Comparative Human Development: Egypt, Middle East, and the Developing World

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Abstract

The objective of this research is to derive a comparative human development index by which to study the social welfare position of the Egyptian economy relative to the Middle East region and developing countries. This includes a comprehensive set of economic development indicators: per-capita income, poverty ratio, poverty gap, inequality of income, inequality of gender, and multiple dimensions of social entitlements as inverse measure of social deprivation. Taking water access, health access, education enrolment, and life expectancy as social entitlements, a new human development index is derived based on different works in the literature, most notably the works of Bergson, Samuelson, Atkinson, and Sen. This formulation is then applied to the Egyptian economy, the MENA region, and to a regional set of 79 developing countries. This gives rise to achievements, constraints, and future challenges on a comparative scale.

1. Introduction: The Importance of Human Development in an Economy

Human welfare is the status reflection of a country's economic policies, resource endowments, income distribution, and gender participation. Human development thus reflects the social welfare position of an economy given historical performance. There are several dimensions to the measurement of human development in the literature of which the most important can be grouped into the following categories: (1) income, (2) livelihood, (3) gender, and (4) education (Bergson 1938, Atkinson 1970, Tinbergen 1975, Kakwani 1980, Sen 1987, and Nelson 2005).

Income-measures of human development incorporate the importance of purchasing power parity as a comparative power of consumption for a set of necessary consumer goods ('basket of consumption necessities'). Therefore, if the equivalent of $1,000 of purchasing power parity (PPP) income spent in Egypt can purchase X bundles of goods, then in order to adjust for relative prices, subsidies, and exchange rate misalignments, those $1,000 are said to be the equivalent of, say, $4,000 in terms of world prices if those same X bundles of goods are purchased in the United States in dollar payments of $4,000. Further, if the marginal propensity to consumer (*mpc*) is set fixed across countries in terms of consumption necessities, then the PPP becomes a true indicator of consumption disparities across countries, and hence, a partial indicator of relative social welfare status of economies. In addition to PPP calculations, additional income-measures of human development include aspects of poverty and inequality which are to be discussed later.

Livelihood-measures, on the other hand, are non-income measures of human development and generally encompass access to a clean water supply, access to a reliable health service, and an indicator for mortality and life expectancy. Thus, livelihood implies the degree of social mobility (rather than income mobility) in an economy in terms of non-material wants in life (Dasgupta 2001). They measure life necessities in terms of non-physical consumption. Such consumption of non-physical wants is especially severe the poorer a given economy becomes. In other words, there is diminishing marginal utility of social mobility as economies develop through time. Social mobility, however, can be argued to create

more resonance to the well being of societies than pure material wants when a sufficient amount of generational time is considered. In general, livelihood constitutes a subset of social entitlements in which the citizen is entitled to a set of non-material necessities, yet such entitlements would then differ across countries due to differential functionings and divergent capabilities between societies.

Overall, both livelihood and income measures determine the physical and non-physical necessities required in the life of an average citizen. Consequently, the relative endowment of those necessities determines the level of social welfare in an economy.

Yet, there are two other human dimensions of importance to development: that of gender and that of education. The 'gender dimension' and the 'education dimension' are seen in this research as social entitlements to a decent standard of living and equal opportunity. In other words, there should be no discrimination on the basis of gender in pay, in employment, in political participation, and in civil work entitlement. On the other hand, every citizen (male or female) is entitled to be literate in reading and writing his own language, and to engage in educational attainment of schooling. These dimensions encompass 'entitlements' to social welfare and create the needed momentum for the attainment of a more affluent society.

In general, those 'necessities' and 'entitlements' generate a certain level of social welfare for a given economy: (1) income as a welfare measure of physical necessities, (2) livelihood as a welfare measure of non-physical necessities, (3) gender development as an entitlement dimension regarding equal opportunity for all, and (4) education as an entitlement for literacy and development of primary skills.

2. Human Development Literature: Atkinson, Bergson, Samuelson, and Amartya Sen

Human development is a reflection of the social welfare status in an economy. The *MIT Dictionary of Modern Economics* defines social welfare as "the well being of the society or community at large" such that a social welfare function is defined to be a representative function "which reflects society's objectives and the positive and ill effects in which resources are allocated". One of the early pioneers along the lines of this thought is Bernoulli in which he proposed a "diminishing social utility of wealth" based on St. Petersburg's paradox, and the idea was later articulated by Atkinson's marginal utility of income in measuring relative income levels of economies. Atkinson devised a measure of purchasing power parity based on adjusted income as the efficiency criterion in social welfare (Atkinson 1970). His welfare function is given by:

$$W(y) = y^* + 2y^{*\frac{1}{2}} + 3y^{*\frac{1}{2}} + \ldots\ldots$$
$$+ (n-1) y^{*\frac{1}{n-1}} + n\left[y - (n-1) y^* \right]^{\frac{1}{n}}$$

where y* is world average income.

Atkinson's concave welfare representation of adjusted income reflects Bernoulli's diminishing social utility of wealth in the sense of two directions: First, welfare increases proportionally to income, but such a proportional increase diminishes with wealth accumulation. Second, any country's income level can be compared to the world average based on purchasing power parity such that exchange rate fluctuations are accommodated in cross-country comparisons.

Samuelson, on the other hand, utilizes Bergson's social axioms and proposes an additive (weighted average) social utility based on the utility levels of different segments of the population. Hence, for $i=1$ to H households in an economy, the social welfare of the community is given simply as:

$$W = W (U^1, U^2, ..., U^H)$$

Such a simplification abstains from being comprehensive. Although both efficiency and distribution effects are claimed to be implicitly represented in such a formulation, cardinal versus ordinal approaches of measuring utility of households would produce differing results. Incidentally, all household utilities must be homogeneous in income levels and aggregate social welfare should be homothetic. Since preferences differ across countries, in addition to differences in income, Samuelson's weighted average utility becomes limited in its conceptualization of human development across economies.

Amartya Sen lately proposes an "Entitlements" or "Functioning" approach to the measurement of social welfare from a human development perspective (Sen 1977, Sen 1997, and Sen 1999). Three dimensions are apparent: efficiency, distribution, and poverty. More precisely, mean income, income inequality, and depth of poverty are explicitly formulated in social welfare as follows:

$$W = W(Y,G,P) = W\left(\sum_{i=1}^{N} Y_N \Big| Y_N < Z, G_Y, P(P_0, \overline{Y}_N, Z) \right)$$

where (Y, G, P) denote income, inequality, and poverty respectively for N poor people in the economy, Z being the poverty line (taken from UNDP's \$2 a day cutoff poverty line), G_Y is the Gini index from the Lorenz curve distribution of income in the population, P_0 is the poverty ratio (head counts of the poor relative to population), and $\overline{Y}_N$ is the average income *of the poor*. Sen's welfare formulation thus incorporates an income-measure approach to human development, and further elaboration of this index to include non-income measures (such as livelihood, education, and gender) would produce the desired result of a comprehensive social welfare function representing human development in an economy.

Atkinson's purchasing power parity formulation should be integrated with Bergson-Samuelson social utility within the framework of Amartya Sen just described. Then, such a social welfare formulation of human development can be applied to Egypt, the MENA region, other regions, and to the developing world. Egypt's relative position to the world economy can then be assessed based on a comprehensive human development formulation, thus giving rise to policy implications and general recommendations for reform.

3. Methodology

It has been mentioned that the main objective of this research is to study the social welfare position of the Egyptian economy relative to the Middle East region and to the developing world, based on a post-Sen welfare function assessment which includes a comprehensive set of economic development indicators. Social welfare evaluation of a typical economy encompasses different economic development performance elements, such as per-capita income, the poverty ratio, the poverty gap, inequality of income, inequality of gender, and a set of social entitlements. Taking access to water, access to health, education, and life expectancy as the set of social entitlements, a social welfare evaluation of the Egyptian economy is proposed with the inclusion of Atkinson's purchasing-power of income formula which generates diminishing marginal utility of income. In addition, total expenditures needed to eradicate poverty are formulated as a function of the poverty ratio and the poverty gap. Aversion to income

inequality and aversion to gender inequality are also included.

Such a methodology is seen as a comprehensive welfare assessment of a typical economy based on different works in the literature, most notably the works of Bergson, Samuelson, Atkinson, and Amartya Sen.

The social welfare function is proposed as:

$$SWF = \left\langle \left(\mu(Y) - P(P_0, P_1, z) \right) \left(1 - G_Y \right) \left(G_g \right) F(S_D)^{-1} \right\rangle$$

where

a) $\mu(Y)$ is the adjusted per-capita income using Atkinson's formula;

b) P is total expenditures needed to eradicate poverty, which depends on the head-count ratio P_o, the poverty gap P_1, and the poverty line z;

c) G_Y is the Gini index for income inequality;

d) G_g is a composite index to reflect aversion to gender inequality;

e) $f(S_D)$ is a vector of social deprivation (an inverse of livelihood and social entitlements) which includes access to water, access to health, education attainment, and life expectancy.

The characteristics of this social welfare formulation are numerous. First, it is a direct extension of Sen's formulation yet in addition includes *non-income* social entitlements such as livelihood, gender, and education. This is explicitly formulated as a vector of variables in the $f(S_D)$ sub-function above. Second, such a social welfare formulation includes Bernoulli's *diminishing social utility of wealth* by the adjustment in Atkinson's formula, which is given by $\mu(Y)$. This adjustment makes sure that the level of human development is not just a linear extension of income, but rather measures utility of wealth as a sub-dimension of social welfare. Third, $P(P_0, P_1, z)$ is a measure of the *total expenditures needed to eradicate poverty* which is dependent on poverty count, poverty gap (depth of poverty), and is sensitive to a given cut-off poverty line. It has a negative connotation to social welfare since more resources needed to eradicate poverty implies a lesser level of human development historically attained. Fourth, *inequality in human development* has two core dimensions: inequality of gender G_g and inequality of income G_Y, both of equal importance to human development. Hence, equal opportunity and equal income entitlements are seen as the benchmarks to which actual performance deviates. Fifth, *'social deprivation'* is reflected as an inverse measure of human development giving rise to $F(S_D)^{-1}$. Such a methodology measures social losses by lack of entitlements as the mirror image of social welfare gains to their access. Entitlements include dimensions of water, health, life expectancy, education, and illiteracy. Finally, the general social welfare formulation is given using a Cobb-Douglas style *multiplicative* formulation (in contrast to Samuelson's additive function) such that the relative sensitivity of each variable to human development can be feasibly evaluated.

4. Comparative Human Development: Egypt's Relative Performance to Africa, Middle East, Asia Pacific, Latin America, and Eastern Europe

Based on the above social welfare formulation of human development, the relative performance of Egypt as a developing country is investigated. Applying the above human development methodology to the world economy made it possible to segment the world into different regions: Middle East (MENA),

Africa, Asia/Pacific, Latin America, and Europe (Eastern). Data sources include UNDP Human Development Reports, World Bank's World Development Reports, Social Indicators for Development, International Historical Statistics, Egypt's CAPMAS, and Egypt Human Development Reports. Although a dynamic analysis cannot be claimed, data is generally taken from 1997-2003 for most countries. Variables used are poverty (head count of poor living under UNDP's $2/day relative to population), poverty gap (percentage of deviation of the average poor person from the $2/day poverty line), poverty expenditures ($ per person per year), per capita PPP income level of the economy (PPP GDP $ per capita), gender (gender development index including aversion to wage and education), income inequality (using the Gini index of income inequality from Lorenz curve income distribution), water & health access (percentage of people who have access to a clean water supply and a reliable health source), life expectancy (in years), and finally, education and illiteracy (percentage of enrolment to those eligible).

Looking at the results, it is found that Egypt's relative position in terms of poverty is rather adequate compared to the world average but inadequate as compared to the MENA region. There are 43.90% of people living under the UNDP's $2 a day poverty line in Egypt, as compared to 42.10% of the world average and 19.19% in the MENA region. This means that Egypt's policy performance in terms of poverty is in line to world standard but not in line with its regional partners. Consequently, regional culture is not a causal factor to poverty as some may claim. On the other hand, Egypt's poverty gap is a mere 11% from the poverty line. This implies that the average poor person has his income livelihood 11% below the international poverty line. This is quite impressive compared to the world average (20% poverty gap) and also superior to most regional performance measures (35% poverty gap in Africa, 16% in Asia/Pacific, and 15% in Latin America). Hence, although the number of poor in Egypt is large as compared to its region, the severity of the poor is not deep as compared to international measures. Egypt's poor can be characterized by "hunger-free poverty" as compared to other regions of the world. This can be due to the current social contract between citizen and state in terms of food subsidies in addition to the informal contract between citizen and citizen in the form of religious donations of *Zakat* money and church distributions.

To lift a poor person out of poverty, the Egyptian society requires a correction equivalent to $83 per person per year as additional income or its equivalent supply of food consumption. This is almost half that of the world average but almost double that of its region. This means that the economic resources required to totally eradicate poverty in Egypt is half that required on average in the developing world. In absolute terms, total expenditures needed to eradicate poverty in Egypt are equivalent to approximately $2.5 billion (1.03% of total GDP or 2.3% of adjusted per capita GDP based on active labor force).

Output productivity is $3520 per capita per year which is one third below the world average of $4727. This is disappointing and particularly important as the contribution of output productivity to social welfare as an efficiency criterion to human development is evident. Hence, Egypt must increase its output productivity as the mirror image of resource efficiency *by at least one third* in order to cope with the world standard. In relative terms, Egypt's productivity fairs little compared to Eastern Europe given that the latter's productivity is two and a half times that of Egypt. On one hand, this may be a positive dimension for Egypt-Europe economic partnership such that Egypt can exploit its low relative labor cost compared to Europe and hence achieve progressive development as trade intensifies. On the other hand, productivity is an important determinant of final output quality and such correlation is especially severe for the case of Egypt giving rise to lack of competitive advantage although relative comparative advantage may still exist.

Such facts imply a major challenge to Egypt's human development future. In essence, Egypt's low labor cost drives entrepreneurship towards labor intensive production which gives rise to a comparative advantage in certain sectors of the economy if traded. Such comparative advantage is not accompanied by competitiveness (i.e. there exists lack of competitive advantage), hence is not sustainable. Moreover, most

industries in which Egypt possess comparative advantage are already moving towards a capital intensive production framework whereas local performance still favors labor intensive production (*see* El-Naggar 1993, Evans-Klock and Lim 1999, and Handoussa 2005).

On the gender dimension, Egypt's performance is on par with the world average. Hence, although one would have hoped for a better performance in light of the massive media campaigns and excessive government directives along the equal gender dimension in work and education (Egypt Human Development Reports), yet Egypt's gender development index (adjusted by aversions to educational attainment, income levels, and livelihood measures) is the same as that of the world average. Furthermore, gender as it relates to poverty is particularly weak. This is logically evident since gender development in Egypt and the MENA region are on equal footing, but the poverty count in Egypt is more than twice that of the MENA region. This implies that current and historical government directives have been biased towards *general* gender issues rather than '*gender as it relates to poverty*' concerns. On the official gender inequality scale, performance is in line with the world average, yet it is evident that for matters concerning the gender-poverty dimension, Egypt's performance is inferior.

Income distribution as measured by the Lorenz curve in Egypt is adequate. It is better than the world average, slightly better than MENA and Asia/Pacific, much better than Latin America and Africa, and almost on equal footing with Eastern Europe. Reasons for this are numerous of which the most important are the historical post-revolution social policy dimensions which still have their economic impacts until today, in addition to cultural and religious convictions of an emotional society.

Income distribution as it relates to output productivity is particularly important for the case of Egypt. Having in mind Kuznet's hypothesis (inequality rises and then falls with economic development in accordance with cross-industry relative wage ratios of labor scarcity); *Egypt may face Kuznet's challenge in human development*: Egypt is in a strong need to increase its output productivity and hence per capita income. This may result in unbalanced economic development which can hurt low income segments of the population i.e. the rich may become richer and the poor become poorer. This is a repercussion of modernizing the economy such that modern sector wages rise more than proportionally to traditional sector wages. Hence, increasing productivity while maintaining current income distribution is an economic challenge for Egypt's future generations. There are two ways out of this trap. One way is to be patient. That is, inequality will rise due to increased productivity in the modern sectors of the economy, but labor in the traditional sectors of the economy can then adjust their skill patterns towards more labor migration from the traditional to the modern sectors, on top of the positive externalities existing out of the modern sector such that previously traditional sectors modernize themselves. These actions can be challenged by market forces particularly in the Egyptian labor market. This will induce more labor supply with modern skills development resulting in a lower relative wage ratio between modern and traditional sectors which will eventually lead to a fall in inequality of incomes. An alternative approach is tax and subsidy reform. If increases in output productivity drive more income inequality, then a tax correction scheme should be enforced to maintain income distribution, in addition to intensifying targeted food subsidies for the very poor. This needs a reformation of the social contract between citizen and state such that food subsidies are only directed at the very poor segments of the population (and *not* to the entire poor population) whereas taxing the rich should not provide a disincentive for investment expansion or business entrepreneurship. Such a scheme, if correctly enforced, would provide a balance between increases in output productivity and its related gains in economic development while at the same time maintain the current income distribution as adequately as possible.

Egypt's position in terms of social entitlements and livelihood is superior on paper yet fail in practice. Access to water supply is 97% (compared to a world average of 80%), access to a health source is 88% (compared to a world average of 70%), and life expectancy is 68.3 years (compared to a world average of 63.3 years). This ensures that social entitlements in Egypt are not lacking in access but are lacking in their

performance. That is, although access to a water supply may be evident and available, water quality and water pollution remain a serious problem. Similarly, access to a health source is widespread yet reliability and performance of health services are not as superior as their access may suggest. From a social welfare viewpoint, Sen's entitlements are met whereas Sen's functionings are not. This is essentially due to lack of resource capabilities. Thus, resource efficiency concerns mount again versus mere availability of resources. This, again, is due to historical socio-economic policies which may have been adequate for their time but have proven to be not sustainable.

Education and illiteracy remain a puzzling paradox for Egypt. Performance measures indicate that *Egypt's relative position in education is high whereas its position in terms of illiteracy is low.* It is seen that Egypt's educational attainment is as high as Europe, whereas Egypt's illiteracy is as low as Africa. A rational economist must ask why such a paradox exists. One main reason is that state education policy is not properly directed towards critical social goals: "free education for all" is failing. The government has been spending for all levels of education and forgetting the most basic education of all: illiteracy! Such an education policy is not sustainable and does not lead to long run social gains. On the contrary, a drastic change in education policy is needed such that more resources would be directed towards illiteracy and primary education, while leaving higher levels of education to market forces. Hence, a drastic change in education policy is needed. At the same time, 76% of educational attainment as compared to 64% of world average ultimately produced $3520 of output efficiency as compared to $4727 of world average. Economically and rationally speaking, this means that Egypt have spent 12% *more* on educational resources while producing 34% *less* in relative output productivity. This is not a feasible social investment.

5. Conclusion

Overall, Egypt's relative performance in human development can be summarized in compact form by the following main points which serve as recommended strategies:

1. Egypt is above par in its income distribution policies but below par in the level of income itself as reflected in low output productivity. It has "hunger-free poverty" due to an impressive low poverty gap, yet the country's productivity must increase by at least one third in order to cope with its MENA regional partners.
2. Egypt fairs well in general gender issues although expectations seemed higher. More effort needs to be directed to specific issues of gender rather than general gender issues. In particular, gender as it relates to poverty must take highest priority in future human development policy.
3. Egypt is superior in social entitlements on paper, while those entitlements fail in practice due to limited resource capabilities. Hence, although access to entitlements is guaranteed, functionings of such entitlements are weak and ultimately fail. This necessitates a new social contract between citizen and state.
4. Egypt's education system is irrational: she is as Europe in education enrollment and as Africa in illiteracy! Such a paradox means that current education policy is not sustainable and will not lead to long run social gains. In particular, the "free education for all" system must be radically changed towards more resources directed at illiteracy and primary education while leaving higher levels of education to market forces.
5. Generally, based on social welfare rankings, Egypt ranks 41/79 in terms of human development. This rank is slightly below world average (median 39) and further below the average of MENA region (median 35). This calls for a new internal-external resource balance. In terms of internal factor allocation, Egypt must shift its production possibilities up while maintaining its income distribution, and should utilize a policy shift from non-physical necessities (social livelihood) towards more physical necessities (income productivity). At the same time, Egypt's potential for external partnerships is evident: it can have a leading role in "hunger-free poverty" as compared

to Africa and must exploit its comparative advantage with Europe as long as its competitive advantage is on par with the MENA region, a challenge which is not yet achieved.

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Table 1: Comparative Human Development: Egypt and the Developing World

	Poverty (< $2/day) % pop	Poverty Gap %	Poverty Expenditures $/person/yr	PPP GDP $ per capita $/person/yr	Gender GDI (0-1)	Inequality Gini (0-1)	Clean Water (% pop)	Health Source (% pop)	Life Expectancy (yrs)	Education %	Illiteracy %
WORLD	42.01	0.20	142.96	4727.59	0.65	41.82	79.58	69.68	63.35	0.64	0.21
MINIMUM	2.00	0.00	0.73	570.00	0.28	24.00	24.00	10.00	33.40	0.07	0.00
MAXIMUM	98.40	0.71	519.03	17130.00	0.88	60.30	100.00	100.00	77.90	0.95	0.75
EGYPT	**43.90**	**0.11**	**82.49**	**3520.00**	**0.63**	**34.40**	**97.00**	**88.00**	**68.30**	**0.76**	**0.44**
MENA	19.19	0.05	37.14	4518.75	0.65	37.96	85.63	79.06	68.50	0.66	0.32
AFRICA	65.38	0.35	254.07	2362.50	0.47	44.79	65.88	62.29	49.70	0.50	0.41
ASIA PACIFIC	42.33	0.16	114.18	4218.64	0.67	36.95	82.36	69.70	66.55	0.68	0.18
LATIN AMERICA	29.97	0.15	108.35	5633.16	0.74	50.85	87.21	67.32	70.64	0.70	0.12
EUROPE	14.26	0.05	34.03	8830.00	0.81	31.83	88.08	87.04	72.07	0.77	0.03

	Welfare Index	Welfare Rank
WORLD	0.20	--
MINIMUM	0.00	1
MAXIMUM	1.00	79
EGYPT	**0.13**	**41**
MENA	0.18	35
AFRICA	0.06	60
ASIA PACIFIC	0.18	39
LATIN AMERICA	0.20	33
EUROPE	0.49	13