerational equity is preferred by society, greater weight will be given to the achievement of those indicators that do not reduce exhaustible resources. Generally within this new approach, social welfare is not dependent on the consumption of resources (other than the achievement of the most basic of needs – which can occur with low levels of consumption), but rather the development of the “human spirit”. The attainment of higher levels needs can occur at very low levels of resource use, thus maintaining levels of natural resources.

It is important to note that these weights are tentative and more work is required. The two estimates produced in this paper reflect 2 different sets of priorities that may be selected by policy-makers. The results will be discussed in Section 5.

3.4 Aggregation

Having decided weighting (primarily through justified value judgements), how should the many different indicators measuring attainment of Maslow's hierarchy of needs be aggregated? How does one add calories per year and personal income per capita? A common denominator must be found.

A Borda index for each indicator can be calculated and these figures then added. Within this Borda Index, the higher the number, the better the result i.e. the year with the highest GDP calories or personal income per capita will have the highest ranked Borda number. Therefore, in terms of aggregation, the year with the highest result will be the year with the highest level of social welfare.

Alternatively, a *normalised* index for each component can be calculated in order to find a common demoninator. A *normalised* 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).

Whilst the indicators across all levels of needs may be substantially higher in "rich" developed countries, the measurement of social welfare will not necessarily be higher in these countries than in countries with lower indicators. This is because social welfare 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 social welfare 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 can be considered a significant flaw in the calculation of the index of social welfare based on the fulfillment of hierarchical needs. It appears to reward countries with low starting points and penalises countries that are already developed (such a developed country may wish to alter the selection of weights being used as previously discussed). 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). 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, p. 3; also see Pusey 1998; Brekke 1997; Travers and Richardson 1993; Ng 2001 provides an extensive review of this literature). Equilibrium will soon return and peoples' levels of satisfaction will subsequently fall.

As humans adapt to their current situations, welfare can only increase if there are constant improvements in their circumstances. This new index measures changes in welfare based, not on achieving high levels of success, but by increasingly satisfying certain human needs. This is sustainable development or the movement from one social state to a higher social state.

It may be that social welfare within "rich" countries 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 welfare. As discussed, using different weights to

emphasis the importance of the different levels of needs and different levels within social welfare may partially overcome such a cap. Though it is reasonable to believe that at some point all of Maslow's needs will be satiated. This will result in social welfare no longer being able to increase and perhaps the establishment of a steady or stationary state (see Daly 1991).

The *normalised* approach has been adopted for this study.

4. Methodology of Fulfillment of Hierarchical Needs Social Welfare Function

This approach is operational and its intuitively correct and historically validated measures of society's welfare are an important contribution to society's welfare literature.

Using Maslow's theory of hierarchical needs, Hagerty (1999) has shown that the development path of nations or general economic development follows a S-shape pattern. Lower level basic needs are achieved during the early stages of economic development, whilst higher level needs are achieved only when the economy has progressed sufficiently in terms of real income per capita. In terms of development strategies, an emphasis may be given to the fulfillment of lower level basic needs at the initial stages of economic development, while the emphasis may shift towards the provision of the satisfaction of higher level needs as the economy progresses over time and reaches a higher level of income.

Hagerty's (1999) work describes the experience of 88 countries over a 35-year period, 1960-1994. The results are in line with Rostow's (1971) stages of growth theory. Hagerty finds that in general, most countries have developed in a S-shape closely following Maslow's predictions that human needs are hierarchical. The implication for nations is that basic needs must be achieved before higher needs such as self-actualisation can be realised.

The present approach does not seek to use Maslow to predict patterns of economic development. Rather, this paper seeks to draw on Maslow's description of needs to measure social welfare. Rather than predicting paths of development, this paper is interested in measuring social welfare in a manner, which until this time has yet to be undertaken. It is an extension of Hagerty's (1999) work and a natural progression of Sen (1987a, 1987b) and Rawls (1971).

Maslow's hierarchy of needs can be operationalised if the five categories of needs can be numerically measured. Hagerty (1999) has proposed a number of indicators that form the basis for this new measure. Whilst these suggested indicators are based on value judgements and alternatives could be clearly argued for, these indicators are a suitable starting point. Future work may wish to expand and introduce new alternative indicators, however, the present work is sufficient for this paper.

Physiological

- Daily calories available per person

- Personal income per capita adjusted for inequality

Safety

- Safety from murder
- High life expectancy

Belongingness

- Low divorce rate
- Low child death rate

Esteem

- Political and civil freedom
- Women's participation in work for pay

Self actualisation

- Secondary education enrollment rate
- Primary education enrollment rate

The social welfare function being proposed in this thesis is:

$$SWF_t = \frac{\sum SWF_t(\alpha_1 \cdot BN_t, \alpha_2 \cdot SN_t, \alpha_3 \cdot BLN_t, \alpha_4 \cdot EN_t, \alpha_5 \cdot SA_t)}{(1 + r)^t}$$

where: SWF is social welfare function
 BN are basic needs
 SN are safety needs
 BLN are belonging needs
 EN are esteem needs
 SA is self actualization
 $\alpha_1, \dots, \alpha_5$ are the weights assigned to each set of needs
 r is the discount rate
 t is time

4.1 Basic Needs

Significant literature exists regarding the identification of basic needs (see Streeten 1995 for a summary of the issues surrounding this area), however, as with much of welfare economics, little common agreement exists as to the best way of measuring this concept.

Two measures have been chosen as indicators for this first level of need; calories per person and personal income per capita. Other measures that would have been suitable include indicators measuring air pollution and access to clean water. Through various household surveys and national accounts, accurate measures of the two selected indicators can be found. Both were chosen in part for their ease of measurement, but also because they encapsulate what Maslow was seeking to describe.

Along with water and sleep, food is the most basic of human requirements. Without sufficient food or sufficient quality, survival is not possible. By measuring calories per person, an accurate understanding of the improvements not only in access to but also quality of food over time is gained.

Personal income per capita adjusted for inequality (Atkinson 1971; Clarke 2001) is a suitable indicator for the control one has over the market. Many basic needs cannot be directly purchased (there is no market for clean air), however income levels do provide some indication as to the ability to access many of the basic needs; water, shelter, clothing, etc. Money cannot buy love (which is why this is not an indicator of higher needs), but it can reasonably purchase most basic needs.

As discussed the attainment of higher levels of Maslow's hierarchy is not predicated upon high-income levels. As with Sen's (1985) capabilities, income plays only a small role in predicating social welfare levels.

4.2 *Safety*

Having attained the lowest level of needs required, attention would focus on achieving a feeling of safety. Two indicators of safety have been chosen to measure the success of Thailand in this regard; safety from murder and life expectancy.

A constant threat to one's safety can be measured by a country's homicide rate. The safety from being murdered is a fair indicator as to how a society is succeeding in ensuring its members achieve increasing levels of social welfare. This data is reported within official Thai government National Statistical Office (NSO) quarterly and monthly bulletins.

Another suitable indicator for this success is the general life expectancy. Whilst there are crossovers with regard to the fulfillment of basic needs, a high life expectancy is also a reasonable measure of how safe one's life is. Premature death is caused not only by war and murder, but is also caused by accidents. Again, this data is reported within official Thai government National Statistical Office (NSO) quarterly and monthly bulletins.

4.3 *Belonging*

The relationship one has with one's own family is often rated highly as a factor of self-reported happiness. An important aspect of belonging is to belong to a family. Measuring divorce rates is partially successful in measuring the rate of which people feel part of a functioning family. Data on this indicator is again reported within official Thai government NSO quarterly and monthly bulletins.

Measures of "belongingness" and love were related to the risk of a "broken family" – the risk of divorce, as well as the risk of a child in the family dying. Many parents report that the death of their child is the greatest suffering a parent can endure. Similarly, divorce causes great stress and suffering for the entire family. (Hagerty 1999, p. 254)

4.4 *Esteem*

Having attained the first three levels necessary for measuring social welfare, a sense of esteem is the next hierarchical need. The level of political and civil freedom and women's participation in the paid workforce have been chosen as suitable indicators. Both of these indicators measure how advanced society is in ensuring its members are not feeling disenfranchised from the political and economic systems. This data was based on official Thai government NSO publications and the Freedom House time series on political and civil freedoms (Freedom House 2001).

4.5 *Self-actualisation*

The highest level of needs that can be attained is self-actualisation, or more clumsily, being the person you were born to be. As with the other levels of need, a simple indicator of this level of need is not straightforward. Primary and secondary education enrollment rates have been chosen as it is felt that education is a reasonable measure of people's ability to better themselves. Whilst education does not guarantee in itself improved employment, etc, it does provide the opportunity for people to become informed and make decisions concerning their own lives.

Again, it is important to note that the attainment of self-actualisation is not based on income levels. By separating the highest level of Maslow's hierarchy from personal income, it is possible that social welfare in developing countries may rate as high as that of developed countries with far higher national income levels.

The data for all these indicators has been gained from the cited sources (see Appendix A). Where complete time series data are unavailable, trend lines have been estimated to cover these small gaps.

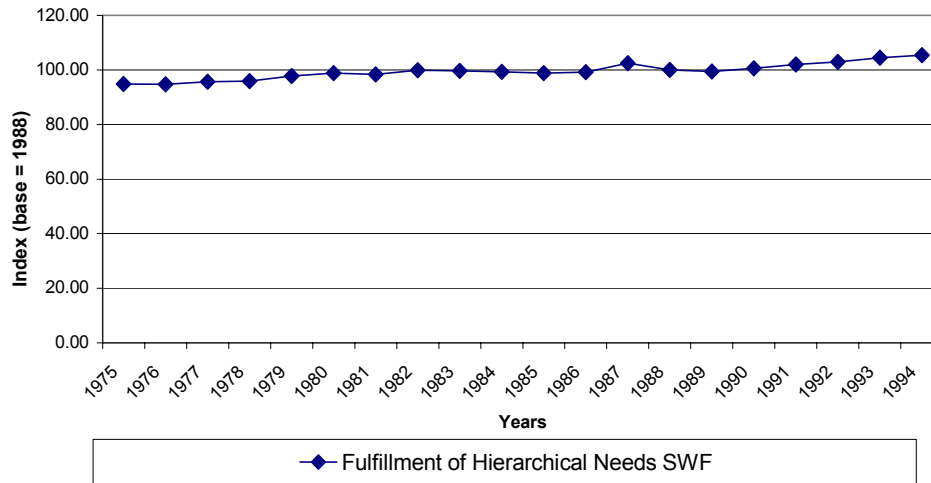
5. *Findings*

As this new fulfillment of hierarchical needs SWF is based on various 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 such as GDP or adjusted GDP (Islam and Clarke 2000, 2001, forthcoming) do not provide such information.

As discussed, two sets of weights have been applied to the data. In the first set, the weights are assigned so that greater importance is given to attaining the highest level of need (self-actualisation). In the second, the greatest weight is given to ensure that priority is assigned to the most fundamental of needs (basic needs).

Within the first set of weights, the social welfare increase is quite flat throughout the two decades under review. This would suggest that social welfare was quite steady throughout most of these two decades with only small rises and falls.

Figure 1 Fulfillment of Hierarchical Needs SWF

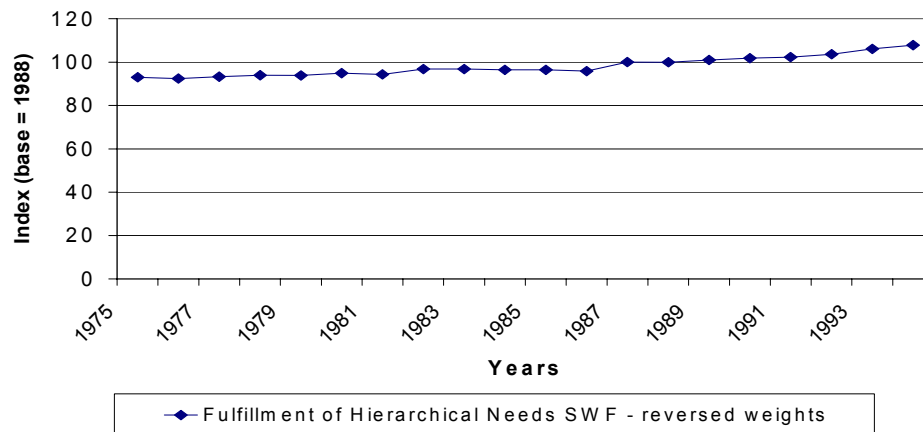


Source: Authors' estimates

For most of the 1980s, the social welfare index did not rise at all, suggesting that this period of unprecedented economic growth did not assist the Thai population's attainment of Maslow's hierarchy needs.

Interestingly, the pattern of social welfare growth was virtually unchanged when the weights were reversed (see Figure 2). This may be explained that again unprecedented economic growth has not impacted on the two most fundamental needs (basic and safety) as these can be reached with relatively low levels of national income. It may be expected that a poorer country than Thailand might have significantly different results. It might also suggest that a sufficient level of basic needs attainment has been reached in these areas and greater concentration can now be given to the next level of needs (such as Belonging and Esteem needs). This seems intuitively correct as Thailand is now considered a middle-income country based on GDP per capita figures (World Bank 2000).

Figure 2 Fulfillment of Hierarchical Needs SWF (reversed weights)



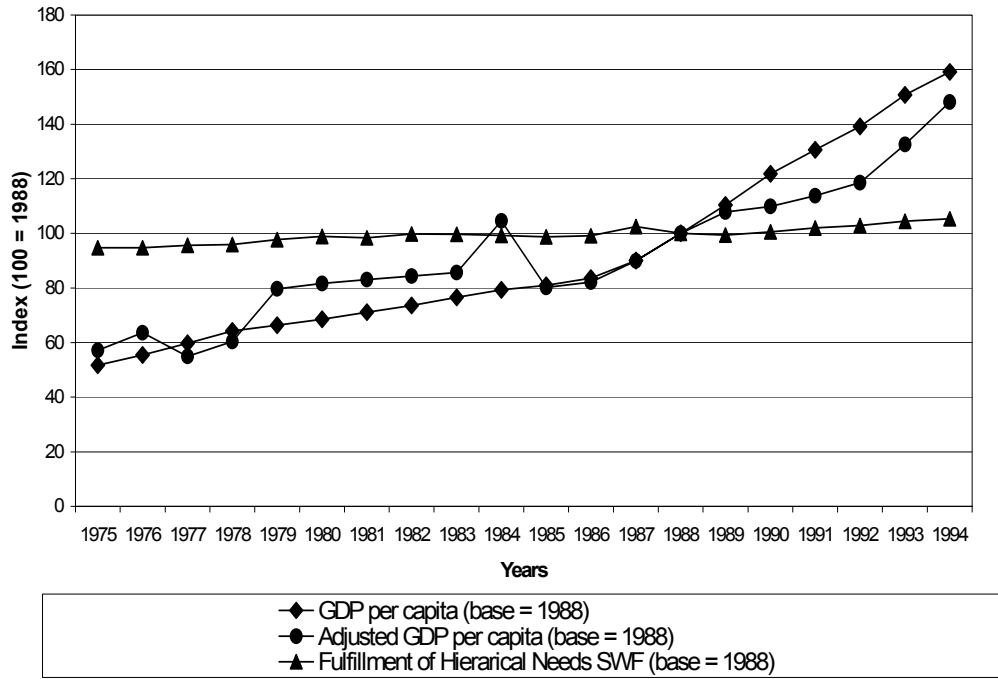
Source: Authors' estimates

The lack of impact of economic growth on social welfare is more clearly shown in Figure 3. Over a eight-year period, the social welfare index did not have an overall increase. The position in 1989 is the same as it was nearly a decade before in 1982.

Compared to the large increases in social welfare as measured by GDP per capita and adjusted GDP, the rise in social welfare as measured by the fulfillment of hierarchical needs is quite modest. This seems to be intuitively correct. Furthermore, it seems that rapid increases in economic growth have had little or no effect on increases in social welfare as measured by the SWF developed in this paper. During years of constant and high levels of economic growth, social welfare actually rose and fell independently of these constant increases. If social welfare is able to fall or remain unchanged during periods of economic growth, such growth must have little impact on social welfare.

There are three main advantages to this new measure of social welfare based on the fulfillment of hierarchical needs compared with GDP or adjusted GDP measures of social welfare. Firstly, it provides an intuitively more correct measure of social welfare than GDP per capita. Secondly, it provides insights into the structure of society and how society is assisting its members achieve various needs. Thirdly, it provides policy implications. Recently, some attention has focussed on Maslow's (1971) hierarchy of needs and the appropriateness of this theory for formulating public policies (Hagerty 1999; Sirgy 1986). Hagerty (1999) has shown that economic development for nations generally follows an S-shape in terms of Maslow's hierarchy of needs. This work adds to various other theories predicting stages of development (see Rostow 1971).

Figure 3 Comparison of Various Measures of Social Welfare for Thailand



Source: GDP and Adjusted GDP calculations adapted from Islam and Clarke 2001, Fulfillment of Hierarchical Needs authors' estimates

By incorporating social choice theory, systems analysis and hierarchical needs, this new approach is therefore a very effective measure of social welfare. It is a significant contribution to the literature as the development of a new methodology that is operational and provides intuitively correct results.

Just as there is a hierarchy with social welfare, there is a hierarchy within this measure. This allows a disaggregated review of the results (though this has not been undertaken within this paper) which allows policy makers to determine the success of a society to attain various levels social welfare (well-being, utility, capacities).

By using a systems analysis approach, it can be seen that the various systems within Thailand have also changed overtime (see Figure 4). By disaggregating this new measure of social welfare based on the fulfillment of hierarchical needs, it is possible to view how the structure of the vector of needs that impact on social welfare have changed, and thus changing the total system, over time.

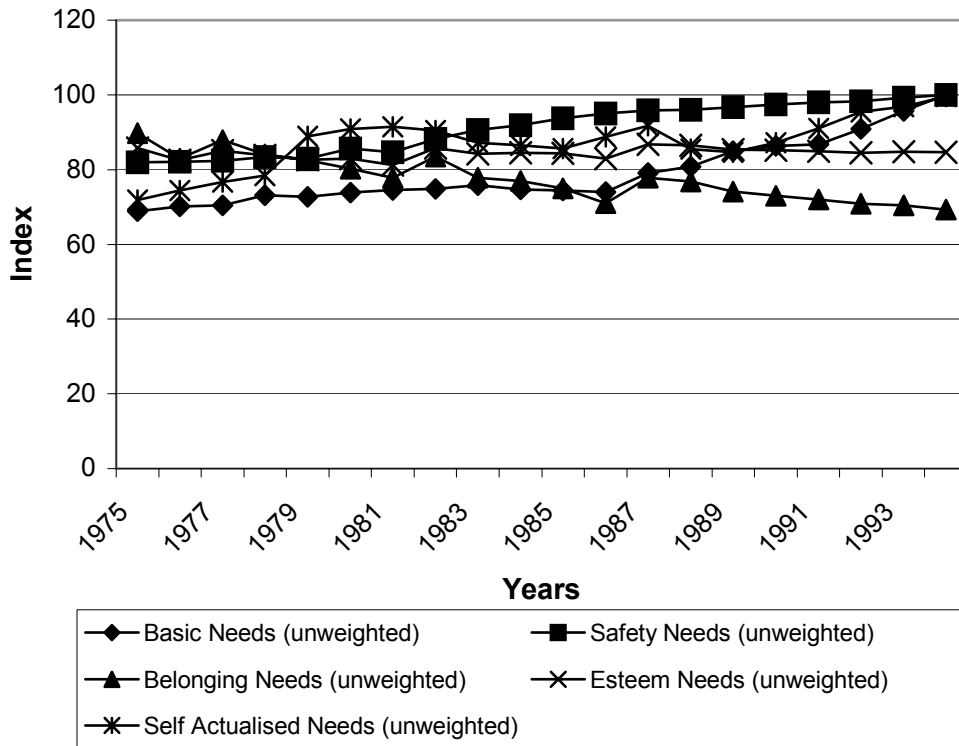
Figure 4 shows the disaggregated hierarchical needs (unweighted) during this time period. It highlights that Basic and Safety needs have improved over time whereas, the sense of Belongingness has fallen during the same period. Esteem needs remain quite static over the period whilst Self-actualisation has improved overall during the period under study but a closer examination reveals a numbers of falls and rises over this period.

The significance of being able to disaggregate this new hierarchical measure of social welfare is two-fold. First of all, it allows policy-makers to view society as a system and understand how different policies can impact on those different systems. Secondly, and closely related, it allows a greater understanding of the hierarchical nature of both human needs but also how these needs are linked to a hierarchical understanding of different concepts within social welfare.

These results reflect the historical conditions experienced by Thailand during this time. Economic growth has been dramatic therefore increasing incomes and calorie intake. The fall in Belongingness may reflect the effect of liberalisation and globalisation of social values experienced by Thais over the period. Whilst infant mortality rates have substantially reduced, it has been more than offset by even higher levels of divorce rates resulting in increased family breakdown. Of course, the choice of indicators is an important determinant in this analysis and alternative indicators could be chosen.

As these movements in the hierarchical concepts of social welfare and hierarchical need reflect historical experiences it is possible to say that these results have been strongly validated.

Figure 4 Disaggregated Hierarchical Needs (unweighted)



Source: Authors' estimates

6. Conclusions

An area worthy of future study is whether alternative paths of development can be achieved whereby human needs are not fulfilled in sequence but are fulfilled simultaneously. Max-Neef (1991) proposes a non-hierarchical matrix of needs and satisfiers. The nine suggested “axiological categories” of human needs are fundamental to human evolution and are constant across all cultures. These needs are: Subsistence, Protection, Affection, Understanding, Participation, Idleness, Creation, Identity and Freedom. These needs are achieved through what Max-Neef coins “satisfiers”. Satisfiers change according to each culture and even differ within those cultures. Satisfiers can be distinguished into four “existential categories”; Being, Doing, Having and Interacting. Empirical application of this approach is difficult, but progress is being made (Choudhury 2000).

The apparent significant difference between Maslow and Max-Neef is Maslow’s condition of hierarchy. Max-Neef’s needs set are non-hierarchical and so any number of unmet needs (termed *poverties* by Max-Neef) can simultaneously exist. This divergence can be bridged however. Maslow notes that the dominant need is always shifting so that a

self-actualised person does become hungry and tired and this basic need becomes the priority. The implication of this shifting dominated need (Maslow 1971) or non-hierarchy of needs (Max-Neef 1991) is that policies aimed at maximising social welfare must be more sophisticated than simply trying to achieve economic growth. Developing a social welfare function on Maslow's approach to hierarchical need fulfillment encourages this outcome.

The approach developed in this paper is different to previous approaches using Maslow's hierarchy of needs (Hagerty 1999) as it is not an attempt to predict movements in quality of life or development (in a similar vein to Rostow's (1971) stages of growth theory), but rather it is an approach to measure welfare. Measuring welfare is essentially an empirical exercise and so this approach is empirical in nature.

Within this calculation, the attainment of these needs for the entire society is considered. An alternative approach may be to measure the success of a society by the attainment of these hierarchical needs by a low-income section of that society. The new measure of social welfare presented in this paper overcomes this paradox by not linking increases of social welfare with economic growth. Indeed, countries can increase their social welfare without increasing economic growth or even during times of decreasing economic growth (conversely, social welfare can fall despite increases in economic growth). Social welfare is dependent on fulfilling a given set of hierarchical needs and the role of the state should be to support this attainment. As various levels of human need are attained, higher concepts of social welfare (well-being, utility and capacities) are also attained. Therefore not only can societies aim to increase total social welfare, they can also aim to improve their performance in the hierarchy of social welfare concepts.

As Sen (see for example 1999) has stated repeatedly, social choice theory is concerned with the normative assessment of economic states and outcomes. The present paper has applied social choice theory to a hierarchical needs based welfare measurement of social welfare in Thailand. This approach has been innovative and appropriate since it has produced plausible estimates of social welfare in the Thai economy and has provided useful information and insights into processes and changes in development dynamics in Thailand and the normative implications of these. The adoption of the systems approach has also been useful since this adoption has assisted in identifying, quantifying and measuring the various hierarchical needs that contain the elements of social welfare both systematically and rigorously.

Appendix A

Individual Indicators to Measure Hierarchical Needs Fulfillment, Thailand 1975-1994										
	Basic Needs		Safety Needs		Belongingness Needs		Esteem Needs		Self-Actualisation Needs	
Year	Calories	Inequality adjusted Personal Income p.c. (1988 baht)	Homicide rate	Life Expectancy	Divorce rate	Infant Mortality	Democracy	Female Workforce	Prim. Enroll	Sec Enroll
1975	2250.00	8113	28	60.60	30	26.00	8	47.76	81.00	25.0
1976	2240.00	8661	28	60.90	40	25.50	5	47.68	81.00	27.0
1977	2188.00	9150	28	61.20	40	16.20	12	47.60	83.00	28.0
1978	2235.00	9792	27.16	61.95	45	16.60	11	47.52	84.00	29.0
1979	2205.00	9887	28.92	62.70	49	14.20	10	47.43	95.00	29.0
1980	2226.00	10149	24.94	63.45	53	13.30	7	47.35	99.00	29.0
1981	2224.00	10400	27.56	64.20	57	12.50	7	47.29	100.00	29.0
1982	2211.00	10604	22.17	64.94	49	12.40	7	47.22	98.00	29.0
1983	2245.00	10745	18.26	65.45	57	12.40	7	47.15	99.00	30.0
1984	2190.00	10728	16.56	65.96	59	11.30	7	47.09	97.50	30.0
1985	2178.00	10733	13.84	66.47	62	11.00	7	47.02	96.00	30.0
1986	2160.00	10685	12.27	66.98	69	9.00	7	46.95	97.00	32.0
1987	2284.00	11632	11.29	67.49	58	11.00	6	46.88	98.00	34.0
1988	2209.00	12860	11.27	67.79	61	9.00	6	46.82	98.00	29.0
1989	2282.00	13813	10.40	68.09	66	8.00	6	46.75	99.00	28.0
1990	2259.00	14509	9.53	68.38	67	8.00	5	46.69	99.00	30.0
1991	2200.00	15148	8.85	68.68	68	8.00	5	46.75	99.00	33.0
1992	2326.00	15699	8.85	68.98	70	8.00	10	46.81	98.00	37.0
1993	2382.00	17043	8.61	70.19	71	7.00	7	46.87	99.00	37.7
1994	2387.00	18614	7.79	70.70	73	7.00	8	46.93	99.00	39.8

Source: Compiled from Hagerty (1999); Clarke 2001; various NSO publications; Freedom House 2001.

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