ECONOMIC GROWTH, DEVELOPMENT AND POVERTY DYNAMICS: AN INSIGHT FROM THE SOCIAL FIELD THEORY

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Abstract.*A review of the relationship between economic growth and incidences of poverty in the USA suggests that there are conflicting relationships over time between these two measures of the economy that can be attributed to the trickle-down effect. We revert to science and expanded the Social Field Theory in order to examine the relationship between economic growth and poverty by grouping the means of production into two categories: capital and capabilities. Balancing forces of capitalism by that of capabilities can be one way forward towards creating a stable upward economic and social mobility.*

Keywords: *social field theory, economic growth, development, poverty, economic entropy.*

PACS numbers: 89.65.Gh, 89.70.Cf, 05.45.Ln

1. INTRODUCTION

Many researchers have analyzed pooled data in order to understand the casual relationship between economic growth and poverty. Analytical tools range from the measures of central tendency to that of dispersion; as well as, simple linear regression to non-linear models. The relationship seems to be dependent on what segment of data is elected, along with which analytical tools and methods are used. This is quite natural, however, conclusions drawn out of the same data set, even of the same studies, are found to be dependent on the researchers interpreting the results. It prompts a premise that economic growth may have differential impacts on incidences of poverty at different point in history, geography; the magnitude of economic growth must also be taken into consideration. In addition, there may be some endogenous or exogenous factors that have never been taken into account for such analysis.

President John F. Kennedy famously promoted the slogan 'A rising tide lifts all boats' which implies that economic growth should benefit all by wealth trickling down from the wealthiest to the rest of society, including its poorest. This popular notion seems to be supported by statistics: the percentage of US families with incomes of less than $3,000 (in 1963 dollars) fell from 31.4 per cent in 1947 to 18.5 percent in 1963. While John Kenneth Galbraith and Michael Harrington have argued against the validity of the trickle-down effect, it is probably Anderson [1] who first dissected the census data (1947-60) in order to demographically isolate groups of vulnerable individuals in the society who were 'untouched' by changes in the levels of income enhancement attributed to the economic growth. Using the log of median income distribution at various phases of economic growth Anderson [1] underscores the diminishing effects of growth on poverty in America. Thurow[2] used a linear regression based poverty model, attempting to identify the relative importance of different factors contributing to a sharp decline in incidences of poverty in the period. The TAL[3] bivariate model contributed to knowledge base of the diminishing effect principle, even though Hirsch [4] criticized the selection of dependent variables in the model to suggest that there is not any significant evidence that the beneficial relationship between economic growth and a reduction in poverty petered out in the post Kennedy period. Aghion and Bolton [5] proposed a model of growth through which they analyzed the trickle-down effect of capital accumulation. They suggested three phases of economic growth and inequalities resembling that of a Kuznets curve. Enders and Hoover [6] could not accept the outcomes of other studies [7,8] that argued that the aggregate of poverty was less responsive to the expansion of the 1980s than it was to the expansion of the 1960s. Hence they explored information that may have been missed by linear regression models. Using non-linear model backed by Fourier approximation, they came up with a different conclusion that 'robust' growth has a more than proportional rate effect in reducing poverty. Another study [9] analyzes the diminishing effects of economic growth on poverty during the 1990s. Above and beyond the diminishing effect, a research conducted by Greenwood and Holt [10] explains how the negative effect of the trickle down policy has lowered many people's wellbeing. The president of the World Bank, Jim Yong Kim, has publicly admitted that economic growth is "not enough" to end global poverty [11]. In a half decade since President Lyndon Johnson launched a 'War on Poverty' the official poverty rate declined [12] from about 19% to 14.5% in 2013, a 50 basis point down from the previous year.

Evidently, we can conclude that the relationship between economic growth and poverty is still an open question that demands a careful review. Arguments against or in favor of economic growth as a singular way to alleviate poverty do not converge even with more detailed and accurate data that we may amass over time. A research question such as this one that has important public policy implications need to be resolved as

early possible in order not to waste academic resources on debates producing more heat than light. Along this line, we expand on a seminal work by Irving Fisher [13] at Yale University on a framework of the Social Field theory [14] developed at University of Massachusetts. This is an evidence-based scientific attempt to uncover the true relationship between economic growth and poverty.

2. SOCIAL FIELD THEORY

The social field theory hypothesizes that the patterns of the general interactions of an individual in a society can be modeled the same way as other field concepts - such as Newton's laws pertaining to the Gravitational Field.

There are diverse beliefs about poverty that can be classified broadly into two: a) Poverty is Individual; and b) Poverty is Structural. Whatever doctrine one may follow, it is imperative from each perspective that both society and the individual are important aspect pertaining to the dynamics of poverty. There are examples of some countries that belonged to one side of development spectrum that have managed to move to other side within a generation through the collective efforts of individuals along with effective decisions made by politicians in those countries. Hence it is imperative to recognize that cohesion among individuals of a society united for a common cause is another important factor in understanding the dynamics of poverty. Even in this era of globalization, individual behavior is increasingly becoming the key factor that governs the evolution of both the world and society as a whole [15]. Hence, a general interaction between a society and an individual must take into account the parameters of society and the individual, plus a measure to gauge harmony between these two entities.

An individual in a society Ω may value or have reason to value a set of qualities say $\{x_1, x_2, \ldots, x_n\}$ with corresponding weight in order say $\{a_1, a_2, \ldots, a_n\}$. However, the society as an institution may have aggregate weight $\{w_1, w_2, \ldots, w_n\}$ different than the idiosyncratic view of the individual. For the sake of simplicity, we can assume that those qualities are common both to an individual and to a society that can be defined as the aggregate of people living together in a more or less ordered community. Hence,

$$\text{Societal Strength} < S >= f(w_i, x_i) \quad (1)$$

$$\text{Individual Strength} < I >= g(\alpha_i, x_i) \quad (2)$$

It will be ideal if those sets of qualities x_i be linearly independent tuples of vector $\langle S \rangle$ or $\langle I \rangle$. However it may not be possible to identify such independent variables within an ecosystem where elements are connected and, complement one way or another. The choice and weight of the element of those vectors S or I may vary across society and geography. Moreover a society evolve and adapt over time. In respect to the sovereignty of a society identifying her strengths, we will leave this to be defined in open academic discussion, in part inspired by Sen [16]. The Human Development Index (UNDP), Energy Development Index (IEA), OPHI Multidimensional Poverty Index [17] inspired by Sen's Poverty Index [18] are, in essence, attempts to identify strengths of societies in one way or another.

At a given instant $\langle S \rangle$ can be considered having a fixed magnitude $|S|$, and each individual will maintain a unique social distance, say r, in relation to its society. According to Wright [19], social distance is the relation of social entities to others measuring the degree of their contact or isolation. A reciprocal of social distance may be defined as trust vector (Γ), which can be a measure of degree of social cohesion or well-being. It can be measured utilizing Self-Anchoring Striving Scale [20], known as Cantril's Ladder popular in public opinion research.

Following the analogy of how this takes place in many other fields (such as gravitation, electrostatic, magnetic fields), the social field theory states that the binding force between a society of strength and an individual of strength $\langle I \rangle$ is

i. directly proportional to product of S and I; and
ii. inversely proportional to the square of the social distance r the individual maintain with society in equilibrium.

Mathematically, the social binding force (in natural units)

$$F = \frac{SI}{r^2} = SI\,\Gamma^2 \quad (3)$$

In this document 'Social Field' and 'Poverty Field' are used interchangeably to mean the same field concept as described above. In the social field, Intensity = S/r^2 and Potential = $-S/r$. Potential Energy = $(-S/r)*I \rightarrow$ Capabilities à la Amartya Sen$\rightarrow 0$ as $r \rightarrow \infty$.

We postulate:

HP01: Social field is a quasi-conservative field, defined as a field for which rate of change of total energy is a monotonic function of time.

HP02: Poverty levels are quantized in similar notion as in established models of an atom, Bohr's theory of the hydrogen atom [21].

3. CONCORDANCE TABLE: THERMODYNAMICS AND ECONOMIC

Following a seminal work by Fisher [13] in his Yale University PhD dissertation, the concordance table of terminology is updated incorporating knowledge from the most profound discoveries of the 20th century – namely quantum mechanics, relativity theory and the capability approach. Table 1 attempts to account for the hiatus that results from the evolution of walls among academia disciplines, mainly towards interoperability of nomenclature

Table 1 Concordance table between thermodynamics and economics

Thermodynamics		Economics	
CV	control volume	Ω	a political region (society)
Q	heat	Q	aggregate value, in absolute sense
T	temperature	S/r	economic temperature
ds	entropy change	dSI/S	economic entropy change
W	work	W	input for an economic process
KE	kinetic energy	C_1	capital, SI/2r
PE	potential energy	C_2	capabilities (knowledge, skill etc.), – SI /r
E	energy (KE + PE)	A	asset (capital + capabilities), $A = C_1 + C_2$
m	mass	$\Im$	social inertia
v	speed/velocity	G	growth/development, dA/dt
a	acceleration	dG/dt	rate of change of growth, d^2A/dt^2

In the analogy term with classical mechanics, velocity corresponds to the rate of change of the social distance, dr/dt. In the Social Field $F = \frac{SI}{r^2}$, and the asset $A = -\frac{1}{2}\frac{SI}{r}$ Hence we can write: $F = -\frac{2Ar}{r^2} = -\frac{2A}{r}$. For a given time, say F is constant, the ratio of the asset and the social distance is constant.

This also implies that dA/Adt = −dr/rdt. Hence the growth rate, dA/dt, can function as a proxy of velocity in classical mechanics.

Paul Samuelson, the first American to win the Nobel Memorial Prize in Economic Sciences, credited Fisher's dissertation as being the best doctoral dissertation in economics [22]. Exact sciences have long been intertwined with the evolution of economic thought. Philip Mirowski [23] has summarized the neo-classical approach in economics considering analogies between economic and physical systems. A book by Weintraub [24] highlights important episodes in the mathematization of economics. A critical but thorough review of efforts so far in connecting thermodynamics and economics has been summarized by Glucina and Mayumi [25] in a language that is comprehensible to general readers. At the same time they also undermined another landmark effort made by a physicist Wayne Saslow [26] towards exploring economic analogues to thermodynamic variables. One of their conclusions was that there are a number of thermodynamic variables that do not have counterparts in economics. This does not seem to fully confer the cross-disciplinary wisdom the topic may demand. Evolution and the diffusion of mathematics and other sciences (exact and/or empirical) into other disciplines has, no doubt, benefited the disciplines by adding more quantitative framework and analytical knowledge. In the process they also bolster the qualitative approach required to make an analysis complete. Cross-disciplinary and Q-squared (quantitative and qualitative) approaches offer the possibility of combining the strengths of different disciplines [27] – such as the research question of this paper.

In the words of CédricVillani [28]: "As soon as you make connection between different fields, knowledge you accumulate here you can recycle there, and all of a sudden both fields are richer in terms of knowledge."

4. ASSET AND POVERTY LEVELS

Under the hypothesis [HP02] of this research, it follows directly from Bohr's theory of the Hydrogen atom, energy of an individual in the society,

$$E_n = -\frac{p_0}{n^2} \qquad (4)$$

The left hand side of Eq. 4 is the total energy, a sum of kinetic energy and potential energy. The lowest energy state is P_o (that correspond to ground level, n = 1, energy = 13.6 eV, electron-Volts, of Bohr's theory). In economic analogy (see Table 1), it translates to the lowest level of asset, a sum of capital and capabilities of an individual. P_o is a measure of extreme poverty in the absolute term and hence we call it Absolute Poverty on the same logic we define absolute temperature, the Kelvin scale in thermodynamics. The economic entropy of an individual shall be equal to zero at state corresponding to P_o. A change in asset (ΔE_n) is an indicator of economic growth. In this formula economic growth and poverty are positively correlated. As our universe's expansion is accelerating, so is probably the poverty field. The postulate [HP01] also backs up Townsend's [29] main thesis that both poverty and subsistence are relative concepts because the poverty field is also expanding due to the quasi-conservative nature of the social field.

In a book [30] Jeffrey Sachs reflects on a goal to help less

privileged people (from failed-states) reach the first rung on the "ladder of economic development". If there is a ladder in economic development, so must there be one for poverty which should substantiate [HP02]: the poverty levels are quantized.

5. AN ECONOMIC PROCESS

5.1 Means of production: capital and capabilities

A study of the economic process would be incomplete without linking it to the means of production. Classical literature usually studies the means of production (land, labor and capital) in isolation, without emphasizing or often even including underlying interoperability. When analyzing modern production processes and financial products, we argue that these means of production can be grouped into two broad groups: Capital and Capabilities.

Hence, following Table 1, total energy in equivalent economics nomenclature can be written as:

Social Asset A = Capital (C_1) + Capabilities (C_2)

$$A = \sum \frac{1}{2}\frac{SI}{r} + \sum (-\frac{SI}{r}) = -\sum \frac{1}{2}\frac{SI}{r} \qquad (5)$$

Eq. 5 indicates that capital and capabilities are interchangeable. This is what venture capital firms actually do – source investment in startup companies and small businesses with high capabilities for growth. We prefer to call the sum collectively an asset A of our society, or the drivers of growth/development. Only the realized capabilities, along with rotating capital, may have direct impacts on the growth/development processes. Non-rotating capital could be no more than not-realized capabilities, which may have negligible or even adverse impacts on development of our society.

Production processes have become more advanced since the industrial revolution and hence more capital intensive. The process has been driven by a combination of secular and structural issues such as the changing nature of technological advancement, the rise of "capital – take – all" investment characteristics, and political systems favoring the wealthy [31].

Accordingly the forces of capitalism are becoming more dominant over the forces of capabilities in the production process.

5.2 Economic process as an energy conversion process

An economic process in a society may be analyzed by using the control volume analysis of thermodynamics. Following concordance Table 1, the equation of the First Law of Thermodynamics

$$dE = dQ - dW \qquad (6)$$

translates to economics as

$$\Delta\text{Asset} = \Delta\text{Value} - \Delta\text{Work} \qquad (7)$$

where symbol Δ represents a change of the variable.

Let Q_1 be the value of input and Q_2 be the output of an economic process that demands work input dW. This process may be compared to the refrigeration/heat-pump cycle in thermodynamics; a caveat being that those cycles do not retain internal energy while an economic cycle must retain some in order to perpetuate its motion. Fig. 1 attempts to interpret terms of Eq. 7 graphically.

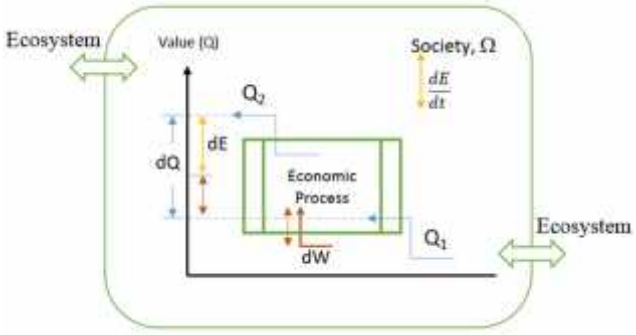

Fig. 1 Economic process and first law of thermodynamics

A coefficient of Production (COP) is the ratio of desired output to input. Hence,

$$COP = \frac{Q_2}{Q_1 + dW} = \frac{\text{Value of output}}{\text{Value of input + Work Expended}} \qquad (8)$$

It is critical for an economic process to have an operating margin to pay its fixed costs, hence COP > 1 in general. The numerator of Eq. 8 compares selling prices to the denominator of the cost prices of a product in layman's terms. The gross value addition dQ = $Q_2 - Q_1$. The net value addition is dE = dQ – dW = $Q_2 - (Q_1 + dW)$, sometimes also known as gross margin. This value belongs to the drivers of production – capital and capabilities – that are assets of the society Ω in which the economic process (production or consumption) happens.

6. MODEL OF ECONOMIC GROWTH

6.1 Nomenclature: Harrod-Domar model

The Harrod model [32] of economic growth shed light on three types of growth: a) warranted growth, b) actual growth, and c) natural rate of growth. Warranted growth rate is the rate of growth at which the economy does not expand indefinitely or go into recession. Later expanded by many including Domar [33] and Solow [34], these terms of the Harrod model are equally relevant to modern macroeconomics (as it is previously thought to be relevant only to single sector under non-idealistic assumptions). Domar contributed an article the same year that the renowned British economist Keynes died, hence beginning a new era of economic thought sometimes referred to as the post-Keynesian model. These models are known to us as Harrod–Domar models, or sometimes as the Harrod–Domar–Solow models. A classification and brief account of these models is documented in part II: The Process of Growth, of a book [35] by Scarfe. In this section we adopt terms used by Harrod and redefine the terms in light of our new Social Field Theory.

New definition:

a) Natural growth rate (r_n): The component of growth that

corresponds to the rate at which the quasi-conservative social field, monotonic function of time and space, advances [HP01].

b) Warranted growth rate (g*): The rate of growth of an economy (in a broader sense – that includes both capital and capabilities) in the long run.

c) Actual growth rate (r_a): The growth rate of an economy as measured now in terms of gross domestic product (GDP), the aggregate monetary value of all goods and service produced in a year.

6.2 Model of economic growth

Economic growth can be broken down into components discussed in previous section as:

$$\text{GDP}(\Omega, t) = \overline{\text{GDP}}(\Omega) + \text{GDP}'(\Omega, t) \qquad (9)$$

where $\overline{\text{GDP}}(\Omega)$ is a monotonic component that can be linked to the natural growth rate (r_n) ofa region Ω. GDP′ (Ω, t) is the fluctuating component whose value, positive or negative, depends on the relative magnitude of r_n, r_a and g* along with the addition of the endogenous and exogenous shocks. In this separation of the variables, inspired by the Reynolds [36] decomposition, the mean of the fluctuating quantity GDP′ (Ω, t), may not always be equal to zero. Even though we have used a variable GDP, it does not mean to the GDP as it is measured but the warranted growth rate g*.

In the following paragraph, we utilize the law of conservation of energy (the first law of thermodynamics) to explain economic growth. The law dictates:

$$dQ = dE - dW$$

$$dQ = d(C_1 + C_2) - dW$$

$$1 = \frac{dc_1}{dQ} + \frac{dc_2}{dQ} - \frac{dW}{dQ} \qquad (10)$$

After deducting proportion of effort, $\frac{dW}{dQ}$ in order to realize an economic process, the value remaining is the share of capital and capabilities.

Analyzing capitalism with historical data amassed, Piketty [37] concludes that the capital has disproportionately claimed, time and again, the rate of return on capital r >> g, the growth rate of economy.

Capital can only grow at a rate higher than the growth rate of an economy at the cost of capabilities. During r >> g period, Eq. 10 suggests a large portion of the dC_2/dQ that belongs to a society (or stakeholders) as public wealth is transferred to the capitalists. This conversion mechanism of capabilities to capital and vice versa results into cyclic 'boom and bust' periods of an economy as presented in Fig. 2 for the USA from 1854 to 2009 plotted from data furnished by National Bureau of Economic Research (NBER). This ebb and flow, however, continues in conjunction with the inherent natural growth rate, $\overline{\text{GDP}}(\Omega)$, due to the quasi-conservative nature of the social field.

Fig. 2 Economic cycle expansion and recession, USA (1854 - 2009)

A Harvard University study [38] has analyzed global subjective well-being data. The study reveals that individuals are more sensitive to losses than gains. To be more specific, losses having more than twice as much impact on well-being as compared to equivalent gains. The asymmetrical results highlight the cost of welfare, along with the relationship between GDP and subjective well-being in terms of the economic growth cycle. Hence, in the long run a society may be better off by balancing capabilities and capital instead of focusing merely on economic growth as measured by GDP.

Let us zoom into a specific example of the economy in the USA, using our model of economic growth represented by Eq. 10 as our lens. Fig.3 presents the US business cycle expansions and contractions around the most recent recession in 2008.

Early recession in the USA began in December 2007 at the point B where dC_1/dQ is equal to zero. Between the segments BCD, this ratio is negative which translate to that the GDP contracted until the end of the late recession in June 2009. The last early expansion began in June 2009, the GDP equalize to the natural growth rate value, $\overline{\text{GDP}}(\Omega)$, at E.

The GDP contraction B through D gives C_2 an opportunity to accumulate. A conservation law of asset A implied by the Eq. 10 suggests D is the point at which the capabilities C_2 should be at a maximum. Beyond D, C_1 expands (if r_a is still greater than g*) at the cost of C_2. This transformation, at least in theory, can be prolonged to a point when the minimum threshold of capabilities C_2 is reached again. This results in inherent oscillations between economic expansion and contraction commonly known as periods of economic 'boom and bust'. The NBER has recorded periods of contraction and expansion in the business cycle since as early as June 1857 to as recent as June 2009.

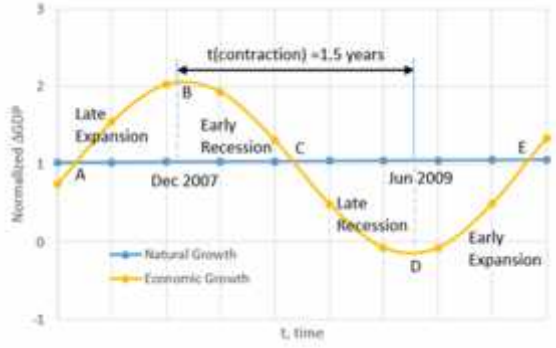

Fig. 3 Economic cycle USA recession (2008)

In the long run, the economic growth tends to stabilize, say to g*. This growth rate will not be enough to balance the tendency of the rate of return on capital [37]. Increasingly capital uses its power to claim shares of social capital and eventually dC_2/dQ could be negative when here is an unbridled desire to make capital grow. Such a situation may lead an economy into recession (recently in 2008) that can be detrimental to secure financial stability and growth let alone to the well-being of the society.

Hence in a deregulated economy, $r_a >> g^*$ may eventually lead an economy to a boom and bust that then spreads across borders due to the globalization of economies, among many other reasons. An economic growth not accompanied by investment in capabilities development is simply unsustainable.

6.3 GDP: an ideal measure of growth?

In terms of the Newton second law of motion, the analogy to economic growth is that the net force in an open society could be the sum of the endogenous (F_{en}) and exogenous (F_{ex}) forces that compares the body forces and the surface forces in mechanics. Hence,

F_{NET} = Social Inertia × rate of change of growth G,

$$F_{en} + F_{ex} = \Im \text{ x } d^2A/dt^2. \tag{11}$$

where A is a social asset, the sum of capital and capabilities. Social inertia is a term that applies the concept of inertia to other fields, in particular social science fields that describes resistance to change or the endurance of stable relationships in societies or social groups. Social inertia can be thought of as the opposite of social change.

The equation, Power = Force × velocity, in mechanics translates to the economic science as

$$\frac{dE}{dt} = \frac{SI}{r^2} x \frac{dA}{dt} = \frac{SI}{r^2} xG \tag{12}$$

We consider only the endogenous force, and assume that the force and velocity are in the same phase/direction, and there is no retardation potential.

From Eq. 5:

$$\frac{dE}{dt} = \frac{d(-\frac{SI}{2r})}{dt} = -\frac{1}{2}\frac{r\frac{d(SI)}{dt} - SI\frac{dr}{dt}}{r^2} \tag{13}$$

Combining Eq. 12 and Eq. 13, growth rate

$$G = -\frac{1}{2}\left[\left(\frac{r}{SI}\right)\frac{d(SI)}{dt} - \frac{dr}{dt}\right] = \left(\frac{1}{2c_2}\right)\frac{d(SI)}{dt} + \frac{dr}{dt} \tag{14}$$

$$G = -\frac{1}{4}\left(\frac{2r}{SI}\right)\frac{d(SI)}{dt} + \frac{dr}{dt} = \left(\frac{-1}{4c_1}\right)\frac{d(SI)}{dt} + \frac{dr}{dt} \tag{15}$$

Our current practice of measuring the economic growth in terms of GDP, as $(\frac{1}{c_1})\frac{d(c_1)}{dt}$ for a fiscal year, seems to be missing some dimensions that are important to a society. GDP does not take into account changes in the social asset (entropy-strength), $\frac{d(SI)}{dt}$ and the social distance, $\frac{dr}{dt}$, as suggested by Eq. 15. Therefore, GDP be termed as incomplete even though it is still a practical measurement. Though there needs to be a consensus on a more comprehensive method to measure social assets in relation to the overall GDP.

7. ECONOMIC GROWTH AND DEVELOPMENT

In economic literature we come across many phrases such as Economic Development, Human Development, Inclusive Development, and Sustainable Development. Development, according to the Cambridge Dictionary, is "the process in which someone or something grows or changes and becomes more advanced". According to the Human Development Report [39] "human development is the end—economic growth a means." For a society or a political region, development refers to the advancement of all concerned – an inclusive development - definitely not to the lopsided development where one economic strata advances at the cost of the other. An overriding preoccupation with economic growth makes no sense without recognizing that human development depends on how that wealth is used and distributed [40]. In the following paragraph, we examine nuances between economic growth and development in light of the Social Field theory.

Fig. 4 presents a diachronic analysis of a political regime Ω. At a reference point in time t_o, let the absolute poverty be Po. A_1B_1 represents line of the social hierarchy; the inclination θ_1 with horizontal time-axis represents inequality prevalent in the society at time t_1.

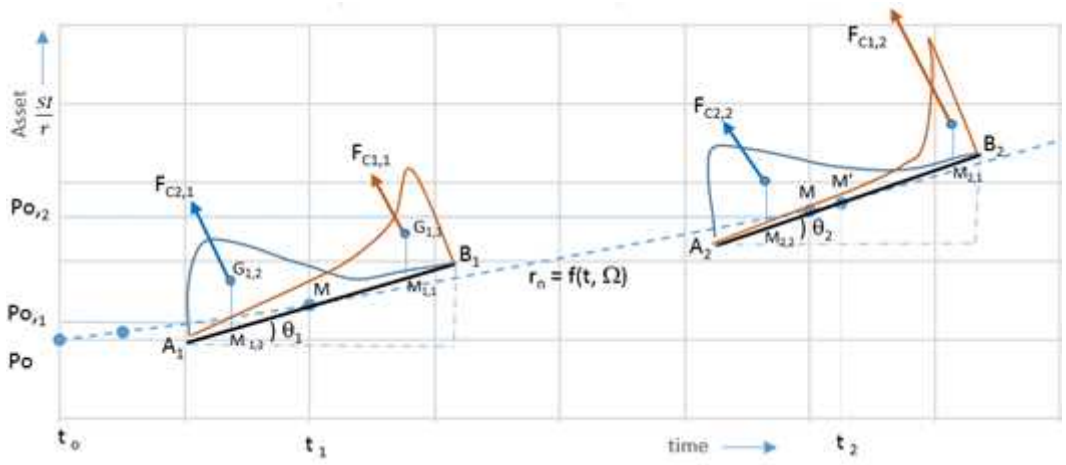

Fig. 4 Dynamics of growth – capital and capabilities

F_{C1} is the forces of capitalism which acts at centroid $G_{1,1}$ of the capital distribution curve, whereas F_{C2} is the forces of capabilities that acts at the same way but at the centroid $G_{1,2}$ of the capabilities distribution curve. In presence of these duo forces, society yields to another state of equilibrium, *ceteris paribus*. F_{C1} tends to rotate line AB counterclockwise towards greater inequality. At t_1, the rotation hinges at M, the social fulcrum at which the social inertia,$\Im$, of the society may be assumed to be concentrated. In contrast, the force F_{C2} tends to rotate the same line in clockwise direction towards a more homogeneous or egalitarian society. Thomas Piketty [37] indicates to these two forces by the terms Forces of Convergence/ Divergence.

At time t_2, $F_{C1,2} >> F_{C2,2}$ results in the more unequal society and hence more pronounced social classes. To maintain an equilibrium, the fulcrum must move up making more people vulnerable to the poverty line $P_{O,2}$. Only those social classes above the new fulcrum M′ gain from spurred economic growth. Many public policies are known to create financial winner and losers in society, as is the case shown here. Such economic growth will inherently cost people below M′. Hence, economic growth will always have a toll on the bottom strata of the social hierarchy, not to mention poverty in general. The analytical reasoning presented above strengthens the argument that poverty is inherently entrenched below economic growth. Balancing the forces of capitalism by those of capabilities in order to improve a society demands an inclusive development. A balance can expand the trust vector (social cohesion), rule of law, and unlock economic potential. Not to mention that balanced economic development has many possibilities though it must also overcome the social inertia as evidenced from many examples demonstrated by Newton's second law of motion.

Hence it is the development that matters for the well-being of the society at large while economic growth must be seen in this light as only a part of the equation, undoubtedly an important one. A rise in inequality has been a signal global feature of economic growth as if there are no recourses. Economic growth and development are not the same terms but are correlated. For example in the case of inclusive development, it takes place in a way that may not be as explicit to the naked eye.

8. SUSTAINABLE DEVELOPMENT

The unlimited possibilities for balanced economic development ought to conform to the sustainability of our ecosystem. This implies an inclusive development that takes into account the ecosystem as being part of an optimal sustainable development, or a sustainable development goal. According to the 1987 report by the United Nations World Commission on Environment and Development, development is sustainable if it "meets the needs of the present without compromising the ability of future generations to meet their own needs." The famous Rio Earth Summit Declaration, adopted by the United Nations Conference on Environment and Development in 1992, puts it this way: "Human beings are at the center of concern for sustainable development. They are entitled to a healthy and productive life in harmony with nature."

A growth of one demographic group does not require to be at the cost of the other human beings, especially those at the lower social hierarchy. Capital and capabilities together can go a long way toward mitigating economic 'boom and bust' (or winner and losers) cycles and preserving the social wellbeing of current and future generations.

9. CONCLUDING REMARKS

The Social Field Theory along with the law of conservation of energy (First Law of Thermodynamics) has the potential to explain and redefine economic expansion and recession. In conjunction with the natural growth rate, the economic growth cycle oscillates due to relative changes in two means of production: capital and capabilities. As consensus parameters that can measure social asset and trust vector (social cohesion or wellbeing) are accomplished, a better measurement of growth can be initiated to complement gross domestic product (GDP) and result in a more complete measure of economic growth. Economic growth and absolute poverty are positively correlated. The trickle-down effects of economic growth are not an 'absolute' truth. Economic growth always produces

winner and loser. The demographic group at the lowest strata of the social hierarchy loses from economic growth while the groups at the higher strata (above social fulcrum) gain from the trickle-down effect. An inclusive development policy that can strike a balance between the force/energy of capitalism to that of capabilities can benefit all in society, and it is realizable. An inclusive development that includes our human society and physical environmental ecosystems is an optimal sustainable development path.

10. ACKNOWLEDGEMENT

We are thankful to the William Heronemus Fellowship, and Energy for Capabilities Development (e4CDp) for supporting this study in part. Shreekar Pradhan, James Abro and Camilla Kennedy supported us with comments. The first author benefited from lectures by J. Mohan Rao, Department of Economics at University of Massachusetts. The authors declare that they have no relevant or material financial interests that relate to the research described in this paper.

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