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# AGRICULTURAL COMPETITIVENESS: MARKET FORCES AND POLICY CHOICE

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*Transition Strategies Towards a New World Order for Five Rural Worlds*

**INTRODUCTION AND DEFINITIONS**

To put into perspective the problems of humanity on the eve of the twenty-first century, I ask the reader to imagine a country which is subject to climatic variations, needs to achieve a major structural adjustment of its macroeconomy, is composed of several different ethnic groups, some of which are threatening to secede, and is being called upon to participate in a regional common market. Perhaps you thought of an African country of the capitalist Third World, such as Chad. And of course you were right. But you could also have mentioned Canada and other nations of the capitalist industrial world (including the European Community), who now find themselves at the mercy of acid rain and the greenhouse effect, who must reply seriously to the demands of native groups, who are in full macroeconomic crisis with massive debt loads and who must each find their place in a continental economic union.

Nor would you have been wrong if you had mentioned countries of the former centrally planned socialist world, such as Lithuania, Georgia, Hungary and the other members of the proposed Slavic common market, generally northern countries with a short and variable season for agricultural production in need of massive restructuring of the roles of the state and of the private sector within the economy. In short, it can be argued that all the economies of the planet are in the midst of a period of transition of unprecedented proportions. Therefore limiting the term 'economies in transition' to countries of the former Soviet bloc seems too restrictive. Each economy must determine the weaknesses which must be corrected if it hopes to create workable strategies of progress towards participation in a better world order.

*Definitions of world order*

World leaders and citizens find it difficult to agree on what is meant by 'new world order'. George Bush, who popularized the term, seemed to imply the post-Cold War political and commercial hegemony of the United States. Evangelist Dale Robertson, in *The New World Order*, attacked the concept as a subversive plot by the world financial and socialist establishment to undermine

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American social values. Mikhail Gorbachev underscored the necessary moral dimension of such an order. And Vice-President Gore's *Earth in the Balance* pleaded for a spiritual transformation of the 'internal ecology' of each individual to stop the destruction of the planet's resources.

In the face of such disagreement, what would seem to be the common principles of any workable conception of a new world order? Four minimal principles that should underlie it are efficiency, equity, equilibrium and evolution (Table 1). These should speak instantly to agricultural economists, for our International Association has sometimes selected them as key words within the overall themes of its meetings! But these principles also find expression in other realms of human thought: physics/ecology, political science/sociology and morality/theology. The need for interdependence in the real world is thus reflected in the possibility of shared paradigms of the intellect, for each discipline has strengths and weaknesses in conceptualizing these principles. For example, standard economics can determine *efficiency* more powerfully than most disciplines. Even then, economic efficiency, when determined by markets alone, can lead to production according to artificial desires instead of true needs, and ignore negative externalities. Similarly, our marvellous proofs of equilibrium coexist with stagflation and a self-perpetuating economic dualism between North and South, East and West. This is, in part, because world prices constitute a minimalist version of the complete set of ethical values which could underlie international interdependence. Economics is perhaps weaker than other disciplines when it comes to equity and evolution. For *equity* the concept of 'Pareto optimality' fails to challenge the pre-existing distribution of wealth in society or transcend marginalist statistical analyses of the apparent

**TABLE 1** *Four guiding principles for transitions to a new world order*

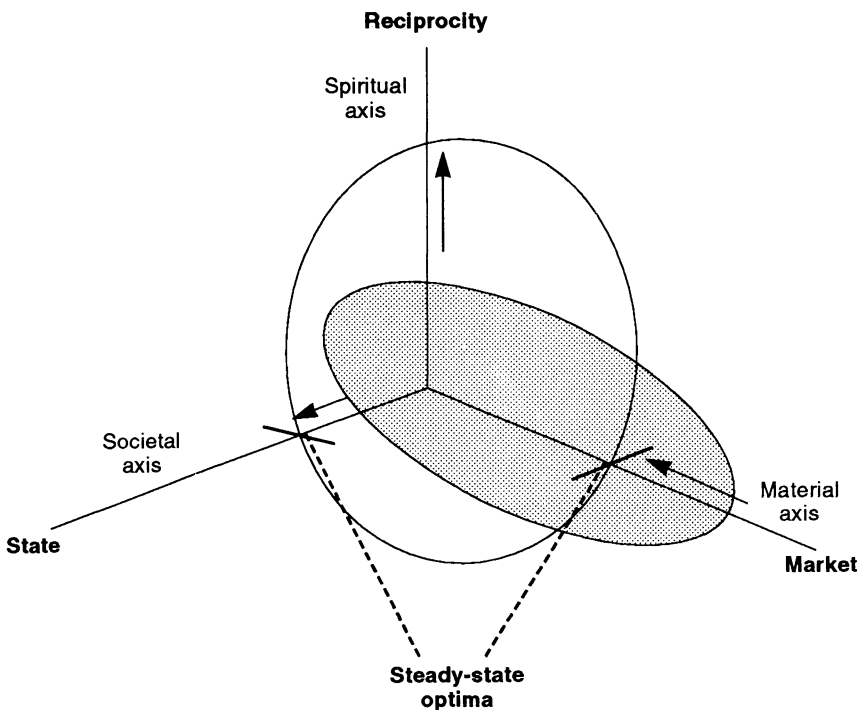
	Physics/ ecology	Economics	Pol.sci./ sociology	Morality/ theology
<i>Efficiency</i>	Conservation v. Pollution	Efficiency v. Waste	Minimalism v. Domination	Ecumenism v. Proselytism
<i>Equity</i>	Mutualism v. Predation	Equity v. Poverty	Justice v. Oppression	Tolerance v. Intolerance
<i>Equilibrium</i>	Symbiosis v. Extinction	Equilibrium v. Instability	Cooperation v. Conflict	Unity v. Persecution
<i>Evolution</i>	Evolution v. Explosion	Development v. Maldevelopment	Progress v. Cynicism	Revelation v. Fundamentalism

conflict with efficiency. And development economists have followed a sequence of hot topics (for example, 'green revolution', integrated rural development and structural adjustment) rather than addressing head-on the need for a unified theory of socio-economic *evolution*.<sup>1</sup>

### *The three dimensions of transition*

The primary objective of the transition to any new world economic order should be to increase happiness and welfare at all levels ranging from the individual to the world community. By contrast with Benthamite 'utility', *happiness* refers to the comprehensive joy felt by an individual at a given moment. Geometrically, it can be represented as the shaded spheroid resting upon the three axes of material, social, and moral well-being in Figure 1.<sup>2</sup>

What justification do we have for this three-polar view of happiness? We sometimes forget that Adam Smith's *Wealth of Nations* was a technical work designed to explore the feasibility of building an economy upon minimalist expectations of human nature. In his first sentence, Smith recognized that the



**FIGURE 1** *The three axes of individual and social transition to the new world order*

Invisible Hand of self-interest is an inferior force for promoting society's evolution. It is *sympathy*, his mentor Hutcheson's preferred social equivalent of gravitation in physics, that pervades Smith's *Theory of Moral Sentiments* as a force for positive social evolution towards a post-capitalist order. For sympathy helps man to feel and appreciate benevolence and to refer to a moral 'impartial spectator' or conscience. Smith argues that Nature teaches man to put family, friends and the nation first and even goes so far as to describe his ideal of world citizenship.

Similarly, mainstream economics recognizes Walras as one of the great economists of all time, but for another reason than he might have wished. Walras's mathematical proof of the existence of a static, general equilibrium in a market-based economy is a technical *tour de force*. Yet the three-quarters of Walras's work which he himself considered most important consisted of a set of cooperative theories for the dynamic transformation of society.<sup>3</sup> Such prescription was clearly aimed at the establishment of a new world order through progress along the three axes of Figure 1: 'The branches of a single trunk establish the relationships among physics, morality and metaphysics. The social state will change and another age is preparing itself for humanity.' Because Walras believed that science would be eventually joined with morality, he called himself a 'scientific spiritualist'. Thus, for Walras, static happiness is enough. Smith agrees, arguing that a dynamic expansion of happiness is essential to a true feeling of *well-being*. The white spheroid symbolizes a higher level of happiness than the shaded (as well as a modified weighting of the three axes) and the transition between the two (represented by arrows) increases well-being.

Macrosocially as well, a community (whether village, nation or planet) enjoys at any given time a level of *welfare* determined by the distribution of happiness among its residents (shaded spheroid, Figure 1). Historically, market-oriented, First-World economies may be seen to have achieved the highest position on the material axis; Second-World socialist regimes the greatest equality on the social axis; and Third and native world communities founded upon gift and reciprocity, the highest goals on the moral axis.

While the definitions of 'market capitalism' and 'centrally planned economy' are well known to any agricultural economist, 'reciprocity' is as yet less well understood. Reciprocity has several near-synonyms in the literature: third pole, integration, ethics, morality, Golden Rule, justice, loyalty, love, legitimacy and gift. For example, Boulding (1981) argues that the third pole serves mainly to 'integrate', as opposed to the first, market-based pole ('exchange') and the second, central planning pole ('threat'). For Rawls, in *A Theory of Justice* (1971), reciprocity represents an alternative to Benthamite utilitarianism called the 'original position': if one is waiting to be born and does not know beforehand in which century or socioeconomic situation one will have to live, one tends to propose a very equitable set of economic laws for society.

Contrary to this vision of three poles, economists usually portray exchange as a meeting of two egos. Gift is excluded as a counterpoise to bargaining power. Vanek (1970) and Kolm (1984) take exception to this portrayal of what happens within the Edgeworth box. They demonstrate that the social (Vanek) and moral (Kolm) optimum lies elsewhere than the point determined by the

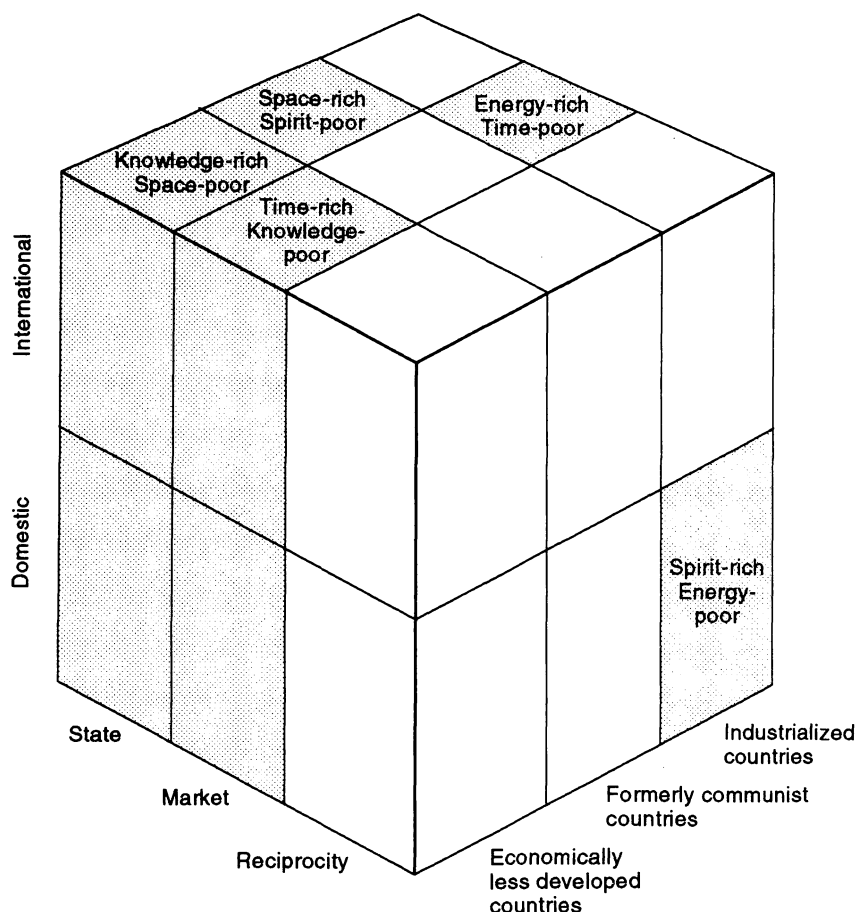
clash of market egos. Kolm goes so far as to present a general theory of reciprocity based upon non-market exchanges through gifts and counter-gifts. He deplores the paradox that, although most individuals would rather give than sell and receive than buy, industrial society has trapped them in a second-best world of impersonal market exchange. Several behavioural studies support the preference of the majority of people to live in a system of voluntary and anonymous generosity.<sup>4</sup> Therefore the challenge of the transition to a New World Order is to establish the structure of generalized reciprocity so that the majority<sup>5</sup> will feel comfortable enough to follow its guidelines. It was Aristotle who catalogued the transition from an ancient world order based on reciprocity (*metadosis*, 'the act of giving a share') to a classical world order based on markets. Present-day economists are called upon to chart a similar transition to a post-industrial new world economic order which integrates the strengths of markets, centralized coordination and reciprocity.

*Socioeconomic development* then becomes the progressive expansion of welfare towards a new dynamic equilibrium among market, state and reciprocity. Thus the transition from the shaded to the white spheroid of Figure 1 is not necessarily a homothetic expansion along all three axes. True, the optimum is conceptually identical to the maximum on the moral axis because no negative externalities attend the spiritual growth of each individual. But ecological constraints on the material axis, and a potential conflict between personal freedom and law and order on the social axis, dictate a steady-state equilibrium as the optimum on these latter two. Because their present spheroids are either lopsided on the material and social axes or underdeveloped on the moral axis, most of the world's economic contexts are 'maldeveloped'.

## FIVE RURAL WORLDS OF HUMANITY

It may be helpful to classify such contexts as belonging to socioeconomic systems of nine general types (Figure 2). These systems result from crossing one of three institutional bases (the state, the market or 'reciprocity' – a shorthand term for the spontaneous and collective sector) with one of three locational parameters (the economically less developed Third World, the formerly communist Second World or the industrialized First World). The two cubes in each stack emphasize that the rural economy is important not only within the national economy but in terms of regional integration, trade, aid and environmental issues. The five (partially) shaded stacks capture the majority of *existing* situations in the present world economy.

The names of the five rural worlds in Figure 2 are inspired by Boulding. He argued that space, energy, time, materials, and knowledge are a more useful grid for a dynamic classification of society's resources than the standard land, labour, capital and management of agricultural economics.<sup>6</sup> Using the suffixes '-rich' to indicate relative endowment and '-poor' relative absence, the United States and other countries of the capitalist First World may be known as 'energy-rich/time-poor', Nepal and other countries of the capitalist Third World as 'time-rich/knowledge-poor', Georgia and other countries of the ex-centrally planned Second World as 'space-rich/spirit-poor', mainland China and the



**FIGURE 2** *Nine economic worlds of twentieth-century humanity*

countries of the socialist Third World as 'knowledge-rich/space-poor', and the Canadian Inuit and other native peoples living as minority populations within larger nations as 'spirit-rich/energy-poor'.

Admittedly, these ideal types represent a vast oversimplification of the richness of a given economic system. To say that Russia is 'poor' in spirit is to speak in comparative terms, with respect both to the other worlds and to the gap between the current situation and the ideal society as perceived by the Russians themselves. In addition, the same nation may contain more than one of these five ideal types at the levels of the region (with climatic differences



such as in the United States), the village (with caste differences such as in Nepal) or even the household (with separate gender economies such as in Chad). Thus planners may adapt the strategy sets we shall deduce for each of these types to different target populations within the same economy.

## CURRENT BLOCKAGES AND STRENGTHS OF EACH WORLD

For each type of rural world, the Laval group<sup>7</sup> ranked the five major weaknesses that block the dynamic realization of our four indicators of new world order (Table 2). In terms of *inefficiency*, the capitalist developed world suffers from low worker morale, the capitalist underdeveloped world from inappropriate technology, the socialist developed world from feather-bedding, the socialist underdeveloped world from poor markets and infrastructure, and the native world from lack of control over its natural resources. As to *inequity*, the First World is characterized by an excessive concentration of wealth and a resulting decline in community action, the socialist developed world by ethnic/religious civil war, the socialist underdeveloped world by massive regional poverty and the native world by lack of political voice. Still other factors lead to *disequilibrium*. For example, the capitalist developed world overemphasizes materialistic desires (as opposed to basic needs) and destabilizes the rest of the world with these values, the capitalist and socialist underdeveloped world suffers from demographic imbalances and a worsening land:person ratio, the socialist developed world is characterized by sector imbalances and the ensuing queues and black markets, and the native world suffers from high unemployment and resulting substance abuse. *Stagnation* may be largely attributed to an anti-ecological/anti-rural model of development in the capitalist developed world, the supranational nature of problems in the capitalist underdeveloped world, the imitation of ex-USSR culture and ideology in the socialist underdeveloped world, and the absence of marketing channels in the native world.

Fortunately, for every weakness in a given rural world of humanity, another world boasts a relative strength (last column, Table 2). Our group determined that the developed capitalist world could learn from native world traditions the ecological simplicity necessary for modifying GNP and redefining leading indicators and thus moving inward on the material/market axis and outward on the moral axis. It could learn from at least one country of the Third World (Costa Rica) to reallocate war resources to universal health care and improved educational systems and thus make a major adjustment along the state axis. It could learn from the socialist Third World to invest in publicity for moderating useless desires and promoting voluntary giving, and thus move outward on the gift/spirit axis. It could learn from the developed socialist world (notably the former Yugoslavia) to create functional 'demopoly' (for example, worker-managed firms) to reinforce outward movement on the moral axis and inward movement on the material axis.

Based on these results, Table 3 suggests the starting points and endpoints on the three axes of Figure 1 for each of the five worlds. It should be noted that these are *relative* goals. Absolute objectives and concrete strategies and poli-

**TABLE 2** *Weaknesses to be corrected in the transition and the worlds of strength in that regard*

Weakness	Rank	Worlds of strength
<i>Capitalist developed world ('energy-rich/time-poor')</i>		
Desires → needs, materialism, individualism, spread to rest of world	1	Native, socialist underdeveloped
Taylorism, workaholism, low worker morale, erosion of family	2	Native, capitalist underdeveloped
Concentration of lands/wealth	3	Native, socialist underdeveloped
Lack of worker management, community, collective aid, cooperation	4	Socialist devd., native, socialist underdeveloped
Anti-ecological/anti-rural development model	5	Native, capitalist underdeveloped
<i>Capitalist underdeveloped world ('time-rich/knowledge-poor')</i>		
Population explosion, man:land ratio too high	1	Capitalist developed, socialist developed
Low level of incomes	2	Capitalist developed
Lack chemical/mechanical/biological appropriate technology	3	Capitalist developed, socialist underdeveloped
Low productivity of lands and livestock	4	Capitalist developed
Supranational nature of problems, lack supranational structure	5	Native
<i>Socialist developed world ('space-rich/spirit-poor')</i>		
Feather-bedding, fear, lost spiritual traditions → stoicism, fatalism	1	Capitalist developed, native
Ethic/religious civil war, tribalism	2	Native, capitalist developed
Waste, pollution, overspecialization, lack of organic agriculture	3	Capitalist developed, native, socialist underdeveloped
Lack transport/input supply/markets → queues, black markets	4	Capitalist developed
Quantitative/production goods bias, lack management skill/vision	5	Native, capitalist developed

*Socialist underdeveloped world ('knowledge-rich/space-poor')*

Imitation of USSR culture/ideology → party power, inappropriate education	1	Capitalist developed, native
Lack transport/inputs/markets/price information → delays, consumer subsidies	2	Capitalist developed
Population explosion, man:land ratio too high, preference for sons	3	Capitalist developed, native
Waste due to inefficiency, industrial/urban pollution	4	Capitalist developed, native
Massive regional poverty but overinvestment in military	5	Native

*Native world ('spirit-rich/energy-poor')*

Lack of control over natural resources → pollution, destruction	1	Socialist underdeveloped
Alcoholism, drug dependency, violence	2	Socialist underdeveloped
High rate of unemployment	3	Socialist underdeveloped
Underdeveloped marketing channels → economic stagnation	4	Capitalist developed
Lack of political voice	5	Capitalist developed

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**TABLE 3**      *Starting and end points of transition*

Name of rural setting	Relative weight on		
	Market axis	State axis	Gift axis
Energy-rich/time-poor (e.g. USA)	0.6–0.5	0.3–0.1	0.1–0.4
Time-rich/knowledge-poor (e.g. Nepal)	0.3–0.3	0.4–0.1	0.3–0.6
Space-rich/spirit-poor (e.g. Georgia)	0.05–0.4	0.9–0.2	0.05–0.4
Knowledge-rich/space-poor (e.g. China)	0.2–0.3	0.6–0.1	0.2–0.6
Spirit-rich/energy-poor (e.g. the Inuit)	0.1–0.25	0.4–0.05	0.5–0.7

cies can only be arrived at by *tâtonnement* and collective consultation, as will be shown in the various paradigms of transition in the next section. Already we can see that the space-rich/spirit-poor world should not only reduce the role of the state and increase that of markets; it should also substantially increase the role of the non-state, non-market institutions of the gift/reciprocity axis. This implies a far more sophisticated recommendation for economic transition of the former Soviet bloc than simple mimicry of capitalist markets.

**PARADIGMS OF TRANSITION**

But wait: how does a society move along the arrows of Figure 1 to achieve these desirable endpoints? The current relative weakness of economics in addressing evolution sample paradigms from the ‘physics/ecology’ and ‘political science/sociology’ columns of Table 1 suggests transition concepts that may aid the development of sounder strategies of economic transition.

*Physics*

Economists still base their theories of production and exchange largely upon Clausius’s 1867 first law of thermodynamics: that matter and energy can neither be created nor destroyed; they can merely be transformed. But economists have largely neglected the second law of thermodynamics: that such a transformation is unidirectional, towards increasing lack of availability (or ‘entropy’). They have severely underestimated the waste and pollution which result from production processes apparently ‘efficient’ in the use of capital inputs and labour and machine time, but wasteful of non-renewable energy. The new world order must therefore foster a moderation of human desires for unnecessary goods. To reintegrate the second law of thermodynamics into economics and help guide the search for more appropriate production processes, the economist Robiati (1991) suggests that efficiency be defined as the minimum creation of entropy per unit of social necessity produced. This criterion could then replace or complement current measures of productive efficiency based only upon the first law.

But physics has progressed since 1867! The theory of chaos and complexity began with the quantum mechanics of Niels Bohr and more recently added electron 'tunnelling' in atomic physics and 'negative' energy in cosmology. Previous theories were not wrong, but special cases of limited applicability. Because Man is now understood to be inextricably involved in a universe that he cannot measure without changing, absolute objectivity no longer exists, and we will never know exactly where we are headed. Indeed, small chance events can provoke a major 'bifurcation' following long periods of stability. What is exciting about the application of this paradigm to society is that, although bifurcation can occur spontaneously as in physical systems, it can be accelerated or guided by a small group of well-meaning individuals who understand the paradigm. In agricultural economics, specialization, learning and cooperation ('coevolution') become strong tools for creating order. For the real question in chaos and complexity theory (and in economic transition) is one of process and not of final point. Complexity theory thus provides a potential escape hatch out of the second law of thermodynamics upon which the new world order could capitalize. But chaos and complexity theory also demonstrates that historical progress is non-linear, irreversible and unidirectional in time: society will have to get its transitions right the first time.

### *Economics*

Samuelson has proposed a sixfold classification of dynamic systems.<sup>8</sup> Very few have been explored. Not only were the dynamic–historical paradigms of Marx and Schumpeter vague and impressionistic, the static–stationary time-slices of neoclassical economics did not successfully eliminate the influence of time, which may explain such anomalies as backward-bending supply curves. Phelps's 'golden rule' of capital accumulation (that the marginal product of capital exactly equals exogenous labour growth) ignored other possible uses of output as ends in themselves. Similarly, von Neumann's maximal 'balanced growth' of all sectors in exactly the same proportion along a single ray failed to reflect a possible desire to consume relatively more luxury goods and comparatively fewer necessities as output expands.

To correct these inflexibilities, the turnpike theorem states that, when society plans for the long run, it may be most efficient to expand along a 'turnpike' approximating the optimal von Neumann path, even if non-proportional growth is desired. Although it takes society out of its way, the turnpike speeds up the journey for much of the distance to be travelled. An advantage of this paradigm is that it provides both a clear indicator of social progress – the speed at which the economy is moving – and added time for the society to consult upon its ultimate teleological priorities. A disadvantage is that society must accept in the short and medium runs second-best consumption patterns, which accumulate unwanted goods. Inasmuch as these goods can be bads (arms or noxious chemicals), there is a clear conflict between desired growth and Robiati's entropic efficiency.

Partly as a result, optimal control theory applications in economics have become increasingly fashionable. The goal is to model an existing economic

mechanism (a firm or the economy) with state and control variables, and then to calculate the trajectories of control parameters which optimally regulate it. Notably, a differential equation – called a *transition* equation – governs the movement of each state variable over time. The advantages of optimal control as a transition paradigm are that the performance index can be specified at will by the society, the critically determining initial conditions of chaos theory are explicitly included, transition is an integral part of the system and ecological constraints can reduce the production of unwanted goods.

Several recent innovations in optimal control make it more acceptable as a paradigm for guiding societal evolution. For example, Martos (1990) incorporated a non-price quantity adjustment mechanism inspired by Kornai's (1980) theory of 'anti-equilibrium'. This innovation makes his optimal control models particularly applicable to guiding transition amidst the frictions and delays inherent in the agrifood systems of the socialist and underdeveloped capitalist worlds. Holly and Hughes Hallett (1988) have further integrated rational expectations, risk aversion, specification of priorities and achievements, non-cooperative, full information dynamic games, incomplete information, bargaining, social optima and cooperation. In particular, this last area is promising for the evolution towards a new world order because non-cooperative games are socially inefficient.

### *Sociology*

Axelrod's (1984) studies into such game-theory dynamics show that, if the aim of social reorganization is to transform a world of Hobbesian 'meanies' into cooperators, mankind must play the right strategy, and often. Axelrod proposes the strategy 'tit for tat', whereby one starts with a positive overture but retaliates for any mean act ('defection'). Retaliation is, however, non-escalating, in that it is always at a lesser level than the aggression. 'Tit for tat' is thus 'nice, provokable, forgiving and clear', and wildly successful against competing game-theory strategies. Results from simulated 'tournaments' among players of such strategies demonstrated that, even in a world of defecting egoists without central authority, cooperation can evolve from small clusters of individuals who practise the reciprocity inherent in the third pole of Figure 1 and interact with each other at even a minimal level. Even less clustering is necessary when the interactions are expected to be of longer duration or the time discount factor is not as great. Axelrod's model suggests that a cooperative new world order can be promoted by recognizing defection, heavily weighting the future, changing the pay-offs, valuing unity in diversity and teaching people to care about the welfare of others. These results seem particularly applicable to the GATT negotiations and technical assistance programmes.

### *Political science*

One political science model of transition to the new world order is that of the United States Constitution. The founding fathers of the United States (Wash-

ington, Franklin and Madison) fortunately realized that there were too many conflicting views of the future (big v. little states, hierarchy v. equality, agriculture v. trade, and so on) for the Constitutional Convention to agree upon a once-for-all Platonic endpoint for US society. They therefore stressed the creation of an 'error-friendly' process for sustained evolution under imperfect information compatible with the theories of chaos and complexity in physics. The resulting marvel of adaptive planning and constant self-reorganization could perhaps serve today as a paradigm for the consultative exploration of pathways to a future supranational government composed of counterbalancing legislative, executive and judicial branches. This is all the more important in that many political scientists now believe that the nation-state is 'withering away' as a link between supranational and local governments.

### *A universal paradigm of transitions?*

Taken together, these paradigms of transition from several disciplines imply that some minimal level of *cooperation* and reciprocity is necessary for the positive evolution of any socioeconomic system, regardless of the starting and ending points of that transition; detached *consultation* among concerned parties is essential; *external information* from sources outside economics and outside the socioeconomic context of the world in question can also be profitably studied and endogenized; because one can never know exactly where one is going, adaptive walks and other forms of *tâtonnement* are an inherent part of responsive transition strategies; and *community* at the local (for example, village granaries) and international levels (for example, regional integration) will play an increasing role in successful transitions.

## GOALS OF THE TRANSITION BY WORLD

Each of the rural worlds of humanity has the choice of maintaining its current goals and practices (implying a strategy of inertia) or revising them (implying a conscious bifurcation in the manner suggested by Table 3). This choice often depends upon the perceived values of the system and the relative emphasis placed upon goals. For example, it could be argued that, while both China and the ex-USSR nations wish to increase the role of markets in their societies, a substantial transition towards capitalist developed values is seen as generally positive (efficiency, democracy) by ex-USSR nations but largely negative (turmoil, loss of women's rights, loss of culture, corruption, venality, fascism, lack of health care, ethnic turmoil) by the socialist underdeveloped world.

Table 4 divides these goals into those of the near future (1994–7) and the sustainable future (1998–2028). Similar to the turnpike hypothesis, the goals of the near future often differ in direction (or scope) from the long-term goals. In fact, strategies for the near and sustainable future may differ quite markedly. This fact points to the need to generalize to all four indicators of transition Kuznets's U-hypothesis on equity: that a country's income distribution may often have to get worse before it gets better.

**TABLE 4** *Goals, theories and strategies of the transition*

Goal	Theory	Strategies
<i>Capitalist developed world ('energy-rich/time-poor')</i>		
Reform curriculum, promote rural values	<i>Schultz, Jefferson</i>	<i>1994–1997</i> Transfer defence budget to education
Attract youth to agriculture and the rural sector	<i>Rawls</i>	Subsidies/loans to young farmers, publicity
Promote spontaneous cooperation	<i>Walras, Axelrod</i>	Budgets for groups
<i>1998–2025</i>		
Reduce erosion, loss of natural resources, pollution, disease	<i>Sachs, Robiati</i>	Redefine GNP, ecological accounting
Increase number of farms, employment per farm	<i>Kolm, Feder</i>	Close tax loopholes, limit land inheritance
Safer production technology → less danger, cancer, better diets	<i>Vanek, Georgescu-Roegen</i>	Demopoly, liberalize passports
	<i>Lappé</i>	Ban drug production, subsidize organic farming/ appropriate mechanization, publicity, health care reform
Revive rural communities	<i>Kolm, Wilkinson</i>	Rurality conferences, village granary
	<i>Sioui, Temple</i>	Research on native values
<i>Capitalist underdeveloped world ('time-rich/knowledge-poor')</i>		
<i>1994–1997</i>		
Develop locally appropriate technology	<i>Boserup</i>	Research institutes on local products
Improve market efficiency	<i>Hayami-Ruttan</i>	Price information service, retrain ex-bureaucrats and other unemployed
Control population growth	<i>Malthus</i>	Family planning, agricultural insurance
Favour emergence of self-help coops/demopolies	<i>Kolm, Walras, Vanek</i>	African-style tontines, savings coops
<i>1998–2025</i>		
Stop, reverse destruction of the environment	<i>Sachs, Robiati</i>	National parks run by minorities, moderate/spiritualize hunting, ecological accounting, World Resource Federation



Reduce size and corruption of the state Eliminate sex: class barriers in the economy	<i>Kornai</i> <i>Marx</i>	Sell arms to invest more in education and health Universal education for both sexes, credit to groups/ women
Improve income distribution Eliminate slums, improve access to land Get out of public debt, stabilize prices	<i>Gandhi</i> <i>Todaro</i> <i>Keynes</i> <i>Prebisch, Feder</i>	Food-for-work, village granaries, heavy inheritance tax Migration information service, rural industrialization Renegotiate debt, devalue currency, limit money supply Promote GATT, limit multinationals
Preserve traditional values and consumption	<i>Wilkinson</i>	Institutes for cultural pride, promote tourism
<i>Socialist developed world ('space-rich/spirit-poor')</i> Identify comparative advantage → balance of payments	<i>Ricardo, Helpman</i>	<i>1994–1997</i> Technical/management advice from other countries, price information Transport infrastructure, create a common market Transfer factories to countryside, contribute to international police force
Transfer military/industrial investment to education/job creation	<i>Mellor, Ranis-Fei</i>	Reform agricultural research, farm management associations, urban → rural migration, immigration from other worlds
Diversify, make the agricultural sector more efficient	<i>Hayami-Ruttan</i>	
Individual economic responsibility → hope, less alcoholism	<i>Schumpeter</i>	<i>1998–2025</i> Reduce bureaucracy, individual credit, job creation for ex-soldiers, bureaucrats, support poor Liberalize housing, ban production of drugs Post-Marx curriculum, promote demopoly Ecological accounting → subsidize non-polluting technology
Revive personal/collective spirituality, end racism Reduce rural pollution	<i>Walras, Gandhi, Vanek</i> <i>Sachs, Robiati</i>	Village granaries, eliminate food subsidies
Feed the population better, food security	<i>Sen</i>	
<i>Socialist underdeveloped world ('knowledge-rich/ space-poor')</i> Reduce arms budget, reduce consumer subsidies	<i>Lappé, Kornai</i>	<i>1994–1997</i> Promote consumer goods, liberalise housing Contribute to international police force

**TABLE 4** *continued*

Goal	Theory	Strategies
Reformulate education system, stop brain-drain	<i>Schultz/Schumpeter</i>	Permanent passports to returning scholars
Develop modern urban and industrial centres	<i>Mellor</i>	Replace Marx by Boulding
Integrate markets with best elements of socialism	<i>Kornai</i>	Heavy light industry based on agriculture, foreign trade 1998–2025
Preserve natural resources in fragile areas	<i>Sachs</i>	Agricultural insurance, income/sales tax, develop marketing channels
Improve the efficiency of production and distribution	<i>Kornai, Kolm</i>	Ecological accounting and taxation, diversify agricul- tural production
<i>Native world ('spirit-rich/energy-poor')</i>		Price information, unify currency, village as planning unit
Create employment → eliminate alcohol, violence	<i>Mellor</i> <i>Theology</i> <i>Theology</i> <i>Kolm, Vanek</i>	1994–1997 Use Western medicine, ban begging Tax cigarettes, alcohol Ban gambling
Increase per capita income → create capital reserves	<i>Eberstadt</i> <i>Ranis-Fei</i> <i>Myint</i>	Group investment, demopoly Off-reservation work, encourage savings Attract non-native investment Develop markets, publicize products
Preserve land and resources	<i>Robiati</i> <i>Sachs</i>	1998–2025 Promote organic agriculture, ecologize GNP
Liberate selves from developer exploitation	<i>Marx</i>	Ban, tax pollution
Maintain culture, language, economic lifestyle	<i>Axelrod</i> <i>Axelrod</i> <i>Wilkinson</i>	Publicize environmental protection Equalize the role of women Educate women and youth Courses/tours of native spirituality

## THEORIES AND STRATEGIES OF TRANSITION

Similarly to the goals of transition, the *theories* underlying the transition are often common to more than one world (second column of Table 4). The strategies of transition – how to make the passage between where the world of humanity is now and where it wants to go – flow deductively from these theories, some being general for all the worlds of humanity, others being specific to each. For example, many worlds wish to preserve their natural resources. The writings of Sachs (1980) and Robiati (1991) suggest that creating and joining a World Resource Federation, redefining GNP to take account of the ecological impact of cutting down a rain forest and taxing accordingly might be policies for any of the rural worlds of mankind. However, banning poaching and establishing national parks run by minority people might be particularly appropriate for the underdeveloped capitalist world; subsidizing non-polluting technology for the developed socialist world; and diversifying agricultural production for the underdeveloped socialist world.

The remarkable social scope of these rural-based strategies suggests that the rural sector, having been excessively reduced as a place of work in the two developed worlds and woefully neglected in the other three, must play an *increasingly* important role in guiding societal transitions in the near and sustainable futures.

## CONCLUSIONS AND SUGGESTIONS FOR FURTHER RESEARCH

### *Conclusions*

Six general conclusions flow from this research. First, there seems to exist a universal paradigm of transitions, both in the interdisciplinary sense and in terms of its applicability to all five worlds of humanity. Second, each world is in need of a major reorientation of its rural policies and/or the adoption of specific policies of transition. Third, the rural sector, having been neglected or reduced in size in most worlds, must play an *increasingly* important role in the near and sustainable futures. Fourth, the great complementarity among the five rural worlds of humanity creates the possibility of inter-world learning. Fifth, the preceding point demonstrates that agricultural economists can no longer accept that the energy-rich/time-poor world unilaterally determine values, goals and strategies for the rest of humanity. Sixth, because the constellation of goals in Table 4 still differs significantly by world, the two-way sharing among each pair of worlds will not lead to the homogenization of the world rural economy, but rather to a greater unity in diversity, as foreseen by Smith and Ricardo.

### *Testable hypotheses and questions for further research*

The deductive approach presented here may be used to generate hypotheses for future inductive, applied research on each world. Some of these hypotheses might be the following.

- (1) Planners in each of the five rural worlds of humanity have nominally espoused the *goals* deductively suggested by this paper.
- (2) However, no effective bifurcation of *policies* has as yet been undertaken in most countries.
- (3) As a result, the weaknesses identified are becoming more serious in most countries.
- (4) The recognized 'success stories' from each continent have adopted dynamic transition strategies similar to those suggested by deductive logic.
- (5) These success stories are directly transferable within the same world and indirectly suggestive of exportable principles to different worlds. As a partial test of these hypotheses, the remaining, inductive papers of this session will determine to what extent specific countries within the five rural worlds are following the transition strategies suggested by deductive logic. They will also show whether or not the success stories of each world have followed the idealised transition strategies suggested here.

## NOTES

<sup>1</sup>The Society for International Development declared in 1990: 'The main lesson should be a lesson of humility for we lack a general theory of development, particularly in periods of transition'.

<sup>2</sup>Adapted from Calkins, Larivière, Martin and Morasse, 'Measuring Well-being and Poverty', Meeting of the European Association of Agricultural Economists, Stuttgart, September 1992. This source discusses in detail the specific indicators which define each axis.

<sup>3</sup>This description of Walras draws repeatedly upon Jean Denizet (1981), 'Équilibre économique et sociale chez Walras', *Economie appliquée*, XXXIV, Geneva.

<sup>4</sup>For example, the *Guardian Weekly* of 14 November 1993 reported a study in which volunteers were given \$20, of which they could either keep \$18 and give away \$2 or keep \$10 and donate \$10 to other people. The choice was confidential. The vast majority (75 per cent) chose the latter option. Another example of this spontaneous willingness to create a reciprocal world is the success of non-paid blood banks in Canada.

<sup>5</sup>There will always be 'free-riders' in the system. But estimates of those who refuse to file or significantly cheat on income tax forms in North America suggest that the percentage is less than 15 per cent.

<sup>6</sup>We replace materials (which pre-exist spatially or are generated by the other factors) with Spirit in an attempt to capture the ethical and moral forces underlying spontaneous reciprocity and collective initiatives.

<sup>7</sup>The data for this classification and the subsequent analyses were derived from field studies in Canada, Burkina Faso, Nepal and China, as well as graduate student evaluations in an advanced development theory course.

<sup>8</sup>Much of the discussion in this paragraph and on the turnpike theorem is adapted from William J. Baumol (1970), *Economic Dynamics: An Introduction*, New York: Macmillan.

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