Fast, Slow, and Endless Variation Drives Global Development

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Abstract

The narrative of modernization that links a country's receptivity to liberal democracy with its upward economic mobility pervades political economy analysis. Yet as many nations industrialize, urbanize, and prosper, their populations resist the idea that liberal political values are global "best practices." A possible explanation resides in the examination of "niche construction" and the "multiplier effects" that new niches trigger across densely connected and interdependent ecosystems. As in nature, the networks of increasing interdependence across societies produce selection processes (microevolution) that lead to diversity; populations protect their niches by discovering opportunities to limit or circumvent competition, to create or prevent novelty, to permit even suboptimal traits (predation and parasitism, for example) to proliferate. Societies that survive are well adapted to their environment—their microevolution employs specializations, diverse adaptations, and strategies, not the most optimized or most finely tuned institutions. Also as in nature, the multiplier effects of diversity can influence macroevolutionary change at the system level.

Introduction: Soaring Economies, Lagging Polities

Trouble looms for the global stability theory that links market economics and democratic convergence. Many and varied events, behaviors, and relationships in global political economy do not fall into line with either popular models of globalization or with scholarly models—the "end of history," for example, or modernization theory—that link income convergence with

political development. Racing economies are producing lagging polities, and this makes globalization harder to manage. If these trends continue, the system that has underpinned global stability since the end of the Second World War may be in danger of collapse.

The narrative of modernization that links a country's receptivity to liberal democracy with its upward economic mobility is pervasive in political economy analysis of transition. Noble laureate Douglass North and coauthors John Wallace, and Barry Weingast argue that political and economic institutions not in equilibrium will rebalance if economic openness moves too far ahead of political openness, that "open access in either economics or politics can be sustained only by the double balance of open access in both systems" (North et al. 2009, p.230).[1] This presumption—that a general law, which they name the "law of double balance," exists to bring errant polities in line with economic growth in order to create a sustainable equilibrium—overplays the role of convergence in their interpretations of economic growth, regime transition, state-building, and democracy.

Economist Daron Acemoğlu and political scientist James Robinson, in *Why Nations Fail* identify their own "iron law" of democratic and economic convergence. Their assessment of why some countries prosper while others stagnate shares with North et al. a conviction that the convergence of political and economic values is an absolute prerequisite for the effective modernization of societies (Acemoglu & Robinson 2012, pp.429–430). Acemoğlu and Robinson assert that without democratic reform, "Chinese growth is likely to end, … history and our

[1] "Open access systems are characterized by open political and economic competition, rather than the limited political and economic privileges enjoyed solely by elites in natural states. Open access states provide the basis for thriving markets and hence long-term economic development over many generations" (North et al., 2009).

theory suggest that growth with creative destruction and true innovation will not arrive, and the spectacular growth rates in China will slowly evaporate" (442). China's efforts to modernize will end like those of the former Soviet Union is their prediction (441).

The "iron law" that keeps economic and political development in equilibrium, however, did not apply in the most impressive contemporary examples of high-speed economic growth since 1960: the newly industrialized East Asian nations.[2] A significant *external* impetus for convergence drove the once-authoritarian East Asians to yield to history's iron law by acceding to democracy. East Asia's high performers all depended on access to a principal trading partner, and a principal source of military security, the United States, who emphasized the transition to democracy as a precondition for normal trading relations. Moreover the US could withdraw its security umbrella from governments considered illegitimate in the absence of electoral democracy.

This paper attests that the analytical conventions of contemporary political economy significantly misrepresent how the degree of interrelatedness within the system of international relations affects patterns of institutional and social transition. It concludes that the expectations of parallel or balanced development between political and economic institutions are unjustified,

[2] Asia's development trajectory since 1949 refutes the proposition of democratic and economic convergence. Contemporary India has underperformed its neighbors to the east. The East Asian Tigers have a long history of authoritarianism; only Japan held elections during its growth surge, and it has nevertheless re-elected the same party for the entire four decades of high growth. China achieved twenty years of continuous high-speed growth as a one-party state without elections.

and calls for a reconsideration of the widely accredited conventions of social science that support it.

The Death of Convergence

After recent decades of hyper-connectivity—in trade, communications, services, and ideas—economies in the developing world soared. But their polities are not keeping pace.[3] Comparative politics, the branch of political science that evaluates the differences among the politics of countries, is rich in case studies of illiberal governance and practices that persist among some of the most effective economic globalizers. So-called "hybrid regimes," in which electoral competition coexists with authoritarian tendencies, are thriving. The underlying societal dynamics of these regimes remains closer to the autocracies they once were than to the liberal states it is hoped they would become.[4]

A frequent topic within comparative politics is premature convergence, when economic liberalism outpaces political liberalism. In China and Turkey, two of the most successful and

[3] The notion of an optimal end point or best practice enjoys paradigmatic status in Francis Fukuyama's "end of history" narrative, first published in 1989. Twenty-five years later, in a 2014 essay written for the *Wall Street Journal*, he continues to maintain that when societies "get up the escalator of industrialization," they will attain "some version of liberal democracy" (Fukuyama 2014). He argues for convergence as both the process and the end point of global development

[4] Literature on hybrid democracy is mushrooming; see (Allina-Pisano 2008; Bowornwathana 2007; Chu et al. 2008; Connors 2002; Connors 2009; D'Anieri 2014; Farrelly 2013; Kurlantzick 2013; Levitsky & Way 2010; Morlino 2011; Norton 2012; Olcott 2002; Schedler 2002).

open economies in the emerging world, the relationship between markets and participatory democracy is complex. Both countries embrace classical liberalism's ideal of complex economic interdependence, but opening the economy does not unbolt repressive political norms, communal behaviors, and informal rules.

The middle classes of the emerging world are not evolving in conformity with the models of balanced political and economic development.[5] Rapid income catch-up among the fastest-growing economies, China, India, Russia, Saudi Arabia, and South Africa, is producing a common material civilization, but not a global middle class with a common outlook in matters like individual rights or the role of the state.[6]

The spectacular increase in the size of the global middle class between 2005 and 2014 has created few new democracies. During this period, when the unprecedented prosperity of emerging markets produced the highest income convergence ever recorded, global democracy

[5] In Asia, a negative correlation exists between income convergence and democracy. In the transition economies of the former Soviet Union, income convergence has no demonstrable effect on democratic values. In Latin America, a positive correlation reflects the political influence of a very powerful neighbor. In Europe there is convergence, largely due to the robust pull of EU membership. In Africa, a positive correlation is observable, but difficult to interpret. See (Próchniak & Bartosz 2014).

[6] Microeconomic "growth models" typically hold modernization and political reform to be hostage to the rise of living standards. When one stagnates, the other will fall behind. In this view, the only way to prevent countries from getting stuck in transition is to speed up economic growth.

indicators actually receded, and the two most frequently used indexes to track it downgraded the democratic status of many emerging nations.[7]

In East Asia, South Korea, Taiwan, Indonesia, and the Philippines have consolidated democratic transitions in the sense that successive governments are selected by universal suffrage, but this masks a failure to develop supporting institutions for accountable and transparent governance. Platforms for civic engagement between elections have not been established; after elections, only a tiny minority participates in politics. Without permanent, impersonal, or egalitarian political parties, the population lacks viable channels to mobilize,

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[7] Monty Marshall and Benjamin Cole in the *Global Report of Polity IV* (Marshall & Cole 2011, p.12) refer to these hybrids as "anocracies": "During the early 1990s, the number of democracies increased by thirty (30) in five years (from 48 in 1989 to 77 in 1994). There was a similar increase in the number of incomplete transitions toward democracy, as the number of anocracies rose from twenty-nine (29) to forty-eight (48); that number has remained fairly constant through 2011". They also report that in the two decades between 1980 and 2000, democracy made uninterrupted progress, but since 2000, the pattern has not continued (Marshall & Cole 2011, p. 10).

Democratic reversals are rare, but transition does not ensure progress toward liberal democracy. Although regressions to autocracy are infrequent, many countries that retain the outward appearance of being democratic by holding elections do not offer citizens the right to express and organize freely, nor do they provide such institutions as an independent judiciary to protect the freedoms that go along with the right to vote. (Freedon House 2014) identified 2013 as the eighth consecutive year in which freedom had lost ground. Between 2005 and 2010, backsliders exceeded the number of states in which democracy expanded.

voice grievances, or apply pressure for reform. These regimes seem more hybrid than democratic, observe (Giovanna et al. 2014), after completing the most comprehensive survey of their institutional evolution.

The populations of the Philippines, Nigeria, and India actively participate in elections as their economies lift off. Here, where formal governance institutions have been "transplanted," home-grown solutions to local problems persist that replicate preexisting social contexts and enable patrimonial beliefs, preferences, and interests to unseat liberal agendas. Income convergence enables both China and Russia to project their national interests globally, while gratifying demands for cultural authenticity and self-expression at home. In both countries, the fear that Westernization will dissolve the social ties that hold society together motivates efforts to bolster local cultural values.

Why are emerging nations not following the sequencing of previous transitions that occurred in the West? Why, when economies are soaring—as they industrialize, urbanize, and prosper—are the polities they support stubbornly resisting movement in the liberal direction, toward individualist social values, driven by the drive of the growing middle classes to seek greater self-expression? Are these divergences from the anticipated dynamics of economic and political transitions only temporary?

Linking the Science of Complex Adaptive Systems with Social Sciences

In seeking a deeper understanding of how social actors interact with each other and with their environment, and how, from such interactions, macro-scale phenomena emerge, we will follow the lead of (Simon 1969; Epstein & Axtell 1996; Axelrod 1997; Axelrod & Cohen 2001; Jervis 1998; Holland 1975; Holland 2014; Kauffman 1995), among many other scholars who are

exploring how complexity arises in social relations and how social organizations are networks that function as complex, adaptive, integrated, multilevel systems.[8]

In the study of social systems as multilevel systems, a change at one level alters the options for change at another, and so on. The individual agents that populate the system constantly adapt; they acquire new characteristics and adjust their behaviors to new sets of rules and to the expected reactions of others, making it difficult to predict the behaviors of individuals in constantly shifting environments and organizational formations. At each level, the constituents are likely to exhibit new behaviors, and how they adapt and act together will create the behavior of the whole. A change to one of the parts will change the behaviors of the remaining components.

After an overview of two of the emerging world's fastest-growing open economies, Turkey and China, we turn to the concept of "niche construction" for a theoretical framework that matches the process of institutional change in contemporary political economy. A discussion of fitness landscapes follows that leads into an evolutionary approach to agent cognition. The conclusion offers a reassessment of the behavioral principles underpinning agent cognition, or rationality, and collective learning in complex social environments, with speculation about implications for global development policy. Understanding and being able to harness the

[8] The study of complexity systems is a cross-disciplinary enterprise that seeks to understand how order emerges in complex adaptive nonlinear systems, i.e., how environments and their constituent parts continuously adapt to and transform one another. Complex systems are found everywhere in nature, from rain forests and ant colonies to ocean waves and birds in flight. In the social ecosystem, complex systems include families, neighborhoods, cities, markets, political parties, social institutions, the state itself.

adaptive capacity of agents to *self-organize* into new forms, more compatible with their changing environments, offers global policy a range of new options.

Turkey and China Search for Cultural Authenticity

Turkey and China are two star performers in the global economy, with growth rates that remain unsurpassed in their respective regions. Both have followed the path of trade openness to become highly integrated into the global economy, but without an equally rapid pace of political reforms. Economic growth gives both Turkey and China greater freedom to exercise local preferences and parochial identities. Their development reveals how, in the tangled order of the world today, there are many layers of connections, including symbiotic ones between liberal economies and illiberal polities and policies.

Turkey's Economic Convergence and the Resurrection of Communal Values

Contemporary Turkey is the quintessential market state. It trades with all partners, regardless of ideology, religion, culture, or geopolitical alignment (Kirişci 2009). In its dash for growth across the four decades, Turkey has embraced privatization and economic openness with a vengeance, with trade increasing from 17 percent of GDP in 1980 to roughly 50 percent in 2010. Nevertheless, economic growth goes hand in hand with the drift of its democracy toward authoritarianism.[9]

Its economic transition into the liberal world order has not led toward a shared conception of international society with its trading partners to the West. Yet rapid economic growth is not

[9] After a period of rapid acceleration, electoral losses in the 2015 parliamentary elections have slowed that drift. At the time of writing Recep Tayyip Erdogan's belligerence toward Kurdish independence is an effort to regain the momentum.

producing parallel social modernization in Turkey, and does not align Turkey with liberal internationalist objectives of judicial independence, human rights, separation of church and state, regulatory transparency, or checks on the power of government. Turkish political scientists E. Fuat Keyman and Berrin Koyuncu (Keyman & Koyuncu 2005, pp.108–109)write:

"The last two decades have brought about a fundamental change in Turkish modernity, and have also created a "paradox" in Turkish society, a paradox that has not yet been solved. This paradox finds its meaning in the simultaneous development of the "increasing dominance of economic liberalization" in economic life, whose laws of motion are, to a large extent, dictated by economic globalization that is the economic logic of Western modernity, and the emergence of the politics of identity/recognition (self-organization) that has taken different forms, such as the resurgence of Islam, the Kurdish question, and the liberal claims to rights and freedoms, all of which have become powerful actors in Turkish social and political life. In other words, the formation of Turkish modernity since the 1980s has been increasingly marked by the co-existence of economic liberalization and the resurgence of traditionalism and its appeal to the "return of authenticity"

Turkey's successful integration into global trading networks has roused the country's intellectual elites, the Westward-looking modernists, as well as the traditionalists, to affirm their commitment to Islamic identity and culture. This religious awakening has occurred as its culture embraces commercialization. The belief that gratification of economic and physical security will lead to greater emphasis on self-expression and cultural identity does little to explain Turkey's trajectory.

Transformation to an open economy has produced paradoxical political tendencies in Turkey. This opening began in the 1980s, when then Prime Minister Turgut Özal (1983–1989)

became the first holder of that office to make the pilgrimage to Mecca. Özal, who later served as president (1989–1993, as leader of the center-right Motherland Party), initiated trade and finance reforms that resulted in the creation of a specifically Islamic business network (in a country that had effectively made secularism a state religion).

The domestic debt market he created offered opportunities for business and integrated the rural migrants into urban society. These networks supported the rise to power of the religiously conservative, but economically liberal APK and its leader, Recep Tayyip Erdoğan. To become a full-fledged member of the European Union, an important piece of the economic program, APK had to increase its democratic credentials and ensure European standards for free and fair elections and this has restrained the party's authoritarian tendencies.

The emergence of a new business class changed the domestic political landscape as it enabled a larger percentage of the population to engage in trade and finance, and empowered a large interest group, religious Muslims, to increase its voice in national politics. (Erman 2001, pp.9–10) explains, "Once marginal, they had become an indispensable component of the economy … the shanties they once lived in were replaced by relatively well-built single-family dwellings," changing the position of the newcomers in the city. They began to challenge the center-right coalition and secular republican synthesis that had allowed a Turkish nation to emerge from the ruins of the Ottoman Empire. An alliance of Islam with pro-business interests, especially the business elite in the nation's capital, which had been moved from Istanbul to Anatolia by Mustafa Kemal Ataturk decades earlier, ironically helped initiate the collapse of the center-right. It remained for the APK to integrate this group into the political process.

The paradox of Turkey's modernization is that the IMF reforms opening the financial system did lead to democracy, but not the kind of democracy the West had in mind. Istanbul's

secular middle classes clash with their more devout brethren from the small towns. Prosperity and globalization produced a growing Islamic-focused polity and an idealization of its past as the center of a multiethnic Islamic empire. In that idealized past, a Turkish empire that reached from Azerbaijan to Spain had the political and military capacity to protect the faithful.

The conservative, communal leanings of the Turkish populations have been duplicated elsewhere in states with burgeoning upwardly mobile populations. And a new type of populist leader—Thaksin Shinawatra in Thailand, Hugo Chávez in Venezuela, Evo Morales in Bolivia, and Mahinda Rajapaksa in Sri Lanka—has stoked populist conceptions of national identity and promised to chart courses more aligned with popular interests and tastes rather than imitating the behavior and rules of their dominant trading partners. Trade routes themselves are changing. Globalization is perpetuating the "rule of variety," diverting resources away from globalized elites into the hands of traditional communities that seek their own synthesis of modernization.

Since opening its economy, Turkey's has become a harbinger of a new political reality, one in which emerging economies can adopt the methods of growth used in the West without adopting Western values or foreign policies. It should not surprise that the regime changes forced by the Arab Spring of 2010 are unlikely to lead to liberal convergence, either. Rather, democracy in the Middle East restores cultural values that are likely to be as alien to the West as those exhibited by the previous generation of unelected autocrats (Trager 2011).[5] New regimes need not play by the West's rules just because they are democratic.

China's Parallel Path to Modernity: Bureaucratic Inclusiveness as an Answer to Liberal Democracy

Like Turkey's, China's search for political and cultural authenticity is enabled by its success at integrating its economy into global markets. China's economy is soaring and its political norms are adapting to its global economic role—but in ways that have little in common with liberal conceptions of democratic pluralism. In its search for political authenticity, China has responded to liberal democracy with bureaucratic inclusiveness.

After China became a market economy, its bureaucracy underwent a huge expansion; membership in the Communist Party mushroomed from 40 million to 80 million. The party seeks to neutralize the threat of a rising bourgeoisie by building up a professional class with a vested interest in the status quo. The solution is not to terminate one-party rule, but rather to make the existing institutional structure of government more inclusive. The art of governance resides in controlling the bureaucracy and ensuring that all private interests and interest groups are subordinate to the state. China's Communist Party seeks inclusiveness by integrating key economic actors within the state to avoid negotiating with any powerful independent group. It is a strategy derived from a heritage that is rich in governance alternatives that can forestall democracy for long periods of time.

Today the party follows rules that reduce political selection in the recruitment of senior administrators and reward the performance of effective managers. It seeks to become even more inclusive by encouraging successful entrepreneurs to join it, and by offering commercial

opportunities it alone controls. The goal is to align the interests of the most capable managers and the top graduates with the interests of the state, thereby weakening demands for pluralism.[10]

The word "autocracy" does little justice to the complexity of governance in China after Deng, but neither does the word "democracy." The party's most important decision-making body, the Politburo, is meritocratic by the standards of most developing nations, although party elders, mostly former leaders, make many key decisions behind closed doors. Of twenty-five Politburo members, seven are scions of previous members, but the rest are appointments that result from a highly competitive process. The party attracts the top graduates from China's best universities, making it far more meritocratic than the power elites of virtually any other developing nation, including India. This policy is winning widespread acceptance from the new middle class. Formed after opening China's economy in the late 1970s, it identifies the country's prosperity with state-led economic development. Not surprisingly then, the upwardly mobile place a premium on absorption into the one-party state.

Yet the tradition of incorporating the most talented managers into the state structure goes back more than a thousand years, to the bureaucratic exam system of imperial times.[11] Chinese history offers a rich playbook to ensure continuity of one-party rule and avoid being a victim of

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[10] China's trajectory has a resemblance to Germany's on the eve of the twentieth century. Both regimes sought to substitute bureaucratic inclusiveness for multiparty elections. Imperial Germany opened its bureaucracy to ambitious and capable people of lower rank. Hoping to stem demands for an electoral franchise, it undertook sweeping political and military reforms that democratized social access to essential state institutions.

[11] The civil service examination system began during the Sui dynasty (581–618 CE), continued to develop through the Qing dynasty (1644–1912).

the "end of history." Historians Jiang Qing and Jisi Wang explain that China's evolution will be strongly dependent on a menu of options rooted in the nation's Confucian texts and heritage, and that its development model will provide other non-Western societies an alternative to Western democracy more aligned with traditional notions of meritocracy and social justice (Qing 2012; Wang & Kuhn 2012). Traditional Confucian concepts of dignity and self-worth are derived from living harmoniously in a social hierarchy where uniformity and common ideals are more important than self-expression and originality.

The singularity of China's political trajectory is unlikely to dissipate, despite its economic success in imitating Western formats of manufacturing. Success in the economic sphere enables China to pursue authentic self-expression in political belief and action. Having acquired the capacity to compete with the West in factory production, transportation, and munitions, China seeks to resist further pressures to adapt its social system to Western formats.

Adaptiveness need only go far enough to protect China's political and strategic autonomy so that it can defend itself from outside intervention. Having narrowed the West's lead in economic development, China wants to avoid political innovations that might disrupt its stable upward economic trajectory. Its trajectory suggests that political and economic development need not occur at the same rate or end in the same place.

The political evolutions of Turkish and Chinese society after their embrace of global markets suggest that a global political economy powered by accelerated interconnectivity is unlikely to obey the "iron law" of double balance in which all societies converge toward a common or optimal set of institutions. We now begin to search inductively for a relevant and justifiable theoretical treatment that fits our observations.

Institutional Adaptation via Niche Construction Produces Global Development via Variation

A critical question for contemporary global policy is what happens when interconnectivity intensifies.[12] In Turkey and China, experience with open markets amplified divergence and specialization in a way that is consistent with the logic of niche construction theory in evolutionary biology. The theory explores how each population (genotype, species, or ecology) survives by investing its surplus into creating or defending its own niche, that specific set of biological traits that enable it to exploit the resources of the environment (Odling-Smee et al. 2003).[13] To redesign or protect their local environment to suit their own specific requirements, populations select different paths to their survival in a shared environment through niche construction.

In densely connected ecosystems, the number of genotypes or species that can thrive in a particular environment is likely to increase. Connectivity increases the opportunities for populations to form alliances to either limit or circumvent direct competition. Thus the density of connectivity works in opposition to the logic of convergence toward optimal designs. It enables populations to gain options to either create or prevent novelty via alliances among less complex

[12] On connectivity and diversity in evolutionary biology, see (Sibani & Jensen 2013).

[13] In global economics, an analogy will be South Korea's large, export-oriented *chaebols* that arose locally and naturally from within the social structures of pre-modern Korea. These conglomerates exemplify how a country can attain global competiveness by strengthening its local institutional uniqueness. A number of institutional and cultural preconditions existed that allowed the deployment of surplus revenues from oligopolistic competition at home, to be channeled into competitive strategies and products desired globally.

partners, allowing diverse and even suboptimal traits to persist and proliferate. Populations survive because they are well adapted to an environment rather than because they represent the most optimized or best set of institutional arrangements.[14] Variation —predation, parasitism, or symbiosis—is how nature ensures ecological resilience.

An important implication of niche construction theory is that local resource distribution in an ecosystem alters the subsequent evolution of the ecosystem as a whole, and that developmental processes within a population (microevolution) can influence evolutionary change at a system level (macroevolution).[15] As connectivity increases, and adaptations proliferate, each additional niche can foster the possibility of new sets of interactions and exchanges. There is a "multiplier effect" that encourages new specializations and refinement of existing strategies, organizations, and institutions. Thus, in nature-made environments, wasteful or suboptimal strategies are actually viable, and may even stabilize the larger system.

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[14] (Lawson et al. 2006)is that as increasing numbers of groups with well-separated traits compete for resources, they must all adapt strategies and devise niches in which they can survive. But while heightened interconnectivity might offer an individual genome an opportunity to increase its fitness by copying a higher order example, a successful species more easily attains its survival by protecting its niche, rather than by copying the strategy of another.

[15] Friedrich Hayek's Nobel acceptance speech of 1974 criticizes reductionist methods, arguing that an economy is an "organized complexity" that depends on the "manner in which the individual elements are connected with each other;" knowledge of the properties of an individual agent is insufficient. Hayek called for models made up a large number of variables (Hayek 1989, p.4).

The Multiplier Effect of Niche Specialization

This notion that adaptation at a local level can result in novelty at the system level has been exploited by John Holland (Holland 1995; Holland 1998), a computer scientist, and Stuart Kauffman, an evolutionary biologist, founding members of the Santa Fe school of complexity, to explain how developmental processes within a single industry can trigger macroevolutionary change, such as the Industrial Revolution. Kauffman believes "new species of molecules, or goods and services, afford niches for yet further new species, which are awakened into existence in an explosion of possibilities" (Kauffman 1993, p.395) and the "novel molecules produced in one venue ultimately impinge on another and afford the possibility of novel reactions leading to a further increased diversity" (Kauffman 1993, p.393). The "nodes" of interconnectivity foster an increasing number of intersections with the potential to ignite create that "explosion of possibilities" that increases the abundance of new types (Kauffman 1995, pp.27–28).

It follows from this logic that as the interrelatedness associated with globalization increases market size, novelty arises via competition among many players for resources, and this will drive adaptation toward specialization and variation, creating new capabilities that in turn introduce new strategic options. As market size increases, niche construction by one firm or industry seeking to alter its environment to its own specifications will create new adaptive possibilities, organizations, and institutions.

But this developmental sequence of growth in nature-made ecosystems differs from growth as depicted in microeconomic theory. Yes, in both the number of interactions accelerates growth. But nature prefers variation to grow the system rather than designing a single optimal variant. Each species that secures a niche creates evolutionary space for others to find new

strategies for their own survival. The most favorable strategy for evolution is not to delete variety, but to *increase* it.

Microeconomics postulates a contrary view, that competition in a market with many players will promote convergence toward a single set of optimized goods, and that growth occurs as more efficient social technologies, institutions, regulations, or firms *supplant* variations that are less efficient at providing the market—consumers or regimes—with the optimized products it demands. Thus, in this view, convergence toward efficiencies eliminates deviations from "best practice," leading all firms, industries, and societies toward the same end point, or fitness peak. Yet the logic of niche construction reveals, growth leads to variation, not convergence. Applying this logic to economics, Holland and Kauffman conclude that as markets increase in size, they promote growth by increasing variety.

Optimization Constrained by Topology: How Ecology Affects Decision-making

According to the logic of niche construction and evolution more generally, it matters a great deal where an agent (an individual or other component) is situated within the system it "inhabits." This is where it becomes useful to have a framework for visualizing how the "survivability" of a population evolves according to the "topography" of its environment, depicted as valleys, hills, and ranges and peaks.[16] It will also help us to visualize why current institutional choices are not independent of prior choices.

Biologists describe fitness landscapes as exhibiting great variation, ranging from being either smooth or extremely rugged. The rugged peaks represent highest fitness levels, and the

[16] Fitness landscapes are explored by (Richter & Engelbrecht 2014; Gavrilets 2004; Reeves 2005; Svensson & Calsbeek 2012).

valleys represent the lowest. On a smooth landscape, with a flat open view of the horizon, all paths lead to the highest peak (think of Thomas Friedman's proverbial "flat world").[17] No obstacles en route to the global peak exist on a flat landscape; regardless of their selected paths, the adaptive walks of all populations that inhabit the environment will conclude at the same end point.

Predicting an attainable evolutionary outcome for populations on rugged landscapes is far more difficult than predicting outcomes on flat or smooth landscapes. Rugged landscapes have many local peaks, and only some paths lead to the highest fitness. An agent's position within its landscape, the height and range of the local peaks it must climb to peer into the future, the interactions of its landscape with neighboring landscapes, and even the prior behaviors that placed it into its current position—all these will determine the options and strategies that populations can pursue. The local peaks may even conceal the highest peaks, so that once having embarked on a path that leads to a local peak, a population may "get stuck."

Local fitness peaks are smallest and easiest to scale, but they rarely converge to optimal, or global, fitness. Nevertheless, a population will adopt survival strategies based on its position within its landscape, and will most often move uphill only toward its own local fitness levels.[18] Figuratively, a population can't just reverse course and climb down the local peak in the hope of finding a better path, one that leads to a higher fitness peak.

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[17] This can be represented as a M. Fuji peak in which the map only goes up.

[18] In biology a population sends out feelers, mutations that go off in any number of directions; if a mutation succeeds in occupying a higher peak, selection will pull the population in that direction, but very few mutations will find the path that leads to the highest peak.

When applied to the question of institutional selection and regime transition, fitness landscapes provide strong reason to doubt that the optimal choice, the one that leads to the highest fitness function, will be the one chosen. They help us to visualize why not every population has the same number of good designs or policy choices from which it can select to maximize its fitness, and therefore why evolutionary outcomes on different landscapes will not produce convergent outlooks. Leaders will not see the same sets of alternatives due to the different impediments that arise from fitness landscapes of differing degrees of ruggedness. This is why common material aspirations have seldom produced a middle class with common outlook in matters like individual rights or the role of the state.

In sum, fitness landscapes are a spatial dimension metaphor for the obstacles that constrain a population's decision-making. Along with niche construction, a fitness landscape exemplifies the principal that a regime's intrinsic virtues, or "fitness," cannot be separated from the ecology or system within which it operates and interacts with the strategies of other populations in that shared environment. Both concepts offer insights as to why a regime's internal fitness is best understood in the context of the larger system it inhabits, and why the "attraction" of the top performers (highest peak) is highly constrained. Both notions can help direct contemporary social thought away from the assumption that competition among and within nations will guide policy toward the same set of optimized solutions toward the ideal end point.[19]

[19] External competition, in a global environment of market liberalism, will drive all firms and nations to similar regulatory structures, similar standards of living, and eventually similar systems of domestic governance. To attain this peak, the best organizational norms will be

Agent Rationality that Retards Convergence Heighten Variance Between Groups

As the examples of Turkey and China indicate, financial returns can be fast and sudden, while cultural change emerges slowly. Studies of evolutionary social psychology can provide insights as to why the liberal ideas of a just and legitimate social order do not spread as quickly as fast-food chains; and why civil rights are harder to obtain than refrigerators or cars. Evolutionary theory can also provide insights into how agent cognition can slow the mechanisms of collective learning and cause the proliferation of divergent political choices.

Just as research in evolutionary biology now places genetics in the broader context of population history and ecology, the approach of social anthropologists (Richerson & Robert 2005) is to explain social learning by considering the entire population. This perspective clarifies why, compared to learning from personal trial and error, copying the behavior of others reduces social learning costs.

Considerable social costs are incurred when all individuals engage in trying to improve their situation by calculating the course of action that maximizes personal gains and minimizes losses. The copying of local norms and beliefs will outperform individual learning, providing society with the largest amount of cumulative information at the lowest cost to the population. It enables the maximum amount of social improvement to accumulate, by generating an aggregate outcome that is greater than what can be accomplished by dint of costly and time-consuming individual effort.

But there is a paradox. It is adaptive for individuals to copy the behavior of people like themselves, those whose circumstances are similar to theirs, rather than highly successful

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selected; the convergence of productive capacity will produce convergent values, epitomized by a global middle class with the same culture of efficiency and the same social aspirations.

models, regardless of whether the individuals are making the best decision. "This is particularly true for the poor and less well educated, whose ability to bear the costs of direct evaluation of innovations is limited. Interestingly, the poor and less well educated typically imitate people of high *local* social status, not socially distant elites whose life situation is far from potential adopters" (Richerson & Robert 2005, p.125).

Yet when individuals or groups confront conditions not previously experienced in their lifetime, grossly maladaptive behaviors can result from copying the behavior of one's neighbors. During periods of abrupt social change, when the environment changes faster than the *response time* allotted the agent, local information is likely to be insufficient: "No matter how error-prone your best guess is about what to do, you are bound to do better than imitating someone whose behavior is surely out of date" (Richerson & Robert 2005, p.118).[20]

In *Positive Linking* British economist Paul Ormerod (Ormerod 2012) introduces additional considerations to show how copying may reduce the likelihood of a qualitatively better result. In his discussion, agents use heuristics in the face of uncertainty, and these reinforce networks effects, causing a flocking behavior that substitutes for exacting cost-benefit calculations. When people decide to copy to remove the burden of thoughtful assessment and a

[20] Robert Axelrod's pioneering efforts in applying evolutionary theory to social systems lead him to conclude that "similarity leads to interaction, and interaction leads to still more similarity" (Axelrod 1997, p.205). This tendency to interact with those with whom one is similar (homophily) can interfere with the diffusion of optimal designs that characterize the most efficient societies. He also observes that when people learn from those around them, those most like themselves, differences from other groups are retained.

comparison of options, he concludes, they reduce the range of available options and make the selection of objectively inferior alternatives more likely.[21]

Conventional notions of agent cognition cause transition theory to underestimate the pull of China, and overestimate the pull of liberalism.[22] The evolutionary logic underlying adaptive learning by imitation helps us to understand why China, with its long history of self-governance to draw upon, will look to local models to guide future choices and this can be both adaptive and maladaptive. This same logic also illustrates why China's experience may be a strong attractor for other developing nations. China does not have to be the ideal end point to be copied by other emerging nations. It is sufficient for China to be the most familiar starting point for them to look to and find possibilities for themselves. The tendency of individuals to acquire beliefs from those closest to them also ensures that China's success with developmental authoritarianism will transfer to its network of trade partners, enabling it to shape new group norms and alter the behavior of other nations (Root 2013, pp.197–236).

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[21] The paradox of suboptimal selection does not disappear but persists even as societies become more affluent, Ormerod tells us, because as consumers gain an ever-increasing number of services and products from which to choose, they have relatively less time to make informed choices. Faced with uncertainty and time constraints, they will seek shortcuts; it is easier to observe what other consumers have chosen than to conduct a comprehensive search, and this creates a tendency of flocking. A product can emerge as the most popular with only a slight advantage early in the search process. Consumers might make decisions based on vivid and memorable first impressions. Again, however, the choice may not be the best available.

[22] Michael Mandelbaum's *Democracy's Good Name* (Mandelbaum 2007) exemplifies traditional conception of social learning in which countries mimic the most successful economies.

Studies of evolutionary social psychology expose how conventional notions of agent cognition simplify the mechanisms by which collective *learning* transfers to collective *behavior*. While emphasizing that copying is how individuals gain confidence in their decisions, it does not ensure that the maximally efficient or optimal choice will be made. It depends also on the choices made by other actors with whom one may interact. This poses a far greater challenge to social reformers than just the correction of digressions from optimality by supplementing of incomplete information.

Reconciling Cross-Scale Dynamics: Different Speeds of Social Transition cause Irreversible Bifurcations

Unintended and unforeseen consequences arising from social, political, and economic processes that operate at different time scales may be difficult to reconcile or to surmount. In

data processing, for example, the time it takes to receive new data will alter the overall content. When a lag factor is observed in agent-based simulations, the delayed appearance of one variable affects another, causing a qualitative and irreversible change in the outcome. If one agent is delayed and another agent is not, how they interact is affected, their relationship will be altered, they will not be on equal terms, and this will affect the context and outcome of their interaction.

When economic and political development occur at different speeds, the lagging variable can "lock in," with a dramatic effect over long evolutionary time scales, reinforcing evolutionary processes of differentiation, selection, and amplification that can persist for generations. Policies made "in the moment" to surmount immediate challenges of ungovernability, such as the imperatives of ethno-nationalism or patron-clientelism, can affect the costs of governing later. Small changes at nascent stages can have more substantial impacts than larger changes attempted

at later stages; this is because once an institutional adaption occurs, the increase of utility that its benefactors derive creates strong vested interests, deeply ingrained habits, and a tendency to seek salvation in the solutions of the past.

If values and institutions do not converge quickly during the early stages of transition, the differences between the latecomers and the first-movers may be irreversible. Similarly, the local context in which actors interact and influence one another will shape subsequent responses, causing enduring differences between the first-movers and the latecomers. The evolutionary dynamics that arise from niche construction and that can be mapped in fitness landscapes—"path dependencies" or "sensitivity to initial conditions" and "lock-in"— exert powerful self-reinforcing processes that may become irreversible over time.[23]

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[23] The self-reinforcing effects of "lock-in" has many applications in political economy and can help explain why high income need not promote democracy, and why democracy may not be in China's future. As the political economy of contemporary China becomes a mature system, its fitness will increase, but only to a point where it can protect its niches from competitors. So long as economic performance is sustained, it confirms that the party knows best, enabling groups with self-interest in the status quo to become entrenched and thereby slowing adaptation to an incremental pace. As a mature system, few changes are likely to be improvements; most changes will only harm it. The process of normalization might diminish the country's prospects for convergence toward liberal values and at the same time will sustain interests that are vested in networks of nepotism and corruption (Cheung 1982).

The long-term goal of India's first prime minister, Jawaharlal Nehru, was to make India the democratic example for other aspiring nations. Yet this was compromised by his shorter-term goal of ensuring a Congress Party victory over its political rivals. He understood that the existing

Conclusion: Evolving Properties of Global Connectivity

A belief that economic growth will impel nations toward a single optimal form representing the climax of political organization is difficult to reconcile with the novelty that results from the multi-scale dynamics of political, social, and economic processes that operate at different speeds.

(1) *Where a population starts will shape where its journey ends*. Populations facing different landscapes are unlikely to evolve the same way since adaptive climbs on local peaks involve different degrees of difficulty and offer different perspectives of the wider landscape. Differences in how far populations can peer into the future will determine the time horizons of their decisions (their fitness strategies), and can cause perspectives on security and stability to vary. Since no two landscapes are rugged in the same way, and no two landscapes provide the same views of the horizon, populations on different landscapes will not converge. The first movers of the past and the emerging nations of today did not begin their fitness walks from the same starting point. No wonder different perspectives on the future often situate developed and

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patron-client system would offer immediate payoffs to Congress over trying to create a new concept of social affiliation based on citizenship. This led Congress to ally with local "big men," locking in the preexisting social inequities and patron-clientelism of an earlier time. Even today, basic rights and responsibilities of citizenship are unfamiliar to large segments of India's population. Paul Pierson (Pierson 2000; Pierson 2004) attributes the perplexing continuity of suboptimal institutions and the slow pace of reform to the increasing returns to scale that are captured by groups that enjoy first-mover advantages.

newly emerging powers on opposing sides on a number of key issues concerning global governance and security.

(2) *Economic growth does not produce convergence or continuity*: Complex adaptive systems experience episodic upheavals of their own accord; change is discontinuous; and radical discontinuity and sudden transitions can result even from what initially seems like an insignificant reorganization.

(3) *Nevertheless, discontinuous change is not random*: Complex systems often fail to re-stabilize after an initial input is altered. Each successive fork makes the future more unpredictable. Yet even without the linear dynamics of cause and effect, the outcome is not random. The patterns and dynamics of change will be constrained by prior choices, and by both identifiable internal and external stimulus, but they will still not be predictable.

(4) As a consequence, diversions from liberalism may not be temporary: The distinctively

illiberal choices elites make locally have dynamic effects globally; once enough countries have adapted these choices, they will be much harder to reverse. These countries will exert strong pressures for conformity among peers and similarly situated nations.

(5) *Liberalism may be but one of many possible modernities:* Mix, mingle, and become more diverse is a primary lesson of globalization. We should be prepared to feel less at home in a world of multiple modernities that do not follow the top-down emulation and inculcation of norms. Instead, self-reinforcing micro-level change processes—sensitivity to initial conditions, network effects, emergence, scale effects, phase transitions, and niche construction—may combine, hastening vastly different political outcomes among developed and emerging economies, and among old and new nations. Relating the dynamics of complex systems to contemporary political economy analysis will enable the political economy of institutions (1) to

gain a better grasp of the historical evolution of society; (2) to better apprehend the tangled web of culture, trade, and governance we are weaving; and (3) to grasp the waves of self-affirming ideas and cascades of future growth that lie ahead.

Efficiency or Sustainability: Which Should Global Public Policy Optimize?

Framing global development with ideas from the science of complex systems opens a debate over what development policy should optimize. Global development through variation, the core insight of this paper, contrasts with the conventional emphasis on efficiency via convergence to a universal formula for optimality that is characteristic of microeconomics. Economics defines optimization as seeking the most efficient path to a fixed end point. This has made "catching up" a challenge of correcting inferior choices ("digressions from optimality"). In complex systems, no single attribute, strategy, or type can solve all optimization problems; adaptive systems need not result in optimal structures. This insight should discourage local policymakers from seeking to benchmark "best practices." If all populations pursue efficiency and define it by the same criterion, healthy diversity may be compromised—and this might amplify risks to global stability.

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