

Learning and Institutional Change: Based on the Theory of Institutional Change

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Abstract. This paper focuses on the interaction between learning and institutional change. Theory of institutional change provides the theoretical basis for the paper. Individual and organizational learning is a good perspective for delving into institutional change. The driving force of institutional change is either the change of external environments or occurrence of internal learning. The investments of knowledge and skills shape the perception for external environment. The cognitive structure and the mental models will alter because of the new perception for the world. When the same mental model is confirmed by the environment feedback many times, the mental model is stabilized and becomes belief. Belief systems are the internal representation and institutions are the external manifestation of that representation. This implies that the occurrence of learning leads to institutions evolving. The kinds of knowledge and skills acquired by learning shape the direction of institutional change, and the quantity and quality of learning determines the speed of institutional change.

Introduction

Institutions are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction [1]. In consequence, institutions shape the relationship in human activities. Institutions are indispensable artifactual structure in all fields. Therefore, institutional change shapes the path of society evolving. The effectiveness of institutions determines the development of society. It is vital for understanding the process of social development to learn the institutional change. Understanding the incentives of the institutional change is becoming an increasingly central question in various fields. What makes institutions evolve? How do institutions change? Why there is the demise and emergence of institutions? It is essential for questing the answers to these questions.

The issue of institutional change has become to prominence since last decades. Ha-Joon Chang draws together contributions from scholars in economics, history, political science, sociology, public administration and business administration and concludes that there is no simple formula for institutional development. Instead, real-life experiences of institutional development have been achieved through a mixture of deliberate imitation of foreign institutions and local institutional innovations [2]. Caner Bakir and K. Aydin Gunduz show that the current state of knowledge about institutional change in key macroeconomic bureaucracies is characterized by a lack of sufficient bridge-building among variants of institutional approaches as well as between institutional theory and public policy theory, resulting in persistent knowledge gaps[3]. Stephanie Decker et al. address how historical research can contribute to our understanding of institutional change while demonstrating “dual integrity” in terms of being significant pieces of historical research[4]. Magnus G. Schoeller and Adrienne Héritier find while urgency plays a crucial role in times of crisis, distributional consequences come to bear in policies where core state powers are at stake [5]. Even though there is great progress in study of institutional change, many important knowledge gaps still

exist. These gaps should be filled so that the society can make progress. The paper tries to fill some gaps from the perspective of learning at theoretically level.

Institutional change is not just about institutions, it's actually about the brain and the mind. Because institutions are artificial structure that the mind constructs in our brains. Douglass C. North, one of founder of the New Institutionalism, has done plenty of studies on institutional change. In this paper, I attempt to account for the incentive of institutional change, beginning with the North's theory of institutional change. Next, some topics about learning will be explored. Then, the study probes the interaction between learning and institutional change with the latest research findings in brain science, cognitive sciences, neuroscience, and so on. Finally, some conclusions are showed.

North's Research on Institutional Change

Douglass Cecil North(1920-2015), American economist, has won the 1993 Nobel Memorial Prize in Economics, along with Robert William Fogel, "for having renewed research in economic history by applying economic theory and quantitative methods in order to explain economic and institutional change". His whole academic career focuses on the effect of institutions on the economic development. When he studies how the institutions affect the economic performance, he finds it is hard to explain the long-term stagnation and regression of economy. Then, his study turns to the institutional change.

Since the late 1950s and sixties, North has started his research on the institutional with the application of economic theory and quantitative methods to economic history. North finds that the technical innovation alone is insufficient to promote economic development. In his first major work, *The Economic Growth of the United States from 1790 to 1860*(1966), he realizes it is impossible to explain long-term poor economic performance in a neo-classical framework. In 1968, in his work, *Sources of Productivity Change in Ocean Shipping, 1600-1850*, he argues because the institutional change reduced that cost, so that the efficiency in ocean shipping increased[6]. Consequently, North's research turns towards transaction costs and institutions as two important elements.

From 1970s to late nineties, North has constructed the institutional change theory including the elements of property right, state and ideology. Throughout the 1970s, north's papers and books show that the institutions, especially the property rights, are important in explaining the economic performance. In his work, *The Rise of the Western World: A New Economic History*(1973), he argues that the neo-classical economic theory can't account for the fundamental societal change and begins rethinking his research tools. North concludes that England and the Netherlands industrialized faster than other European countries, because of the two countries constructing the guild system, which imposed restrictions on entry and work practices in various occupations, was weaker in those two countries than in other European countries[7]. In his work, *Structure and Change in Economic History* (1981), his research is out of the assumption that institutions are efficient. He argues that the societies always are locked into dysfunctional institutions. The main lesson that North learns is that the economic growth needs the efficient system of property rights. In his work, *Institutions, Institutional Change and Economic Performance* (1990), North put forward that the subjective and incomplete processing of information accounts for ideology, based upon subjective perceptions of reality, playing a major part in human beings' choices. At this stage, North constructs the institutional change theory with three main elements, including property rights, ideology and state in the framework of Neoclassicism.

From the late 1990s, North absorbs a lot of knowledge of evolutionary biology, cognitive science, neuroscience, social science and so on, especially the research of brain science, which makes his research on institutional change out of the neoclassical paradigm. He draws on cognitive science to explain how people make the choices. In his book, *Understanding the Process of Economic Change* (2005), North tries to construct a revolutionary framework to explain the economic change. He integrates the cognitive science and neuroscience, from the view of evolutionism, discussing the institutional change. He explains the institutional change by exploring how the mind working, how the mental model constructing and how the belief forming. At this stage, North explores the effect of

learning, development of knowledge and skills, on the institutional change. Actually, Learning, stock of knowledge evolving, plays a role in institutions evolving.

Learning

We live in the space-time of constant change. We must be able to constantly change and develop ourselves in order to keep pace with the changes in our environment and life situation. Therefore, this has created a rapidly growing need for learning[8]. The frontier researches on learning intergrate psychology, brain science, neuroscience, cognitive science brain science, from the internal and external perspectives. What is learning? Knud Illeris concludes that the concept of learning is based on two fundamental assumptions. Firstly, that all learning includes two essentially different types of process, namely an external interaction process between the learner and his or her social, cultural and material environment, and an internal psychological process of acquisition and elaboration in which new impulses are connected with the results of prior learning. Secondly, that all learning includes three dimensions, namely, the cognitive dimension of knowledge and skills, the emotional dimension of feelings and motivation, and the social dimension of communication and cooperation—all of which are embedded in a societally situated context. He defines learning as all processes that lead to relatively lasting changes of capacity, whether they be of a motor, cognitive, psychodynamic (i.e. emotional, motivational or attitudinal) or social character, and which are not due to genetic-biological maturation[9]. North shows that learning is the accumulation of experiences, investment of knowledge and skills, increments of stock of knowledge, and so on.

How learning occurs? North put forward that learning occurs at two conceptually distinct levels. First, learning entails developing a structure by which to make sense out of the varied signals received by the senses. The initial architecture of the structure is genetic but its subsequent development is a result of the experiences of the individual. Second, learning preserves the categories and concepts intact but provides changed ideas about details and the applicability of the existing knowledge[10]. In order to understand the physical environment and socio-cultural linguistic environment, individuals try to learn. When individuals learn, the mental models will evolve to reflect the new experiences. The world is too complex for a single individual to learn how it works. The cultural heritage provides a means of reducing the divergence in the mental models that people in a society have and also constitutes a means for the intergenerational transfer of unifying perceptions. Therefore, cultural learning occurs. Cultural learning in pre-modern societies not only provides a means of internal communication but also provides shared explanations for phenomena outside of the immediate experience of the members of the society in the form of religions, myths and dogmas[11].

North argues that there is individual learning and collective learning. Individual learning is the complex modification of the mental models according to the feedback received from the environment[12]. Collective learning consists of those experiences that have passed the slow test of time and is embodied in our language, institutions, technology, and ways of doing things [13]. It is “the transmission in time of our accumulated stock of knowledge”[14]. The two levels always occur at the same time. Individual learning means the incremental stock of knowledge in whole society and the cumulative process of culture. In turn, the contents and ways of individual learning are limited by the collective culture. In North’s opinion, learning is the new experiences in a given culture environment, reflecting as cognitive structures and mental models changing. When the same mental model is confirmed by the environment feedback many times, the mental model stabilizes to become belief. Essentially, learning leads to individual beliefs and the social belief systems evolve.

Learning and Institutional Change

Institutions are important, which are the key to the interaction between individuals, and the foundation of the organization’s survival. Facing the continually changing environments, institutions have to evolve to meet the need of rapidly changing environments. What makes the institutions evolve. North argues that the sources of institutional change are the opportunities perceived by the

individuals and organizations. The opportunities stem from either external change in the environment or the acquisition of knowledge and skills by learning which are incorporation in the mental constructs of actors[15]. The external sources of institutional change are important, but the taste of decision-maker for knowledge and skills also matter. The change of external environment requires the change of institutions to meet its needs. However, only individuals and organizations have perceived the change in the external environment, they try to alter the artifactual structure, namely institutions, to meet their ends. Because, firstly, individuals and organizations can perceive the external environments better with new knowledge and skills acquired through learning; secondly, new knowledge and skills acquired through learning are incorporated into the mental models of individuals and organizations. Individuals and organizations apply the new knowledge and skills in the process of decision-making process which make institutions evolve.

How does learning relate to institutional change? It is hard to intergrate traditional studies of learning in psychology and studies of institutional change in institutionalism. Since the 1990s, neuroscientists and brain scientists have come together to enrich the fields of learning. It is only quite recent that their researches connect the learning to the institutional change. To understand their relationship, individuals and organizations, knowledge and skills should be discussed. Individuals and organizations are the agents of learning, knowledge and skills are the contents of learning. Individuals and organizations have perceived the changing of external environments. They expect to acquire knowledge and skills by learning to make institutions more effectively, so that they can acquire more opportunities and resources from the changed institution framework.

How do learning modify the institutional framework? Human lives in an ever-changing world which is full of uncertainty and continually and evolves in novel and new ways. Humans have a ubiquitous drive to make their environment more predictable. To reduce the uncertainty, the drive can encompass anything to be statistically probable. The effort that humans make the environment more predictable is the deep source of institutions. However, the more effort humans make, the more complex and uncertain the environment is. Therefore, institutions should continue to modify to structure the environment and make it more predictable. Humans form the mental model to understand and interpret the external environment. When the learning occurs, the brain will reconstruct the mental models reflecting the feedback from the new experiences. Thus, the mental models may be continually redefined by the new knowledge and skills acquired through learning. The feedback from new experiences sometimes strengthens the initial mental models or makes the mental models modified. When the mental models are strengthened, cognitive path dependence occurs, the same mental model is stabilized to become belief. Therefore, institutional path dependence occurs, too. When the new experiences are incorporation into the initial mental models, and alter the initial mental models, the cognition and perception on the external environment and the things will change. The altered mental models always present to explain the environment. Then, the stabilized mental models become the beliefs and the belief systems evolve. It means the new belief systems guide institutional choices. Belief systems embody the internal representation of the human landscape. Institutions are the structure that humans impose on that landscape in order to produce the desired outcome. Belief systems therefore are the internal representation and institutions the external manifestation of that representation[16].

Consequently, the occurrence of learning leads to institutional change, also leads to institutional path dependence. Firstly, the occurrence of learning which drives the evolution of belief leads to institutional change. Learning, increasement in stock of knowledge, drives the evolution of mental models. When the same mental model presents and stabilizes constantly, it becomes the belief. When beliefs evolve, institutions change. Secondly, only individuals and organizations with institutional decision-making power can guide institutional change after learning. Not everyone's learning is effective for institutional change. Thirdly, some kinds of knowledge and skills the individuals and organizations learned don't always change the institutional path. In the process of institutional change exists path dependence because of path dependence in belief. Some belief systems existing path dependence are difficult to change through learning. The brain filters what kinds of knowledge received and what kinds of information rejected automatically. Even though our brains have learned

and received some kinds of knowledge and skills, these knowledge and skills may be not applied when making institutional choices. Because some kinds of new knowledge and skills may not be consistent with our cultural heritage or ideologies. Even if individuals and organizations want to apply these new knowledge and skills to change the institutional framework, these changed institutional frameworks are difficult to enforce effectively. The path dependence in the belief system becomes an obstacle to the enforcement of the new institutions.

Summary

The progress has been made in brain science and neuroscience provides us a better understanding of the nature of institutional change. Studies on the brain and mind draw learning into the field of institutional change as the drives of institutional change. Individuals and organizations who possess different knowledge and skills will make different choices in institutions, even if the initial institutions given to them is the same. Incremental knowledge and skills make individuals and organizations have capacities and awareness to alter the institutions after they have perceived the changed environment. Individuals and organizations can acquire more accurate perception on the external changing environment because of the occurrence of learning. The kinds of knowledge and skills shape the direction of institutional change. The quality and quantity of learning determines the speed of institutional change.

Because of the nature of human learning, stemming from evolution over millions of years, humans always attempt to perceive the world and structure the external environment. The way the mind processes information depends on the brain's ability to learn. The mind is a complex structure that interprets and classifies the various signals received by the senses. The mind classifies the experiences from the environment, including the physical environment and the sociocultural-linguistic environment. Our brain offers varied cognitive models to describe the mental operations. When our cognition evolves to structure our perception and traces our memories, the mental models gradually change. Our cognitive systems make decision in the light of available knowledge. The way knowledge develops shapes our perceptions of the world around us and in turn those perceptions shape the search for knowledge.

In the process of institutional change, learning occurs under a given cultural heritage, which makes the path dependence exists in the process of institutional change. In other words, the individual mental models are formed on the basis of the shared mental models. In cases when the content of the shared learning is the same or similar over a number of periods, the mental models become relatively inflexible and shared belief systems are shaped. These are in turn the source of cognitive path dependence, since the more inflexible the mental models are, the more difficult their modification and revision becomes. When the cognitive path dependence deepens into the belief system, the artificial structures, namely institutions, also takes place in a path-dependent way. Once all of members in a society or an organization have formed the same mental models, they will learn in the same models, make decision in some particular way. Then, the new path dependence of institutional change will take place. Learning leads to institutional change and institutional path dependence.

There needs a much further explore in the field for understanding the operation of neural networks in mental processes better. To explain the relationship between mind, brain, mental models, neural network and learning, it needs to integrate a mass of knowledge in various fields, such as brain science, neuroscience, cognitive science, biology, computer science, social science and so on. Learning can be thought of as a complex process of modifying mental models based on feedback from the environment. Maybe, the mental models modified by learning don't lead the institutions to success. However, learning can lead to institutional trial, even failure, lead to new trial of institutions. Our brains have very flexible cognitive structures which help we solve the problems. Therefore, our brains are constantly learning to cope with changes in external environments. The cognitive structures and mental models inner our brain change constantly, too. When these cognitive structures and mental models become stylized, the belief system will be altered. It means that the occurrence of learning leads to institutions evolving.

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