ENCOURAGING SYSTEMIC AWARENESS OF AGENTS IN ORDER FOR ECONOMIC TRANSFORMATION TO EVOLVE INTO A REPRODUCTIVE MECHANISM OF NEW RULES FORMATION

ABSTRACT

This paper explores the inter-relations between the key development factors which economic development literature indicates, by using exploratory factor analysis (EFA) of a dataset of 43 variables, spanning between 2017-2019, for 61 developed and developing countries. The aim is to apply systems thinking in the interpretation of results, under DSRP framework, in order to highlight structural patterns and evolutionary processes that are unified as an economic reproduction system. The guiding key proved to be the fundamental importance attributed to the innovators and entrepreneurs initiating and driving the process, being the social group that forms synergisms of multi-stakeholder networks, inducing inclusive decision-making and setting the rules for open, active involvement of new entrants. This political economy perspective creates the ground for theoretical concepts of creative destruction, economic transformation, transition, path creation and systemic innovation to be placed in an exploratory dialogue. The theoretical underpinnings lay in the field of new endogenous growth, being a platform for incorporating institutional economics, innovation system approach and complexity theory. With this lens, a structural sequence of strategic dynamism is detected, starting with institutional protection, leading to entrepreneurial culture instigation, enabling productive connections, leading to successful business practices and new mindsets. With bottom-up inclusiveness as the evolutionary motor, the emerging momentum tries to overcome the historical dependence of practices from old needs, altogether constituting a reproduction system of a new development life-cycle. The methodology produced eleven latent factors/performance indicators within four structural dimensions, integrated in a complex systemic framework that constitutes a holistic approach on economic development.

Keywords: transformation, inclusiveness, strategic dynamism, systems thinking, creative destruction

JEL Classifications: F43, 036, P11

1. Introduction

Modern theorizing of economic development starts with endogenous growth theory (Romer, 1986), whereby the emphasis is on the internal factors of productivity, being innovation capabilities and human capital advancement. The national innovation system framework followed (Freeman 1989), introducing the systemic aspect of the innovation process by incorporating the interplay between factors theorized by institutional economics (North 1990), being legal frameworks and governance structures among others, representing a transactions cost level. From this broadening of scope various concepts emerged, such as inclusive growth, equal opportunities and the growth prospects from transparent and accountable institutions. Adding the concept of entrepreneurship, with the evolutionary dynamics from

creative destruction (Schumpeter 1934), contributed to the completion of the holistic approach to economic development.

The next evolutionary step of this theoretical line of research can be achieved by drawing insights from sustainability transitions field (Göpel 2016) and exploiting its key methodological tools, being the Multi-level Perspective (MLP) on socio-technical transitions, and the Techno-economic Paradigm (TEP). Instead of treating economic development macroscopically and departmentally, through economic sectors, we can view it as the latent systemic substrate upon which specific systems of production, distribution and consumption are founded and fueled. The main difference with the socio-technical systems for the provision of energy, mobility, housing, communication, education, finance, etc., as TEP suggests, is that the proposed founding system highlights the level of institutional conditions within which productive capabilities emerge, needed for the above socio-technical systems. These conditions don't refer to specific configurations of agents, technologies and institutions, analyzed by MLP, but to the political and economic emergent factors that structure transactions and behaviors. These conditions, to the extent that they act together in networks of interactions, are the founding system's constituent parts.

The holistic approach on economic development can thus take the form of a measure of readiness and capability of the economy in undergoing necessary transitions and transformations. Under a biological reframing, economic development can be seen as a reproductive system, being an inter-functional network of factors that produce results and reproduces structures that shape the conditions within which agents act adaptively and creatively. This theoretical approach continues the research path that began with the connection of economic development with institutional economics and systemic innovation (Geels 2005). It is now the turn for economic transformation literature to form the basis for economic development to be understood as a complex adaptive system that copes with structural changes. The originality of the study lies in the attempt to combine two research directions, economic development as evolutionary institutionalism (Fürstenberg 2016) and economic transformation as a systemic transitioning process (Schot and Kanger, 2018), offering a path to their next evolutionary step towards a unified approach to economic development.

The next section attempts the theoretical mapping of the approaches that highlight different aspects from the holistic perspective of economic development, forming the base for the empirical studies, being listed descriptively and critically in the following section, opening the field for the design of the conceptual model of the current study, followed by its validation through statistical processing of empirical findings and their subsequent utilization for conceptual developments.

2. Literature Review

The three theoretical approaches can be merged in the space of strategic dynamism (Tamás 2011), or Strategic Niche Management (SNM) (Kemp, Schot et al. 1998), whereby legitimacy and effectiveness of transformative actions takes place, accounting for power structures. Strategy is the manoeuvre space for appraising and negotiating the trade-offs among interests and visions of different groups, seeking the selection of optimum pathways in terms of concentration of resources and buildup of capabilities (Schot and Steinmueller 2018). It is a complex and uncertain process, but

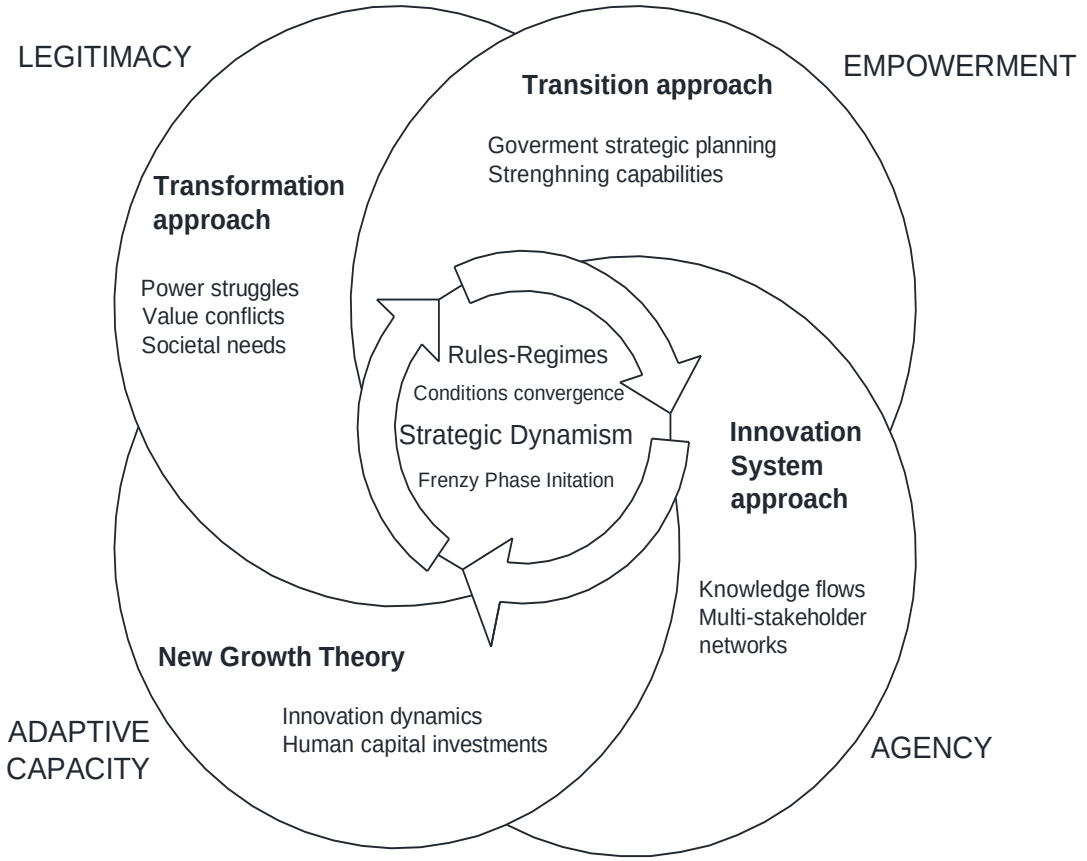
follows recurrent patterns and mechanisms, such as path dependency, emergence and thresholds. The goal is the enhancement of the power to transcend paradigms in an ever-transforming world. This involves the creative interplay between path dependency and path creation, alleviating transaction costs and stimulating drivers for goal-seeking. Failures of directionality, policy coordination, demand-articulation and reflexivity, describe the challenges when crossing these pathways.

The Deep Transition framework offers a theoretical basis of sustainability goals for interpreting transition stages, introducing the concept of portfolio of directionality, defined as 'the collection of all possible directions of development offered by existing niches, regimes, meta-regimes and industrial modernity at a given moment of time' (Schot and Kanger 2018). The resulting transition prospects encompass co-production of social, behavioral and technological change in an interrelated way, emphasizing the crucial work of specific actors in generating multi-regime and niche couplings, as well as de-couplings (Van der Vleuten 2018). The role of systemic intermediaries is also stressed for either creating momentum for socio-technical system change, or unlocking and opening up of regimes for weakening reproduction of their core elements (Kivimaa et al, 2019).. These systemic changes theoretically occur along three levels, being micro-level spaces in which radical innovations emerge (niches), relatively homogenized practices and institutions (regimes) and the exogenous environment (landscape) (Geels, 2005).

In order to avoid the above reductionism of breaking and simplifying the transitioning process into three separate processes, a change in the perception scale can be applied for transition to be viewed as a reproductive system functioning from a deeper and broader level. Utilizing systems thinking and under the DSRP framework (Cabrera and Cabrera 2019) – being the initials of Distinction, System, Relationships, Perspectives – the meso level of institutional preconditions constitutes a reproduction system of various hierarchical and lateral relations, structured by information, power/resource configurations and flows (Arnold and Wade 2015). Fulfilling the criteria of whole-part organizing (signifying System), around cause-effect feedback loops (signifying Relationship) and emergent behavior from element interconnections or flows (signifying Distinction), the reproductive aspect of the process is highlighted, which ends up in new cycle formation, exercising the freedom of decision making (signifying Perspective) and future shaping.

The difficulty in empirically verifying the Deep Transition framework can be attributed to the impossibility of planning the course of an entire economy. The coordination and interconnection of socio-technical systems on a common direction can never be absolute, alluding to the types of transformation failures mentioned above (Gosh et al, 2021). The major sustainability goals configure the planning procedures of central organizations, which nevertheless cannot impose a coordinated orchestration among all operational actors on specific tractions and timetables. The economy operates mostly in a complex, chaotic and uncoordinated way, bottom up (Brand 2016), and theoretical formations such as Deep Transition, simply signal signposts on a roadmap, giving indications of the course, the direction or the strategy, but not penetrating the substrate, providing interpretations of how and why. Thus the reproduction framework is more appropriate for incorporating the complexity of the interrelated processes.

Diagram 1. Schematic simulation of economic development as a reproduction system



Source: Own study

Reproductions occur under certain institutional preconditions of properties and emergent factors convergence, from a threshold onwards, inaugurating the acceleration/frenzy phase, or the quantum leap approach to transformation (Linnér and Wibeck 2020), whereby the transformational potentials come together in a dynamic state, following the seeding from the predevelopment period. This assumption is described in Deep Transition and Transformative Innovation Policy (TIP) (Palavicino, Matti, and Brodnik 2023). but without providing causal interpretations. Coordination, thus, first arises at the level of conditions contributing to gestation and birth, whereby all elements inter-correlate and create a reproductive system, a fertile ground for continuous reproduction, an explosion of leaps towards new mindsets, until the economy stabilizes into searching for a new footing. In conclusion, the principles under which a reproduction system can be simulated, should be organized around four dimensions: (a) creating legitimacy, (b) creating empowerment, (c) providing agency and (d) providing adaptive capacity to manoeuvre (Linnér and Wibeck 2021), illustrated in Diagram 1

3. Analysis of the results

The results established four dimensions of economic structures, coinciding with the four theoretical approaches of the conceptual model. The first dimension represents property rights and the political economy framework, alluding to governance and therefore to the transformation approach. The second dimension

refers to attitudes and transaction costs, alluding to policy and therefore to the transition approach. The third dimension represents the institutional framework of knowledge economy alluding to innovation approach and the fourth dimension refers to innovators, winners of the market who set new rules and shape the new production cycle, alluding to endogenous growth theory. The dimensions also correspond to the principles of the conceptual model, i.e. to legitimacy, empowerment, agency and capacity respectively.

Table 6 Correlations between factors

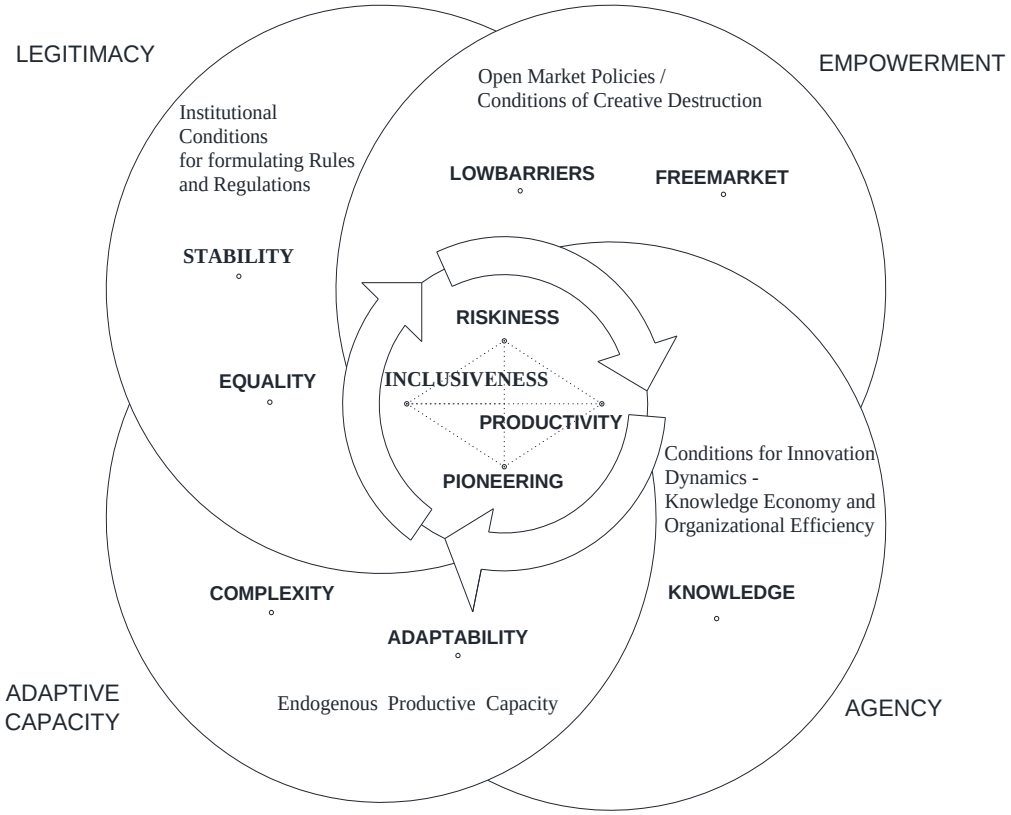
	Stab	Equal	Risk	LowB	FreeM	Prod.	Know	Pioneer	Complex	Adapt
Inclusiveness			0,833			0.778	0.494	0.800	-0.468	
Stability				0,455						
Equality					0.769					
Riskiness						0.836		0.821	-0.442	
FreeMarket					0.393					
LowBarriers							-0.442			
Productivity								0.695		
Knowledge								0.551		
Pioneering										
Complexity										-0.391
Adaptability										

Source: Own study

Further analyses of correlations between latent factors provide insights of the determinants of development, looking for justification of the existence of a certain evolutionary stage whereby reproduction conditions initiate the acceleration phase. Table 6 illustrates the correlation matrix between all factor pairwise comparisons, tabulating only the statistically significant correlations and those with a value greater than 0,4. It is found that only a few factors are positively inter-correlated to a statistically significant degree, but the dominant factors from each dimension are found to be inter-correlated with each other, namely Inclusiveness, Riskiness, Productivity and Pioneering.

These factor correlations reveal an inner common pattern found in all 61 economies that signify the close interconnection and coordination between the four development dimensions, and their respective theoretical approaches, under a common founding core, whereby the political economy of societal needs expression, identified by Inclusiveness, relates with creative destruction conditions of social practices, identified by Riskiness, as well as with the transaction cost level of the market, identified by Productivity, and finally with the innovation capabilities, identified by Pioneering, thus validating the conceptual model of Diagram 1, translated into a corresponding format illustrated in Diagram 2

Diagram 2 Mapping of latent factors within the Reproduction system



Source: Own study

These four theoretical approaches to economic development can thus be integrated, forming a reproduction system that is structured around four interrelated axes of institutional conditions and emergent factors. The statistical findings narrates that allowing for legitimacy within inter-governmental structures and providing empowerment from policy interventions, it will result in the emergence of multi-directional passageways for creative agency and of opportunities for growing multi-dimensional adaptive capacities. In other words, conditions of perceptual broadness and political plurality open up spaces for agents' interconnections, constituting a reproduction system of the emergence of a new productive cycle, translated into good performance in all development indicators.

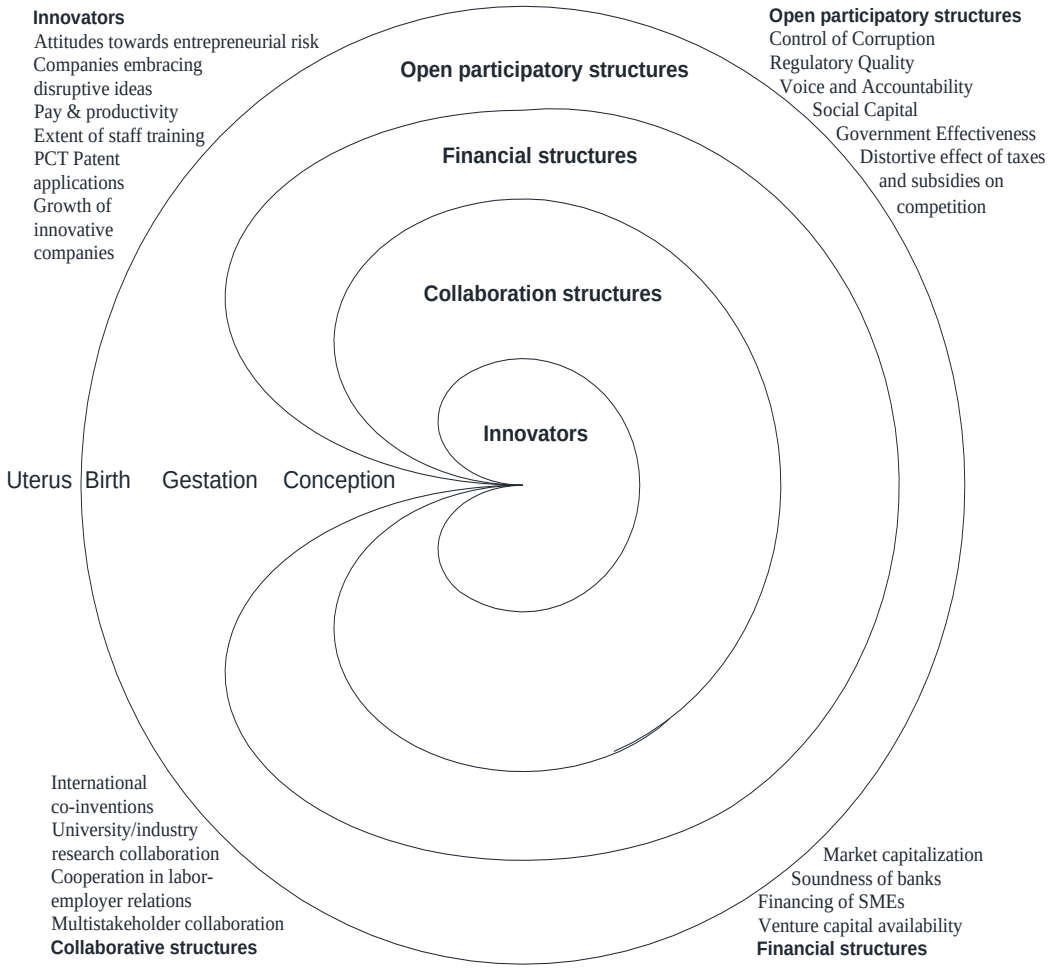
Discussion

The major statistical finding is that the four dominant latent factors are interconnected as a single lever. By shifting up the gearbox, the speed and pace of evolutionary dynamics increase, until a threshold is reached and reproduction/rebirth occurs. Some variables are the food other variables need, functioning as either transmitters or receivers, or as institutional inputs for emergent outputs. Some variables calibrate the reproductive system, strengthening the dynamics of bottom up processes. Altogether the four dimensions signify respectively the willingness, represented by participation structures, the open mentality, reflected by incentives, the connectivity from cooperative structures and the capabilities from innovation performance. The twenty variables behind the four dominant factors specify accurately these four sub-systemic processes, with their respective knowledge/information exchange nodes, indicating a broader area of their connection,

cooperation and union, providing system's coordination and efficiency, resembling in total the twelve Meadows' leverage points (Meadows 2008).

Considering the variables categorization according to these sub-systemic processes, illustrated in diagram 3, they can obtain a more descriptive title, namely open participatory structures, financial structures, collaboration structures and innovators. Diagram 3 shows the arrangement of the above structures in an organic format that refers to a uterus of institutional preconditions, within which conceptions occurs, followed by gestation and subsequent birth, uterus being the economy that is either fertile or sterile when utilization of an evolutionary potential is attempted into forging a whole new paradigm. An economy becomes fertile when it distills and inspires trust to all motivated actors, good practices of cooperation, the urge to take responsibility, thus providing strong momentum to any transformative undertaking. In case of conception, the economy should be able to hold it, nourish it, gestate it, as a source of encouragement for establishing relationships and connections, so that conception leads to birth of innovative pathways and not miscarriage of capabilities and talents.

Diagram 3 Mapping internal structural layers within the Reproduction system



Source: Own study

The economy is the body, the set of institutional conditions and resources, in which the mind and the heart reside, where the mind is the design ways of utilizing and uniting the creative pieces of the material fabric of the economy and the heart is the space of creative synapses during the phase where the economy is pregnant, having been cultivated and opened from creative destruction, in which the old dominant regimes that encompass the creative dispositions of the actors are deconstructed, leaving no room for the visioning of new directions, perceptions and experimentations. Creative destruction gnaws away at the dominant trends, which only care about specific goals, yielding super profits to large corporate units, finally allowing a broader space with appropriate conditions to emerge, the space of the heart, so that motivated actors can begin to establish cooperative relationships, utilizing the resources of the economy under their strategic thinking, which underpin their values and beliefs.

Conclusions

Using meta-cognition of DSRP systemic thinking, one can simulate the economy as a reproductive system with a uterus and feeding mechanisms that nourish and gestate the fetus, which grows and evolves until is born and emerge complete into society, ready to cause effects and bring about change, or else be aborted and lost. In the fetus's position are the innovators, being motivated agents in their own field of interest, having diagnosed business opportunities or needs, but also capable of diagnosing broader context developments that lead into trend creation affecting the economy as a whole.

This is the context in which the four theoretical approaches to economics, which interpret the economy from different perspectives, converge. The transformation approach focuses on the internal motivations of actors integrated into the productive system. The transition approach is placed within the conditions of creative destruction with which innovators interact. The systemic innovation approach analyzes the extent of complexity formed by the relationships and interconnections of productive actors and the endogenous growth approach analyzes macroscopically the changes in productivity and technology, resulting from endogenously developing skills.

These perspectives converge on the fact that the economy is pregnant and does not evolve linearly or deterministically, on the basis of specific imperatives of sustainability and environmental needs, on prescribed tracks where niche socio-technical systems gradually become regimes, causing couplings and decouplings. On the contrary, it evolves around the actions of motivated innovators, to the extent that their undertakings concern more citizens, provoking their participation and thus promoting bottom up inclusiveness, as opposed to top down inclusiveness that emanates from governmental organizations.

Innovators, utilizing meta-cognition, perceive the economy as a reproductive system that involves agents with different perspectives, opinions, needs and metal worldviews. By performing broader situation analysis, they explore ways and create trends that could activate most of them. The conditions for innovators to be active are the four converging factors that the statistical analyses revealed, being Productivity, Inclusiveness, Riskiness and Pioneering, with the twenty variables that align behind them. Each of the factors feeds the other three simultaneously, with their measurable

variables creating the matrix of the complementary internal layers that provide resources, like capital, interconnection, knowhow, mentoring, networking, support, motivation, reflexivity, etc. This framework constitutes strategic dynamism, being the efforts to coordinate individual dynamics and ventures of different perspectives.

In conclusion, the statistical and conceptual results of the study place reproduction/rebirth as the authentic turn of the evolutionary trajectory of the economy, based on real needs and goals arisen from democratic processes, which reinforces collective self-confidence in daring to walk the path that highlights economy's own values and beliefs, without imitation or seeking to become a perfect copy of a foreign model.

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