A cyclical model of institutional change

Chris Papenhausen

Abstract

Purpose – Previous research on institutional change has largely ignored its cyclical nature. This paper aims to introduce a four-phase cyclical model of long-term institutional change.

Design/methodology/approach – The recurrent patterns of the model have been identified from previous technological revolutions and their accompanying surges of development. The model also incorporates generational theory as a driver of institutional change.

Findings – The model predicts that a multi-year institutional crisis is currently underway that has important implications for practitioners. The paper also describes proposed solutions to the current crisis.

Originality/value – The model developed synthesizes disparate institutional theories to build a new explanation for long-term economic development.

Keywords Organizational change, Economic development, Innovation

Paper type Conceptual paper

Introduction

Previous historical research has identified a cyclical pattern in economic development frequently referred to as long waves of development. Perez (2002) has argued that a primary driver of the long wave is institutional change lagging technological change. Independently of long wave theory, historians (Strauss and Howe, 1991) have constructed a theory of generations that affects institutional change of society in general. The purpose of this paper is to synthesize these two streams of research to further elaborate the process of institutional change in driving long waves of economic development.

The process of institutional change has in recent years been the subject of increasing research. This research has identified the change as non-linear, incremental, or radical, but generally not as a long-term cyclical process. This paper argues that there is a pattern of repeating phases over 50-60 years that are associated with technological revolutions or long waves of development (Dator, 1999). Institutions are defined as the humanly devised constraints that structure political, economic and social interaction (North, 1991). Institutional change is defined as “a difference in form, quality, or state over time in an institution” (Hargrave and Van de Ven, 2006, p. 866). The paper also incorporates generational theory into the four-phase model. By synthesizing generational theory, institutional theory, and long wave theory, the model contributes a novel theoretical framework for understanding economic development.

Long waves of development

This paper argues that institutional change occurs in four phases in parallel to what are commonly referred to as long waves of development. The following description is drawn from Papenhausen’s (2008) summary of long wave theory. Long waves describe the process...
of long-term growth of the economy, including the interpretation of crucial changes in the capitalist mode of production (Freeman and Louca, 2001). Kondratieff (1979) is often considered to have established the foundations of research into long waves in capitalist development. Schumpeter and others frequently refer to long waves as “Kondratieff waves.” Kondratieff established a general consensus on the approximate dating of the long waves and led one of the first major quantified inquiries into economic history (Freeman and Louca, 2001).

Kondratieff (1979) and several other scholars find that British industrial growth accelerated rapidly around 1780, primarily in the cotton and iron industries (Freeman and Louca, 2001). Driven by water power, this rapid growth constituted the first long wave or the “the industrial revolution,” which lasted from approximately 1780-1840. Long wave scholars have also identified four other long waves since the industrial revolution (see Table I). The second wave revolved around the steam engine and railways, while the third revolution is known as the age of steel, electricity, and heavy engineering. The fourth wave takes in the age of oil, the automobile and mass production. Finally, the current fifth wave, is described as the age of information and telecommunications (Tylecote (1992) adds biotechnology to the current wave). According to Perez (2002) the common features of long waves include distinct core input(s), motive branches, carrier branches, new transport infrastructures, and managerial organizational changes.

It was Schumpeter, however, who identified technological and organizational change as the essential features of long waves. At the core of Schumpeter’s view of innovation is the concept of creative destruction. Indeed, Schumpeter (1950) argues that the “process of creative destruction is the essential fact of capitalism.” The notion that new products and processes, in part, are based on the death of old products and processes leads to a specific view of time: cyclical yet never precisely repeating (Reinert and Reinert, 2006). To put it another way, while history is irreversible and each period is unique, there are consistent rhythms over time. Thus, the economy progresses due to accumulation of innovation while at the same time exhibiting cyclicality. Schumpeter also claimed that innovation is historical by nature, and can only be understood by its clustering and non-random distribution and its relation to the changes in organizational and institutional structure (Freeman and Louca, 2001). Following the Schumpeterian view, Freeman and Louca (2001) describe the following cause of long waves and recurrent characteristics of the long wave: the emergence and diffusion of a cluster of radical innovations that offer a clear-cut potential for supernormal profits, based on proven technical superiority to previous modes of production.

The definition of a long wave used in the current paper is what Perez (2002) referred to as a technological revolution: “a powerful and highly visible cluster of new and dynamic technologies, products and industries, capable of bringing about an upheaval in the whole fabric of the economy and propelling a long-term upsurge of development” (p. 8). According to Perez, a technological revolution is a strongly interrelated constellation of technical innovations, which includes an all-pervasive low-cost input (e.g. coal, iron, steel, oil, or the microprocessor), new products and processes, and a new infrastructure. Critical to this process is the spread of these far beyond the confines of the industries and sectors where they originally developed.

Perez (2002), following in the Schumpeterian path, asserts that technological revolutions begin after a gestation period of indefinite length, when a highly visible “attractor” appears. This attractor is not only a technological breakthrough, but is also a clearly cost-competitive innovation. Examples include the first Model-T plant for the fourth long wave or the Intel microprocessor for the current fifth long wave. Of course, the revolutionary technological constellation is generally a conjunction of new and old technologies. Even though the microprocessor was new in 1971, it combined with previous technologies like transistors, semiconductors, and computers to form the new powerful cluster. In addition, as Perez (2002) notes: “Each constellation contains several technology systems that develop at different rhythms and in a sequence that often depends on feedback loops.” To illustrate, she uses the current information revolution, which began with chips and hardware followed by software and telecommunications equipment and the Internet, each building on and
<table>
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<th>Condensed summary of the long waves</th>
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<tr>
<td><strong>Constellation of technical and organizational innovations</strong></td>
<td><strong>Examples of highly visible, technically successful, and profitable innovations</strong></td>
</tr>
<tr>
<td>1. Water-powered mechanization of industry</td>
<td>Arkwright’s Cromford mill (1771) Henry Cort’s “puddling” process (1784)</td>
</tr>
<tr>
<td>2. Steam-powered mechanization of industry and transport</td>
<td>Railways and railway equipment Steam engines Machine tools Alkali industry</td>
</tr>
<tr>
<td>3. Electrification of industry, transport, and the home</td>
<td>Carnegie’s Bessemer steel rail plant (1875) Edison’s Pearl St New York Electric Power Station (1882)</td>
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*Source: Freeman and Louca (2001, p. 141)*
favoring the further development of the previous advances. These feedback loops partially account for the uneven development of technological revolutions. Other reasons for this sometimes uneven development are the necessary learning on the part of consumers and producers to take advantage of the new technologies and the establishment of technical standards.

A third cause is the structural crises of adjustment in institutions. The assumption here is that entrepreneurs, innovative managers, and financial providers adapt more quickly to the new paradigm than do institutions. Thus the early stages of the new paradigm are driven by these entrepreneurs, financiers, and managers, while the institutions are slower to respond.

Perez (2002) includes as causal mechanisms behind long waves the “much greater inertia and resistance to change of the socio-institutional framework in comparison with the techno-economic sphere, which is spurred by competitive pressures” (p. 6). As Perez (2002) notes, if “technological revolutions remained as forces of change in the economic sphere and society adapted gradually and easily to the new products and means of transport and communication, the whole process could be described simply as the form taken by ‘progress’ and technology could be treated as an exogenous variable. Such changes, however, are far from smooth” (p. 22). She asserts that it is the institutional forces in society that most delay the diffusion of the paradigm, “but while competitive forces, profit seeking and survival pressures help diffuse the changes in the economy, the wider social and institutional spheres where change is also needed are held back by strong inertia stemming from routine, ideology and vested interests. It is this difference in rhythm of change, between the techno-economic and the socio-institutional spheres that would explain the turbulent period following the big-bang and therefore the lag in taking full social advantage of the new potential” (p. 26).

The process of institutional innovation then is a primary causal mechanism of the long wave. Institutional areas relevant include education and training, intellectual property regimes, company law, and international trade and competition (Nelson, 2002).

Generational theory
This section introduces generational theory as previously described by Papenhausen (2006). As Strauss and Howe (1991) note, at the beginning of recorded history the generation was the standard measure of cosmic time in nearly all Indo-European cultures. The meaning of generations historically is ambiguous and frequently incorporates the concept of family generation: i.e. the set of all children “brought into being” by a father or mother (Strauss and Howe, 1991). The definition of generation used in this paper, in contrast, refers to a more specific concept: the cohort generation, a cohort-group that shares an age location in history and therefore a common peer personality (Strauss and Howe, 1991). The cohort generation “has no direct connection with genealogy or lineage. It is defined, instead, as everyone who is ‘brought into being’ at the same historical moment” (Strauss and Howe, 1991, p. 436). Throughout this paper the term generation is defined as “a cohort-group whose length approximates the span of a phase of life and whose boundaries are fixed by peer personality” (Strauss and Howe, 1991, p. 34). Readers will note that generation is used as a group construct and not an individual construct like age.

Strauss and Howe (1991) offer the first comprehensive theory to explain generations, relying on a cyclical theory of history and generations to develop their theory. The authors make two assumptions: generational cohorts’ social behavior is governed by a well-defined, relatively unchanging lifecycle; and the lifecycle includes four basic life phases, each based on a multiple of the span between birth and coming of age:


3. Rising adults (age 22-43). Central role: activity (working, starting families and livelihoods, serving institutions, testing values).

4. Youth (age 0-21). Central role: dependence (growing, learning, accepting protection and nurture, avoiding harm, acquiring values).

Next, the authors imagine a sudden shock or what they term a “social moment” – for example, a major war or revolution. Here they make a third assumption: Any social moment affects an individual's personality differently according to his or her current phase of life. An example of this might be a war where youths attempt to keep out of the way, while rising adults arm to meet the challenge, mid-lifers organize the troops, and elders establish the purpose of the war. As Strauss and Howe (1991, p. 441) explain:

The stress of responding to the social moment leaves a different emotional imprint and memory with each group according to the role it is called upon to play. These differences, furthermore, are reinforced by the social interaction with each group. . . . With this social moment, four adjacent cohort-groups separately coalesce into generations, each with a distinct peer personality . . . The length of these generations depends on the length of the phases of life, assumed here to be twenty-two years.

Until now Strauss and Howe (1991) have explained how generations form but not their cyclical nature. To do that, they make two additional assumptions. The first alleges that “a social moment not only shapes personality according to current phase-of-life roles, but also forges an enduring bond of identity between each cohort-group and its role – an acquired style that redifnes both how each group will later regard itself and how it will later be regarded by others.” The second notes “a central role acquired during a social moment can extend into the next life phase-but not into the life phase after that” (p. 444).

To carry this a step farther, the generation in the rising adulthood phase during a social moment carries with it a dominant social role into midlife. However, once this dominant generation reaches adulthood, a new generation in rising adulthood triggers a new social moment and wrests dominance away from the earlier generation. To this end, history creates generations and generations create history, thus creating a two-stroke rhythm. Strauss and Howe (1991) claim four generational archetypes repeating sequentially and here they make one final assumption: “during a new social moment, each generation will redefine the central role of the phase of life it is entering in a direction that reverses the perceived excesses of that role since the last social moment” (p. 447).

The result is a recurring generational fixed order:

1. A dominant, inner-fixated idealist generation grows up as increasingly indulged youths after a secular crisis; comes of age inspiring a spiritual awakening; fragments into narcissistic rising adults; cultivates principle as moralistic mid-lifers; and emerges as visionary elders guiding the next secular crisis.

2. A recessive reactive generation grows up as under-protected, criticized youths during a spiritual awakening; matures into risk-taking, alienated rising adults; mellows into pragmatic midlife leaders during a secular crisis; and maintains respect (but less influence) as reclusive elders.

3. A dominant, outer-fixated civic generation grows up as increasingly protected youths after a spiritual awakening; comes of age overcoming a secular crisis; unites into a heroic and achieving cadre of rising adults; sustains that image while building institutions as powerful mid-lifers; and emerges as busy elders attacked by the next spiritual awakening.

4. A recessive adaptive generation grows up as overprotected, suffocated youths during a secular crisis; matures into risk-averse, conformist rising adults; produces indecisive midlife arbitror-leaders during a spiritual awakening; and maintains influence (but less respect) as sensitive elders.

The four generational archetypes differ from each other on three primary dimensions: individualistic vs. collectivist, outer vs inner-fixated, and dominant vs recessive. The lineup of recent generation names, archetypes and birth years are displayed in Table II.
The theory does have limitations. First, the generational peer personality does not apply to each member of a generation. There exists what Strauss and Howe call “suppressed” members of each generation who do not share the primary peer personality of a generation. The authors surmise that their theory describes personality only to the extent that it applies to an entire generational cohort and not to any individual specifically. In addition, cusps appear around the borders of each generation often manifesting characteristics of both generations, making each fuzzy.

A four-phase model of institutional change

One purpose of this paper is to argue that the generational constellation is associated with the institutional changes of the long wave. Although Alexander (2002) argued that generations interacted with long waves, to date, the connections between generations and the institutional features of the long wave have not been explored.

The primary generational characteristic that affects institutions is the individual/collectivist dimension. The generational lineup of those in the coming of age phase and midlife phase determines the collective zeitgeist. During periods when both phases are occupied by collectivist generations, institutions are at their strongest. Conversely, when the phases are occupied by individualistic generations, institutions are at their weakest.

For example, Eisenstadt (2002) asserts there are common universal cultural antinomies in modernity: rational vs non-rational thinking, reflective vs active disposition, totalizing vs pluralizing and control or discipline vs autonomy or freedom. These antinomies are implicit in generational theory. By their nature antinomies are contradictory, which results in oscillation towards one end of the continuum or the other without ever reaching equilibrium. In generational theory, the antinomies, being mediated by generations of length of approximately 21 years, modulate society’s progressive trajectory, albeit in a suboptimal manner. However, the notion of progress in modernity is dependent on this cyclicity, or in other words, the trend of progress cannot be separated from the cyclicity inherent in the irreconcilability of the cultural antinomies. As noted above, each generation can be identified along dimensions that are strikingly similar to these universal antinomies: inner vs outer-directed and individualistic vs collectivist. This corresponds well to the universal cultural antinomies as follows. Idealistic generations tend to be non-rational, reflective, pluralizing and concerned with autonomy or freedom. Civic generations on the other hand, tend to be rational, active, totalizing and concerned with control or discipline (Papenhausen, 2006).

Papenhausen (2006, p. 165) also argues that Boomers are more non-rational in their cognitive style than GIs:

GIs rationalize systems, procedures, structures and roles, while Boomers prefer to rely on intuition, feelings, and other inner beliefs. We might say that Boomers tend to tear down rational systems, bureaucracy, structures and institutions, while GIs build them up.

The following description of the four phases of institutional change are then a synthesis of previous theory of long waves (Perez, 2002), generational theory (Strauss and Howe, 1991), and institutional theory (Hargrave and Van de Ven, 2006).

During the first stage of the long wave, actors engage in institutional design where because the issues of the new paradigm have not yet been framed, organizational action is driven by

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Table II: Generational lineup

<table>
<thead>
<tr>
<th>Generation name</th>
<th>Generation archetype</th>
<th>Birth years</th>
</tr>
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<tbody>
<tr>
<td>Generation X</td>
<td>Reactive</td>
<td>1961-1981</td>
</tr>
<tr>
<td>Baby Boomers</td>
<td>Idealist</td>
<td>1943-1960</td>
</tr>
<tr>
<td>Silent</td>
<td>Adaptive</td>
<td>1925-1942</td>
</tr>
<tr>
<td>GI</td>
<td>Civic</td>
<td>1901-1924</td>
</tr>
<tr>
<td>Lost</td>
<td>Reactive</td>
<td>1883-1900</td>
</tr>
<tr>
<td>Missionary</td>
<td>Idealist</td>
<td>1860-1882</td>
</tr>
</tbody>
</table>
technical considerations (Hargrave and Van de Ven, 2006). Conflict in the institutional sphere is not as intense because, for the most part, entrepreneurs act outside of the dominant institutions, which emerged during the previous paradigm. Generationally, the idealist generation is in mid-life and reactive in coming of age. Both these generations are individualistic; therefore, institutions are at their weakest point. The most recent example is the period 1982-2005 where baby boomers were in the midlife phase and generation Xers were in the coming of age phase. Both these generations are individualistic and focused on individual efforts to create and exploit the emerging new paradigm. This leads to the first two propositions:

\[ P_1 \] Institutional change during the first phase of the long wave is characterized by the institutional design model.

\[ P_2 \] The generational constellation during the first phase of the long wave has Idealists in the midlife role and reactives in the coming of age role.

In the second stage, the long wave is characterized by a collective action model of institutional change (Hargrave and Van de Ven, 2006). This is driven by the need for institutional reform, which is in response, among other triggers, to previous financial excesses of the first phase, as well as the need for collective action to further develop the requisite institutional framework for the full flowering of the new paradigm. Generationally, the reactive generation is in midlife, but the dominant civic generation is coming of age, which drives increasing attention on building new institutions to adapt to and enable the diffusion of the new long wave technology and paradigm. The previous example was the period 1929-1945. The New Deal was instrumental in setting up an institutional framework that subsequently provided for the mass production or Fordist paradigm to expand. It is expected that we are currently in or very near the beginning of this stage today. These arguments lead to the following propositions:

\[ P_3 \] Institutional change during the second phase of the long wave is characterized by the collective action model.

\[ P_4 \] The generational constellation during the second phase of the long wave has reactives in the midlife role and civics in the coming of age role.

The final stages of the long wave are characterized by the adaptation and diffusion models of institutional change (Hargrave and Van de Ven, 2006). Here the new paradigm has won the institutional battle and has become legitimated and ratified. This further reinforces the dominance of the new paradigm and further changes are made that align with the new paradigm. However, near the end of the long wave, the diminishing returns associated with the paradigm leads to more political attempts, including exporting the paradigm to new markets (such as less developed countries). Generationally, the third stage sees the civic generation in mid-life and an adaptive generation coming of age. Since both generations are collectivist in nature, institutions are at their strongest point. During the fourth stage the adaptive generation fills the midlife role and the new dominant idealist generation fills the coming of age role. Due to its individualist nature, the idealists drive a breakdown of institutions, leading to an opening for entrepreneurs to develop a new long wave. The recent example of the third stage is the period 1946-1964. This was the era of strong institutions and the full deployment of the mass production paradigm. The fourth stage was most recently seen in the years 1965-1981. The mass production paradigm was reaching diminishing returns, while the new paradigm was slowly emerging in the form of the microprocessor. Accordingly, this leads to the final three propositions:

\[ P_5 \] Institutional change during the third and fourth phases of the long wave is characterized by the adaptation and diffusion model.

\[ P_6 \] The generational constellation during the third phase of the long wave has civics in the midlife role and adaptives in the coming of age role.

\[ P_7 \] The generational constellation during the fourth phase of the long wave has adaptives in the midlife role and Idealists in the coming of age role.
The current institutional crisis and its managerial implications

This section attempts to answer the question: what is unique to the current institutional crisis underway? The current cycle’s technological revolution encompasses information and communication technologies (ICTs), which have these key unique characteristics:

1. Values:
   - Consensus.
   - Transparency.
   - Connectivity.

2. Features:
   - Customization.
   - Personalization.
   - Interactivity.
   - Globalization.

3. Decentralization:
   - Connected networks.
   - Community based.
   - Greater information content and flow at lower levels of organizations.
   - Open source collaboration.
   - Diversity.
   - Live and work in more sustainable communities.

4. Energy. Potential energy reductions (all other revolutions except ICT had new energy sources as a core input):
   - Smart infrastructure.
   - Information replaces physical transportation.
   - New consumer goods (information, leisure based replace energy intensive).

5. Organization (note: some of these effects are countervailing):
   - Transaction costs decrease, limiting organization size and increasing market size.
   - Resilient and flexible organizations, smaller size organizations.
   - Niche markets.
   - Entrepreneurship.
   - Network effects – larger size organizations.
   - De-layering – cutting out the middle man.
   - Network structure overtaking hierarchical and functional structures.

Of special note above is the unique nature of energy use in the ICT revolution. The prior four technologic revolutions since the industrial revolution all featured innovations in low-cost energy inputs (water, coal, and oil). The current revolution, information and communication technologies (ICTs), however, does not feature a low-cost energy input, but instead a potential energy conserving input: the microprocessor. New institutional arrangements could increase the use of ICTs to minimize energy expenditure. Examples include widespread broadband build-out to enable telecommuting, teleconferencing, and other smart infrastructure projects like real time road information to alleviate traffic congestion, and power grid information systems to smooth out power loads. The development of ICTs therefore could simultaneously increase productivity and use less energy and other natural resources.
Governments, in particular, have an increased relevance at this stage of the diffusion of ICTs. To fully enable ICT diffusion, institutional arrangements or the rules of the game, need greater alignment with the characteristics of ICTs. In addition, infrastructure, a key governmental role, should be aligned with the new technology. Finally, government purchases and activities, due to their large scale can provide sufficient demand to spark new applications of ICTs.

Of course, many of these characteristics have already begun their diffusion throughout the economy. The reordering of institutions, however, is necessary to further diffuse the technology as well as enable new innovations around ICTs. An example would be the automobile in the previous technological revolution. While automobiles had large market penetration rates in the 1940s, the interstate highway system in the US further increased the demand for automobiles. More importantly, however, the highway system led to transportation and infrastructure improvements that enhanced productivity and quality of life. In addition, the businesses related to these improvements increased economic growth. These improvements can feed on each other to make business function more smoothly and with lower risk.

In education, both delivery and the skills that are taught need to be aligned with ICTs as they have been in previous revolutions. For example, Simsek (2005) finds that radical education reforms cluster around the downswings and early upswings of long waves:

1. The second wave was associated with the common school movement and invention of vocational-technical education.
2. The third wave saw the rise of the progressive pedagogy and high school movement.
3. The fourth wave witnessed scientification of school curriculum, behaviorist pedagogy, massification of higher education, Fordist organization and equality of educational opportunity.
4. The fifth long wave is associated with the neo-liberal market approach to education, decentralization, post-Fordism, and constructivist pedagogy.

Other necessary institutional rearrangements include altering property rights to reflect the innovations in intellectual property that are part of the ICT revolution. Legal institutions, especially those regarding financial institutions, need to reflect innovations in securitization and financing that have systemic risks. In addition, tax policy should reflect the wealth generating effects of an information centered economy.

**Conclusion**

This paper argues that institutional change consists of four phases over a period of approximately 60 years. This cycle results from lags in institutional change arising from technological revolutions and generational influences of society at large. The implications of this argument include the possibility of prediction. The propositions offered lead to the conclusion that a new period of institutional crisis requiring collective action led by a new coming of age generation of civics has either begun or is close at hand. Thus, practitioners as well as scholars should benefit from the arguments presented here that generational effects have interacted with technological revolutions to drive institutional change.

The current second stage of ICT diffusion – institutional reordering – requires changing the rules of the game in order to drive further economic growth. The process of creative destruction as described by Schumpeter drives the replacement of the previous technological revolution with the newer one. The development of the ICT economy, which emerged largely from fragmented innovation during the 1980s and 1990s, needs to turn to a collective action model in order to reach its potential.

**References**


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