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DEPARTAMENTO DE ECONOMIA
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# THREE ESSAYS ON THE HISTORY OF POLITICAL ECONOMY IN THE TWENTIETH CENTURY

# TRÊS ENSAIOS SOBRE A HISTÓRIA DA ECONOMIA POLÍTICA NO SÉCULO VINTE

KEANU TELLES DA COSTA

Brasília
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Orientador: Prof. Dr. Bernardo Pinheiro Machado Mueller

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CONTENTS

# GENERAL INTRODUCTION

The present Ph.D. dissertation is composed of three independent essays on the history of political economy in the twentieth century. I use the concept of political economy here to refer to the broad scientific inquiry of economic science in the spirit of the discipline practitioners until the formalistic revolution in the 1940s and 1950s. In the period after World War II, a profound intellectual transformation of economic science began to privilege the form of an economic argument over its content (see Blaug, 2003). Thus, the concept of political economy that I use incorporates other scientific domains and philosophical inquiries that did not fit the purely formal and abstract economic theory that dominated the profession in the second half of the twentieth century.

However, although the essays are independent of each other and intended to be read as separate units, we can argue that they have one common subtle underlying historiographical theme. The common thread underlying this Ph.D. dissertation is the historical investigation of the reaction of different (and sometimes contrasting) prominent economists in the twentieth century (namely, Friedrich A. von Hayek, Nicholas Kaldor, and Douglass C. North) to the standard neoclassical economic theory, in particular, the notion of perfect knowledge (or what North called the instrumental objective rationality postulate) in the theoretical construct of neoclassical equilibrium analysis.

Therefore, in the first essay, "From Austrian Theory of Capital to Dissent: Nicholas Kaldor, Friedrich A. Hayek, and the Way to Disequilibrium," I reconstruct the intertwined paths of the Hungarian economist Nicholas Kaldor (1908–1986) and the Austrian economist and social philosopher Friedrich A. von Hayek (1899-1992) to what I called disequilibrium economics through the theoretical deficiencies exposed by the Austrian theory of capital and its consequences on equilibrium analysis. A version of this essay was published in *EconomiA* (see Telles, 2023). I use the term disequilibrium economics here in a negative and contrasting sense, meaning a rejection of the fundamental hypothesis of perfect knowledge (or perfect foresight) embodied in the standard neoclassical equilibrium-oriented analysis in favor of a process-based understanding of social interaction by fallible human beings under different institutional arrangements.

I attempt to construct a coherent historical narrative that integrates many intertwined elements and personas that were not connected until now by previous commentators in the secondary literature. These include the reception of the Swedish economist Knut Wicksell in the English-speaking world; Piero Sraffa's critique of Hayek's business cycle theory; Gunnar Myrdal's critique of Wicksell, Hayek, and Keynes; the Hayek-Knight-Kaldor debate; the Kaldor-Hayek debate, etc. In the early 1930s, Kaldor could be classified as an Austrian economist. The critical reaction to the Austrian business cycle theory presented by Hayek in the 1930s revealed the limitations of its embodied theory of capital.

More importantly, the Austrian integration of capital theory into a business cycle theory called attention to the limitation of the theoretical apparatus of equilibrium analysis in dynamic contexts. These limitations exposed in the epitome of the equilibrium theoretical edifice, the neoclassical Wicksellian synthesis of the Austrian theory of capital, contributed to Hayek and Kaldor abandoning the neoclassical equilibrium theory *en route* toward dissent. The critiques made by the Italian Cambridge economist Piero Sraffa (1932a, 1932b) and the Swedish economist Gunnar Myrdal ([1939] 1965) to Hayek's business cycle theory emphasized the indeterminateness of equilibrium in a dynamic, monetary, and expectational economy.

In particular, Myrdal's 1933 critique of Wicksell's ([1898] 1936, [1906] 1935) three conditions to monetary equilibrium led to a reaction against the notion of perfect foresight (i.e., perfect knowledge) intrinsic in the traditional (intertemporal) equilibrium analysis, proper to the capital accumulation and trade cycle phenomena. This is visible in Hayek's (1935) reaction to Myrdal in his Copenhagen lecture in December 1933, leading to the reformulation of equilibrium analysis in terms of social coordination of subjective, tacit, and dispersed individual knowledge in his December 1936 presidential address to the London Economic Club, "Economics and Knowledge" (1937).

Moreover, Myrdal's critique was a central element to Kaldor's emancipation in 1934 and his subsequent conversion to John Maynard Keynes' *The General Theory of Employment, Interest, and Money* (1936). These controversies also had implications for Kaldor's mature intellectual developments, such as the construction of the post-Keynesian models of growth and distribution in the 1950s and 1960s (in particular, his Keynesian income distribution theory delineated in the final pages of "Alternative Theories of Distribution" (1956) used as the solution to the Harrodian

instability problem), the Cambridge capital controversy in the 1960s, and his critique of what he called the neoclassical equilibrium economics in the 1970s and early 1980s.

In the second essay, "Pursuing a Grand Theory: Douglass C. North and the Early Making of a New Institutional Social Science (1950-1981)," I provide a detailed historical account of Douglass C. North's (1920-2015) early intellectual contributions and analytical developments in pursuing a Grand Theory for why some countries are rich and others poor. The systematic, continuous, and profound attempt to answer the Smithian social coordination problem shaped his journey from being a young self-defined serious Marxist in his Berkeley undergraduate days in the 1940s to becoming one of the founders of New Institutional Economics in the early 1980s. In the process, North was converted in the early 1950s into a rigid neoclassical economist, being one of the intellectual leaders in promoting the New Economic History revolution in the mid-1950s and early 1960s. However, in the late 1960s and early 1970s, North surprisingly became a deep critical voice of the cliometric movement, particularly the neoclassical theoretical apparatus embodied in its approach.

The pronounced tension between North's pioneer early work on promoting cliometric research and his subsequent development of New Institutional Economics in the late 1970s and onwards is mainly unexplored in previous discussions. North's Grand Theory quest can be interpreted as the primary gravitational force encompassing the increasing tensions within his adopted neoclassical theoretical framework. The tension between the received economic tradition and its failure to account for institutional structures and economic change urged for progressive theoretical innovations. In North's (1978) perspective, the critical failure of cliometrics as an approach to economic history is that neoclassical economics does not explain evolving economic structures and performance through time, the central task of economic history.

In his 1973 presidential address to the Economic History Association, "Beyond the New Economic History" (1974), North urged his peers to go beyond the received theoretical tradition that was the backbone of the New Economic History. While maintaining the utility-maximizing hypothesis, it was necessary to broaden the frame of reference of neoclassical economics to include a theory of property rights derived from transaction costs, a theory of demographic change, a theory of the state, a theory of ideology, and other sources of non-market decision making. In addition to standard neoclassical production costs, North (1981) incorporated transaction costs, property rights, and contracts to explain divergences of economic performance

across multiple social environments. In the later 1970s and early 1980s, this resulted in the co-creation of New Institutional Economics. A version of this essay is forthcoming in *EconomiA* (see Telles, 2024).

In the third essay, "Manufacturing a New Institutional Social Science: Douglass C. North on Transaction Costs, Institutions, and Economic Change (1981-2005)," I investigate from a historical perspective the attempt of North to construct a New Institutional Social Science, focusing on the period between 1981 and 2005. The manufacturing of a New Institutional Social Science is primarily constituted of an integrative effort involving the multidisciplinary knowledge from all the social sciences merged with cognitive science, i.e., how the human brain works and societies learn, to explain the fundamental Smithian social coordination problem. In the early 1980s, North perceived that the new intellectual path ahead was *terra incognita*, necessarily involving an active theoretical building instead of passively using the existing standard neoclassical theoretical apparatus. Moreover, this new theoretical path should start with the dismantling of standard neoclassical economic theory assumptions.

In the 1980s, North incorporated the multidimensional transaction costs of measuring, specifying, and enforcing the contractual arrangements and property rights that support the exchange processes to ground in an analytical framework the human progression of a world of simple, personal, and tribal exchange to a society marked by complex and impersonal exchange, extended social cooperation, and division of knowledge and labor. With transaction costs, the institutional framework in which property rights and contracts are measured, defined, and enforced assumes a prominent role in explaining the human capacity to capture the gains derived from the division of knowledge and social cooperation through impersonal exchanges.

In addition, the transaction costs analysis opened a whole new territory regarding the supply and choice of institutions, in particular, a theory of the state that defines the property rights structure and enforces impersonal contractual arrangements and the role of ideology that frames the collective choice of the institutional architecture in a free-riding context. In the late 1980s and early 1990s, North extended the transaction cost approach to the political realm of exchange towards a theory of institutional change. North argued that, in general, there is no way of ensuring credible commitment to effect political trade agreements. Therefore, the highly uncompetitive and inefficient political markets generate extractive political institutions that produce inefficient property rights structures and rent-seeking economic institutions.

In the 1990s, North (1990, 1994) began to puzzle seriously about the instrumental rationality postulate of neoclassical economic theory, investigating the cognitive foundations of how human beings construct their subjective mental models derived from personal experiences and cultural learning. Moreover, in his extremely influential book *Institutions, Institutional Change and Economic Performance* (1990), North developed a theory of institutional change that rests on the interaction between institutions and organizations and the cognitive learning process that entrepreneurs and organizations acquire throughout time and across space.

In the late 1990s and early 2000s, North continued to investigate the interplay between cognition and institutions, making a theoretical sketch of an internal cognitive-external institutional approach to analyze how the human mind and societies learn and evolve throughout time. This fundamental evolutionary cognitive-institutional approach to economic change is epitomized in North's 2005 book *Understanding the Process of Economic Change* (2005), where he developed the pivotal concept of adaptive efficiency, an ongoing condition in which society continues to modify or create new institutions as problems evolve.

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# From Austrian Theory of Capital to Dissent: Nicholas Kaldor, Friedrich A. Hayek, and the Way to Disequilibrium

ABSTRACT. In the early 1930s, Nicholas Kaldor could be classified as an Austrian economist. In the theory of capital wars at that time, for instance, Kaldor defended the Austrian theory of capital against the offensive of Frank H. Knight. We reconstruct the intertwined paths of Kaldor and Friedrich A. Hayek to disequilibrium economics through the theoretical deficiencies exposed by the Austrian theory of capital and its consequences on equilibrium analysis. In particular, the integration of capital theory into a business cycle theory by the Austrians and its shortcomings - e.g., criticized by Piero Sraffa and Gunnar Myrdal - called attention to the limitation of the theoretical apparatus of equilibrium analysis in dynamic contexts. This was a central element to Kaldor's emancipation in 1934 and his subsequent conversion to John Maynard Keynes' General Theory (1936). In addition, it was pivotal to Hayek's reformulation of equilibrium as a social coordination problem in "Economics and Knowledge" (1937). It also had implications for Kaldor's mature developments, such as the construction of the post-Keynesian models of growth and distribution, the Cambridge capital controversy, and his critique of neoclassical equilibrium economics.

Key-words. Nicholas Kaldor, Friedrich A. Hayek, Knut Wicksell, Gunnar Myrdal, expectations, equilibrium, capital theory.

RESUMO. No começo dos anos 1930, Nicholas Kaldor poderia ser classificado como um economista austríaco. Nas disputas em torno da teoria do capital na época, por exemplo, Kaldor defendeu a teoria austríaca contra a ofensiva de Frank H. Knight. Nós reconstruímos os caminhos entrelaçados de Kaldor e Friedrich A. Hayek para a economia do desequilíbrio a partir das deficiências teóricas expostas pela teoria austríaca do capital e suas consequências para a análise de equilíbrio. Em particular, a integração da teoria do capital em uma teoria dos ciclos econômicos pelos austríacos e suas fragilidades decorrentes - e.g., criticadas por Piero Sraffa e Gunnar Myrdal - chamaram atenção para a limitação do aparato teórico da análise de equilíbrio em contextos dinâmicos. Tal foi um elemento central para a emancipação de Kaldor em 1934 e a sua subsequente conversão a *The General Theory* (1936) de John Maynard Keynes. Ademais, tal foi primordial para a reformulação de Hayek da análise de equilíbrio como um problema de coordenação social em "Economics and Knowledge" (1937). Isso também teve implicações para os desenvolvimentos maduros de Kaldor, como a construção dos modelos pós-Keynesianos de crescimento e distribuição, a controvérsia do capital de Cambridge e a sua crítica da economia neoclássica do equilíbrio.

Palavras-chave. Nicholas Kaldor, Friedrich A. Hayek, Knut Wicksell, Gunnar Myrdal, expectativas, equilíbrio, teoria do capital.

JEL. B13, B22, B25, B31.

## I. INTRODUCTION

It is not easy to imagine two more distinct and antagonist economists in the twentieth century than the Hungarian Nicholas Kaldor (1908-1986) and the Austrian Friedrich A. von Hayek (1899-1992). Indeed, Kaldor is widely known as a joint architect and a leading figure - with Richard Kahn, Joan Robinson, Luigi Pasinetti, and others - of the Cambridge school of post-Keynesian economics. In the 1950s and 1960s, this group extended the principles of John Maynard Keynes' *The General Theory of Employment, Interest, and Money* (1936) to the long-run analysis of economic growth and income distribution.

Nevertheless, Kaldor started his intellectual career as very sympathetic to the Austrian school as exposed by Lionel Robbins, Hayek, and others. In the 1930s, both Hayek and Kaldor were followers of the so-called Austrian theory of capital, derived from the works of John Stuart Mill, William S. Jevons, Carl Menger, Eugen von Böhm-Bawerk, and Knut Wicksell. It states that the quantity of capital corresponds to the length of time in which primary original factors of production (labor in Böhm-Bawerk's model and labor and land in Wicksell's case) are utilized to produce secondary durable and non-durable (i.e., working) capital goods.

This time length is measured by the average production period (the degree of roundaboutness or capital intensity) which is an increasing monotonic function of the total quantity of capital. The quantity of capital is understood as the length of production stages, the length of time contained in the whole production process, a notion introduced by Menger's *Grundsätze der Volkswirtschaftslehre* (1871). This allowed the extension of marginal productivity theory to the realms of capital. In equilibrium, the marginal productivity of waiting (i.e., the marginal productivity of the average period of production) will be equal to the interest rate.

In this essay, we reconstruct the similar and intertwined paths of Kaldor and Hayek to disequilibrium economics through the theoretical deficiencies exposed by the Austrian theory of capital and its consequences on equilibrium analysis.[1] The critical reaction to the Austrian business cycle theory presented by Hayek in the 1930s revealed the limitations of its theory of capital. More importantly, however, the Austrian integration of capital theory into a business cycle theory and its shortcomings called attention to the limitation of the theoretical apparatus of

[1] The close encounter between Hayek and Kaldor in the early 1930s is relatively unexplored in the secondary literature. The exceptions are Desai (1991) and the very scholarly essay by Klausinger (2011).

equilibrium analysis in dynamic contexts. These limitations exposed in the epitome of the equilibrium theoretical edifice, the neoclassical synthesis of the Austrian theory of capital, contributed to Hayek and Kaldor abandoning the neoclassical equilibrium theory *en route* toward dissent.

The critiques made by Piero Sraffa and Gunnar Myrdal (in a sense both later incorporated by Keynes in 1936) to Hayek's business cycle theory emphasized the indeterminateness of equilibrium in a dynamic, monetary, and expectational economy. In particular, Myrdal's 1933 critique of Wicksell's three conditions to monetary equilibrium led to a reaction against the notion of perfect foresight (i.e., perfect knowledge) intrinsic in the traditional (dynamic or intertemporal) equilibrium analysis, proper to the capital accumulation and trade cycle phenomena. This is visible in Hayek's reaction in his Copenhagen lecture in December 1933 and Kaldor's theoretical emancipation in 1934. The conjunction of the intellectual wars on capital and business cycle theories merged with the economic calculation debate under socialism revealed to Hayek the way to the reformulation of equilibrium analysis in terms of social knowledge coordination in his December 1936 presidential address to the London Economic Club, "Economics and Knowledge" (1937).

In 1937, nevertheless, Kaldor entered into the controversy between Hayek and Frank H. Knight on the theory of capital in a middle-ground position, criticizing the use of production periods and roundaboutness in a trade cycle theory but defending in its own right the Austrian theory of capital. Kaldor (1937b) writes to Knight saying that "I think Hayek's trade cycle theory is entirely wrong (at any rate in the *Prices and Production* form); and this is independent of the rights and wrongs of the Austrian theory. That is to say, I don't think Hayek 'follows' from the Austrian theory of capital at all; and would be equally wrong even if Böhm-Bawerk and Wicksell were spotless."

Kaldor's position in this debate is interesting because the main point that Hayek stressed in his controversy with Keynes (which was also influenced by Wicksell) in 1931 was the logical consequences of a capital theoretical microfoundation to business cycle research. Soon after Kaldor's exchange with Knight, he abandoned the Austrian theory of capital in his conversion process to Keynes. However, many implications of the controversies mentioned above will be noted in his mature writings on the construction of the post-Keynesian growth and distribution models in the 1950s and 1960s (such as his Keynesian income distribution theory used as the

solution to the Harrodian instability problem), the Cambridge capital controversy, and his critiques to what he called neoclassical equilibrium economics in the 1970s and 1980s.

This story might appear surprising to many people since Kaldor is mainly identified with the Cambridge school. Moreover, a long-time Fabian socialist he was an influential voice within the Labour Party in England, performing an important role as Special Adviser to the Chancellor of the Exchequer when the Party came to power in 1964 (until 1968) and later in 1974-6.[2] Not to mention his major contributions in making the two William Beveridge Reports, first the White Paper report on Social Insurance in 1942 and later the extremely influential *Full Employment in a Free Society* (1944). In Beveridge's 1944 book, Kaldor authored the famous appendix C where quantitative revenue and expenditure estimations of an active fiscal policy aimed at full employment were provided. In Hayek's view (1983, pp. 111, 183),

> "Kaldor, through the Beveridge Report, has done more to spread Keynesian thinking than almost anybody else. [...] I have reason to say that it probably should be called a Kaldorian revolution, not for anything which is connected with Kaldor's name, but what spread it was really Lord Beveridge's book on full employment, and that was written by Mr. Nicholas Kaldor and not by Lord Beveridge, because Lord Beveridge never understood any economics."

Some implications to the long-run analysis of Keynes' principle of effective demand (i.e., that investment determines savings derived from income variation via the marginal propensity to save), which emerged in the early 1930s, were worked on by Roy F. Harrod's path-breaking "An Essay in Dynamic Theory" (1939). The same dynamic instability theory was developed and extended independently a few years later by the Russian American economist Evsey Domar (1946) in the context of the post-Second World War secular stagnation thesis propagated by the "American Keynes" Alvin Hansen (1944, part III), his Ph.D. advisor at Harvard University.[3]

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[2] In Harold Wilson's government (1964-70), Kaldor co-authored the Selective Employment Tax (SET) target to tax employment in the service sector and subsidize employment in the manufacturing sector. In addition, as a world-leading tax expert, Kaldor advised several other countries. For example, in the 1950s he was invited by the Prime Minister of India to design an expenditure tax system.

[3] Hansen advocated an active fiscal policy to counter-weight the secular tendencies to stagnation in the twentieth-century United States. These were the diminishing population growth, closure of the American frontier, and declining productivity gains due to technological progress. Domar demonstrated the conditions required for

Keynes' short-period income and employment determination analysis ignored the dual character of the investment process, investment both determines present income (present aggregate demand) and increases future productive capacity (future aggregate supply). As Joan Robinson wrote in *The Generalisation of the General Theory* (1979, p. 3), "Keynes' *General Theory of Employment* is an application to output as a whole of the analysis developed by [Alfred] Marshall of the short-period equilibrium of a particular industry. [...] Output is limited for the time being by the existing capital equipment of the industry."

The attempt of generalizing the *General Theory* beyond the walls of short-period aggregate demand with given capital stock and fixed prices was largely a challenge to the very foundations of neoclassical marginal productivity theory based on factor substitution and diminishing returns. Something that Keynes himself had accepted at least partially from his teacher Marshall, for instance, in the second chapter of *The General Theory*. In particular, as the Cambridge capital controversy famously exposed (a controversy in which Kaldor himself was a protagonist), it was a challenge to the existence of a decreasing monotonic function between the aggregate quantity of capital and interest rates. In other words, an inverse relationship between capital intensity and distributive shares.

## II. A LOST GENERATION OF HAYEKIANS? KALDOR AND THE LONDON SCHOOL OF ECONOMICS (LSE)

In 1981, Hayek and Kaldor exchanged two letters concerning a dispute over Austria's economic picture. Answering Hayek, Kaldor wrote: "If you talk about the 'lost generations of Keynesians,' what about the (even older) 'lost generations of Hayekians' (Like myself!) who believed in *Prices and Production*?" (Ingrao and Ranchetti, 2005, p. 383). This resentment and unfriendly tone marked their mature personal relationship. But it was not always like that. In 1925, Kaldor was enrolled in the Humboldt University of Berlin. In April 1927, he departed for the London School of Economics (LSE) as a visiting general student, officially enrolling for the B.Sc. degree in Economics in October. Until his graduation with first-class honors in 1930, Kaldor attended lectures by, just to mention a few, Hugh Dalton, John Hicks, Allyn Young, and Lionel Robbins.

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Hansen's thesis and proposals (active fiscal policy, which resulted in what Domar called induced investment) to be valid.

In 1927, the American Young was brought by Beveridge from Harvard to LSE to substitute Edwin Cannan, who retired one year before, as the Chair of the Economics Department. At the height of his influence and intellectual powers, Young was the dominant figure in Kaldor's second year at the School, while Robbins exerted a major influence on Kaldor's third and last year. In December 1928, Young had published in the *Economic Journal* his famous article on "Increasing Returns and Economic Progress" (1928). In Kaldor's (1986, p. 4) opinion, Young was his "first real teacher in economics, albeit for a brief period," and caused him a lasting and profound impression. It was due to Young that Kaldor inherited "a basic distrust of abstract systems *per se*, and an awareness of the need to adapt the tools of theoretical analysis to the practical problems which they are intended to illuminate."

However, with Young's sudden death from pneumonia in the winter of 1928-9, Robbins was appointed to the position. Robbins was "young, flamboyant and enthusiastic." It was natural and inevitable, Kaldor (1986, p. 4) recollects, that Robbins' first pupils "should fall completely under his spell." Robbins was very "much influenced by his contacts with Viennese economists, mainly von Mises," and the Lausanne general equilibrium approach. His lectures followed closely the formulation given by Phillip Wicksteed, Wicksell, and Frank Knight's *Risk, Uncertainty, and Profit* (1921).[4] The neoclassical theoretical keystone in this presentation is the generalized marginal productivity theory of distribution *à la* Wicksell and Wicksteed. In Kaldor's (p. 5) view, Robbins absorbed this theory "with the fervency of a convert and propounded it with the zeal of a missionary."

As a Robbins' protégee, Kaldor's first publications were in the context of a two-year research studentship at LSE where, amongst other things, he went to analyze the economic "Problems of the Danubian Succession States." In researching for his project, Kaldor spent the summer term of 1931 (beginning in May until the end of July) at the University of Vienna as a visiting student. While in Vienna, Kaldor apparently joined to the so-called *Geist Kreis*, a circle composed of young scholars created by Hayek, Gottfried Haberler, and Oskar Morgenstern - with the participation of Alfred Schultz, Fritz Machlup, Felix Kaufmann, Karl Menger, Erich Voegelin, and others. Many of these were also members of the *Mises Kreis*, the continuation by Ludwig von Mises of the famous seminar held by Böhm-Bawerk. It is presumed that Kaldor and Hayek had been introduced to each other by Robbins before this summer period in 1931.

[4] Knight's book was based on his Ph.D. dissertation at Cornell University under the supervision of Allyn Young.

In December 1930, Kaldor wrote to Hayek regarding his own offer to translate Hayek's first book, *Geldtheorie und Konjunkturtheorie* (1929a). Hayek thanked Kaldor for his willingness to translate the book into English and made the arrangements for the translation under Robbins' supervision. The book was translated by Kaldor and Honoria M. Croome and published in 1933 as *Monetary Theory and the Trade Cycle* (1933a). Hayek's main goal in this book was to integrate the study of business cycles and industrial fluctuations within a theoretical equilibrium structure. This effort contrasted with the historicist and empirical approach expressed by Wesley Claire Mitchell. Hayek had entered into contact with this approach during his 1923-4 travel to the United States, where he sat in Mitchell's "Types of Economic Theory" class at Columbia University. In 1928, Hayek (1928) had just published his innovative paper on intertemporal equilibrium as an attempt to solidify a business cycle *theory*.

Hayek sought to explain economic cycles as equilibrium phenomena, i.e., as a consequence of the logic of action by economic agents, drawing from the work of the Swedish economist Knut Wicksell and his mentor Mises. *Geldtheorie* was a product of his initial efforts to enter the German-speaking academic world. To qualify for his *Habilitation*, which allowed a teaching position at the University of Vienna, Hayek had to write a book and make a public defense in a chosen subject related to the book. The subject of his habilitation lecture to *Privatdozent* at Vienna was "*Gibt es einen 'Widersinn des Sparens*?" (1929b) published in the first volume of *Zeitschrift for Nationalökonomie* in June 1929. The paper was translated by Kaldor and Georg Tugendhat as "The Paradox of Savings" (1931a) and was published in *Economica* in May 1931.

The fact that both the translations of *Geldtheorie* and "*Widersinn des Sparens*?" into English were made by Kaldor jointly with other contemporary students at LSE suggests that Robbins was the mind behind the endeavor. Robbins was fluent in German and widely read and acquainted with the Continental economic literature. He was impressed with the critique exposed in "The Paradox of Savings" of some very influential pre-Keynesian American underconsumption theories championed by William Trufant Foster and Waddill Catchings. A similar intellectual attempt, but in terms of monetary theory, had been made by no one other than Keynes himself in the 1920s within the context of a deflationary post-World War I Britain. This led Robbins to suggest to Beveridge, the long-time director of LSE, that Hayek should be invited to give four advanced lectures at the London School of Economics in the lent term of 1930-1.

"Hayek's triumphal entry on the London stage with his lectures on *Prices and Production,*" as Ludwig Lachmann (1982, p. 630) writes, was stunning. Soon after the lectures, Lachmann continues, "all important economists there [at the LSE] were Hayekians." In his monumental *History of Economic Analysis* (1954, p. 1120), Joseph Schumpeter writes that Hayek's account of the Austrian business cycle theory in *Prices and Production* (1931b),

> "on being presented to the Anglo-American community of economists, met with a sweeping success that has never been equaled by any strictly theoretical book that failed to make amends for its rigors by including plans and policy recommendations or to make contact in other ways with its readers' loves or hates. A strong critical reaction followed that, at first, but served to underline the success, and then the profession turned away to other leaders and other interests. The social psychology of this is interesting matter for study."

In Ronald Coase's (1982, pp. 8-9) words, at the time a student of the Bachelor of Commerce under Arnold Plant's circle at LSE, the lectures

> "were undoubtedly the most successful set of public lectures given at LSE during my time there, even surpassing the brilliant lectures [Jacob] Viner gave on international trade theory. The audience, notwithstanding the difficulties of understanding Hayek, was enthralled. What was said seemed to us of great importance and made us see things of which we had previously been unaware. After hearing these lectures, we knew why there was a depression. Most students of economics at LSE and many members of the staff became Hayekians or, at any rate, incorporated elements of Hayek's approach in their own thinking. With the arrogance of youth, I myself expounded the Hayekian analysis to the faculty and students at Columbia University in the fall of 1931."

After the success of the lectures, published in *Prices and Production* (1931b), Beveridge invited Hayek to spend one year as a visiting professor at LSE using the long-vacant Tooke Chair. In contrast, however, Hayek's seminar delivered at Cambridge was received in a more skeptical light (cf. Kahn, 1984, p. 184; Robinson, 1978, pp. 2-3). With the refusal of Jacob Viner and

Hubert Henderson to take the Tooke Chair, the Chair was offered permanently to Hayek in 1932. In his book, Hayek initially describes the working of a barter economy adopting Böhm-Bawerk's stationary general equilibrium state. Hayek then analyzes the effects of an intertemporal preference change, that is, the transition to a more or less roundabout method of production. In this endeavor, he employs the notion of intertemporal equilibrium under perfect foresight merged with his views on the mechanics of a capital-theoretic barter economy.

In *Monetary Theory and the Trade Cycle* ([1929] 1933a), a barter economy is characterized by a high price-adjustment velocity to changes in external data. Hayek argued that the standard equilibrium theory cannot explain the business cycle or any kind of disequilibrium phenomena. Indeed, a satisfactory explanation of the business cycle, Hayek sustains, can only be found in an endogenous generating and propagating mechanism of disequilibrium. And this mechanism is money. Therefore, a satisfactory investigation into business cycle theory can only be accomplished by the integration of monetary theory into business cycle research, thus the name of the book. In Hayek's judgment, the only instruments available to analyze business cycles (the systematic errors made by entrepreneurs) are the methods of static analysis, in particular the notion of intertemporal equilibrium. This does not necessarily mean equilibrium as a stationary state, since stochastic, exogenous, and particular fluctuations or errors can be sufficiently explained by the adjustments process to irregular changes in external data.

Hayek ([1929] 1933a, pp. 69-70) seems to assume a perfect foresight environment in his delineation of a barter economy, arguing that we "have to assume that the price which entrepreneurs expect to result from a change in demand," which includes the dates and quantities of consumers' goods for which investment is destined, "will more or less coincide with the equilibrium price." No systematic error can be made by the entrepreneurs since they "will generally be in a position to estimate the price that will rule after the changes have taken place." The expected price "is just as likely to be lower than the equilibrium price as to be higher." Therefore, "on the average, it should more or less coincide, since there is no reason to assume that deviations will take place only in one direction." After drawing the intertemporal effects in his benchmark economy, Hayek goes on to contrast this case with a monetary economy in which divergences between the money and natural interest rates transmit false price signals to

entrepreneurs, resulting in a failed intertemporal transition to a more roundabout method of production.[5]

Kaldor's initial publications were products derived from his research studentship dealing with the economic problems of Danubian succession states. In fact, although never submitted, Kaldor's planned Ph.D. dissertation was on this topic, entitled "Commercial Policy of the Danubian States after the War." In October 1932, Kaldor published in the *Harvard Business Review* his first paper on "The Economic Situation of Austria" (1932e) employing mainly an Austrian approach to the industrial fluctuations in the region. On the occasion already at Harvard, it was Haberler who initiated the submission of Kaldor's paper, initially rejected by Keynes in the *Economic Journal*. The Austrian influence can also be clearly seen in Kaldor's (1932a) first letter to *The Times* in March 1932 dealing with the dominance of farming in Danubia and in four anonymous articles published between May and June in *The Economist* on "The Danubian Problem" (Kaldor, 1932b, d).

Reviewing Emil Lederer's 1931 book on technological unemployment, Kaldor (1932c, p. 195) argued that unemployment could only be due to the money wage downward rigidities, a "monopolistic interference with the price system" by trade unions. In his review of Carl Landauers's 1931 book *Planned Economy and Market Economy*, which advocated an early German *Marktsozialisten* solution, Kaldor (1932d, p. 279) maintained that Mises' economic calculation problem still would be not resolved in the market socialism "competitive" solution. "Even if we assume that a 'free market' for consumption goods can be preserved, the methods of producing these goods will have to be decided arbitrarily; as the Socialist producer cannot, even if he tried to, find out the true displacement [i.e., opportunity] costs of the factors of production. This problem, which emerged as soon as the conception of 'real costs' was abandoned, has so far proved insoluble."

At the time that Kaldor was appointed Assistant Lecturer at LSE, in 1932, he could fairly be classified as an adherent of the Austrian approach. In his recollections, Kaldor (1986, p. 7) admitted that "[i]n 1932 I was much under the influence of the views not only of Robbins but

[5] As Hicks (1967, p. 260) put it: "In Wicksell, the 'Cumulative Process' is a matter of prices. When the 'market rate' of interest is reduced below the natural rate, prices rise. Nothing is said about the movement of quantities (inputs and outputs). On the bearing of his construction on the causation of Trade Cycles, Wicksell is open-minded. Hayek was asking the question: what happens to quantities in a Wicksellian process? He took his model very 'pure': much purer than Wicksell himself had been accustomed to take it. Prices (all prices) are perfectly flexible, adjusting instantaneously, or as nearly as matters. Price expectations are not introduced explicitly, for in 1930 their day had not yet come."

also of Hayek." As Hayek (1994, p. 86) notes, Kaldor "occasionally freely admitted that in his beginnings he was a Hayekian." In the early 1930s, therefore, Kaldor could be called an Austrian economist. What changed? In Hayek's (ibid.) impression, "it was Keynes' *Treatise* which convinced him, and got him around the other side. And he worked closely with Beveridge. He wrote Beveridge's book on unemployment." However, Kaldor declared that "[m]y enthusiasm for the doctrine of Professor Hayek had already suffered a relapse when as a first year research student I undertook to translate his '*Gibt es einen 'Widersinn des Sparens'*?' article into English, and in the course of struggling with the translation detected various gaps and flaws in the argument." Nevertheless, this state of affairs was only really subverted in 1933 due to two main reasons related to the role of capital, interest, and equilibrium in a dynamic economy.

First, Piero Sraffa's (1932a) review of Hayek's *Prices and Production* was a strong blow to the initial intellectual euphoria created by the lectures at LSE. Sraffa argued that outside the stationary equilibrium there are as many natural interest rates as there are commodities. There are a set of rates in which some will be above, and some will be below, the money rate. Thus, monetary neutrality in Wicksellian terms is far from unproblematic. Second, Hicks introduced Kaldor to the work of the Swedes, particularly Gunnar Myrdal. Kaldor and Hicks were close friends at the time. Kaldor (1983, p. 7) "spent many hours in discussion in our neighbouring flats, on Sunday walks, or occasionally on a Continental holiday." Kaldor (ibid.) writes that

> "Hicks (unlike me) was an indefatigable reader of books in at least three foreign languages, and it was owing to him that I was put on the track (among others) of the younger Swedish economists, particularly Myrdal, who first made me realise the shortcomings of the 'monetarist' approach of the Austrian School of von Mises and von Hayek and made me such an easy convert to Keynes after the appearance of the *General Theory* three years later."

Both Hicks and Kaldor read the German revised version of Myrdal's "Der Gleichgewichtsberiff als Instrument der Geldtheoretischen Analyse" (1933) published in an "omnibus" book, *Beiträge zur Geldtheorie* (1933b), edited by Hayek. Indeed, they probably read the original German manuscript when Myrdal was visiting the LSE in 1933. Hicks (1934) wrote a very positive review of the book in the November 1934 issue of *Economica*. Myrdal's original article first

appeared in 1932 in Swedish under the title "Om penningteoretisk jämvikt" (1932) in *Ekonomisk Tidskrift*.

Originally, the space in Hayek's *Sammelband* book was destined for a contribution by Erik Lindahl but he was unable to deliver the submission in time and suggested Myrdal as a contributor. Although Hayek opposed Myrdal's argument and its implications, he reluctantly accepted it. Finally, in 1939, an English book translation appeared as *Monetary Equilibrium* ([1933] 1939) with some modifications, after Keynes' prophesied revolution. Myrdal's short book, Kaldor (1986, p. 7) notes, "contained many of the features of Keynes' system particularly as regards the role of expectations in investment and the relation of the marginal efficiency of capital to the rate of interest."

## III. BUSINESS CYCLE, CAPITAL THEORY, AND EQUILIBRIUM

In late October 1930, the long-awaited *A Treatise on Money* (1930) by John Maynard Keynes was finally published. The book received great criticism from the contemporary audience. Even within Cambridge corridors, the *Treatise* was widely criticized by established figures such as Arthur C. Pigou and Dennis Robertson. In addition, it was also criticized by more sympathetic younger figures such as the members of the Cambridge Circus around Keynes, composed of Sraffa, Kahn, Joan and Austin Robinson, and James Meade. Meanwhile, at LSE, Robbins had Hayek in charge of a review of the *Treatise* for *Economica*, which part I was published as "Reflections on the Pure Theory of Money of Mr. J. M. Keynes" (1931c) in August 1931. This, of course, was the beginning of the famous controversy between Keynes (1931) and Hayek (1931d, 1932a). In his early response to the review in the November issue, Keynes attacked Hayek's *Prices and Production* (1931b), published in September 1931, and ultimately asked Sraffa to do a review of the book for the *Economic Journal*.

Hayek's main critique of the *Treatise* is that Keynes attempted to structure a business cycle theory based on monetary causes drawing from Wicksell's cumulative process without working first in the real-based capital infrastructure of a decentralized economy within a relative price coordination system. In his first book on *Value, Capital, and Rent* ([1893] 1954), Wicksell integrated Böhm-Bawerk's capital theory and its average production period into a general equilibrium framework, in what became known as the neoclassical synthesis of the Austrian

theory of capital. As Robbins wrote in the introduction of the first volume of Wicksell's *Lectures on Political Economy* ([1901] 1936, p. xii), "by a judicious selection of the best elements in earlier theories he achieved a reformulation of this part of the theory of production from which, it is safe to say, all future work in this field which aspires to be taken seriously must commence."

However, Wicksell's cumulative process developed and worked in his *Geldzins und Güterpreise* (1898) is only a matter of the effect of changes in the interest rate on prices in the sense of a general price level. Thus, the sub-title of the book, *Interest and Prices: A Study of the Causes Regulating the Value of Money* ([1898] 1936). As such, the Wicksellian natural (or real, synonymously used by Wicksell) interest rate is defined as the rate that maintains an average price level index stable absent productivity gains. It is the rate that equilibrates at the same time the commodities market (savings equal to investment) and the loans fund market (money supply equal to the demand of loanable funds), a condition that translates into the equilibrium between total supply and aggregate monetary demand.

There is, as Wicksell ([1898] 1936, p. 102) concludes, "a certain rate of interest on loans which is neutral in respect to commodity prices, and tends neither to raise nor to lower them. This is necessarily the same as the rate of interest which would be determined by supply and demand if no use were made of money, and all lending were effected in the form of real capital goods. It comes to much the same thing to describe it as the current value of the natural rate of interest on capital," i.e., the marginal productivity of the roundabout average period of production. In this way, Wicksell unifies the so-called classical dichotomy between the determination of relative prices by marginal substitutions rates and the general price level by the classic equation of exchange with the notion of individuals' real-cash balances. Thus, Wicksell linked general equilibrium analysis with monetary theory, redefining the mentioned dualism in terms of divergences between the aggregate monetary demand and the total supply.

In *Theory of Money and Credit* ([1912] 1934), Mises amalgamated the Wicksellian cumulative process with movements in the heterogeneous capital structure in a monetary-caused but real-based business cycle theory. This theory was refined and developed by Hayek in his early works (cf. for the evolution of this theory the first lecture in Hayek, 1931b). Where Mises departed from Wicksell, and in this sense from Wicksell's view of business cycle, was on, first, the reaffirmation of the Richard Cantillon's effect which states that the new credit (or money supply) created in the cumulative process enters into the economy in a particular and temporal

idiosyncratic way, a route that modifies the relative price structure and endowments. Second, Mises argued that the disproportionate impact of changes in the quantity of money and credit also affects the capital structure composition since different marginal substitution rates and spending flows derived from distinct individuals' real-cash balances are now effective.

Wicksell is silent on the implications, if any, of his cumulative process to business cycle theory. In general, he tended to see the cumulative process as essentially a short-period phenomenon and the business cycle as a long-period occurrence. Indeed, Wicksell dismisses any necessary connection between the cumulative process and business cycles, being critical of Mises' Austrian business cycle theory (see Wicksell's [1914] review of Mises' 1912 book). Wicksell supported a real theory of the business cycle. As Mauro Boianovsky (1995, p. 378) carefully documented, Wicksell's business cycle "is explained by oscillations in the natural rate alone" (originated by demographic factors, irregular technical progress, and psychological elements).

However, Axel Leijonhufvud (2001, p. 5) argues that in *Geldzins* Wicksell is much more ambivalent on how the cumulative process could distort relative prices and allocations, so that "[i]t is not difficult to see how the book could stimulate work along theoretical lines with which its author was not much in sympathy." For instance, Wicksell ([1898] 1954, p. 96) describes something along the lines of an overinvestment consequence of the cumulative process, giving an example that results in a one-third rise in the relative price of capital goods. "An abnormally large amount of investment will now probably be devoted to durable goods. There may result a relative overproduction of such things as houses and a relative underproduction of other commodities." He also describes a notion similar to the doctrine of forced savings, saying that "it can be seen that credit institutions, by supporting long-term enterprises, can to some degree *force* the necessary capital out of the public" (p. 111). [6]

The Austrian business cycle theory is concerned with the proper capital micro-foundations and their movements caused by relative prices regarding the macro-phenomena of industrial fluctuations.[7] This contrasts with the aggregate approach that Keynes employed in his *Treatise*,

[6] "While Wicksell liked to stress that relative prices and the price level were determined by entirely different forces," Leijonhufvud (2001, p. 5) sustains, "the book is full of pieces of analysis showing how a discrepancy between the natural and the real rate would distort relative prices and allocation. One can, for instance, imagine Mises or Hayek reading passages and finding ready-made elements for the overinvestment hypothesis."

[7] In fact, the Austrians since Menger and Friedrich von Wieser have a more complex view of capital which was translated in the stylized formal simple model of Böhm-Bawerk. For this tradition, capital is seen as a multitude of heterogeneous goods integrated within a broader complementary macro-structure of value imputation. Such a complex structure is both a cause and consequence of the sustained level of productive specialization and knowledge dispersion in an advanced industrial economy. Capital is not a homogenous mass that can be molded, moved, and

as exemplified by the Fundamental Equations and its average macroeconomic definitions (e.g., average entrepreneurial profit or losses). Indeed, it also contrasts in some sense with Wicksell's (and Keynes') theoretical corollary regarding the stabilization of the price level.

In a famous debate in the pages of the *Ekonomisk Tidskrift* (1906-9), the Swedish economist David Davidson sustained substantial criticism of Wicksell's corollary and proved that under rising or falling general productivity a monetary banking policy aimed at stabilizing the price level would have disturbing results. In these circumstances, i.e. when productivity changes, the neutral monetary policy requires that the consumption price level moves inversely to the changes in productivity. Thus, for instance, keeping the current money rate equal to the natural rate in a context where general productivity is rising (i.e., the price level is falling) is destabilizing in the sense that in reality it implies an expansionist banking policy. This is so because the money rate is the real rate plus expected inflation or deflation.

In the end, the controversy between Wicksell and his contemporary Davidson ended on the exact place of assumptions made regarding the expected inflation or deflation by entrepreneurs, i.e. the expectations or anticipation of future prices.[8] Afterwards, Lindahl absorbed and elaborated on Davidson's monetary policy. More importantly, these questions concerning anticipations would be re-stated by Myrdal's critique of Wicksell and authors drawing more indirectly (such as Robertson and Keynes) or directly (such as Mises and Hayek) from Wicksell. As the LSE economist Brinley Thomas (1936b, p. 293) pointed out in his 1936 review of Wicksell's two-volume *Lectures on Political Economy*[9] and *Interest and Prices* for the *Economic Journal*, after emphasizing that Wicksell's money and natural rates construction were not destined as a theory of the trade cycle, Wicksell "failed to realise that the rate of return on capital in a monetary economy needs very careful definition if it is to be an independent element which

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reshaped without any economic (opportunity) cost. Capital goods are not totally and only determined by their objective physical properties but by the subjective and creative imaginary perception of the entrepreneur. There are non-trivial costs of changing, repositioning, and modifying capital in an organic complementary structure.

[8] Davidson's point is, in addition, applicable to Irving Fisher's plan for stabilizing the dollar. In fact, Wicksell's critical treatment of Fisher's plan in his *Lectures on Political Economy* was a consequence of Davidson's line of reasoning. It is interesting to note that in the 1960s and 1970s the Fisher's (1896) hypothesis - which states that the Thomas Tooke's stylized fact of comovement of interest rates and the price level was explained by the expected inflation or deflation on the nominal interest rate formula - was revived by monetarists but implying that the real rate would always be at the natural rate. Thereafter, the incorporation of the Fisher equation in macroeconomic models, especially in the rational expectations form, contributed to the eclipsing of Wicksellian themes. Already in *Geldzins* Wicksell discussed the Fisher hypothesis and rejected it.

[9] The *Lectures* were translated from Swedish by E. Classen, thanks to the initiative of Robbins. Volume I is concerned with and has the subtitle *General Theory*, volume II deals with *Money*. Robbins also edited and wrote the book's introduction.

can be compared with the loan rate of interest. It must be translated into terms of value productivity; and Professor Myrdal has shown what this involves."

Business cycle theory deals with economic dynamics and economic dynamics deals with imperfect foresight and uncertainty regarding future prices and quantities. Wicksell ([1906] 1935, p. 185) had assumed that "in general, the individual business man will make his calculations for the future and so fix his demand for labour, raw materials and credit on the basis of *current* prices." And current prices in this sense translate for a stationary state. In this vein, Thomas (1936b, p. 293) writes that "[t]he same assumption lies behind most of Dr. Hayek's reasoning in *Prices and Production*. This simple hypothesis is quite inadequate for an interpretation of industrial fluctuations. The recent work of Swedish economists suggests important possibilities in this field." We will return to this important critique below.

The controversy between Hayek and Keynes in 1931 was a controversy regarding the heritage of the Wicksellian legacy, in what Leijonhufvud (1981) called the "Wicksell connection." Hayek's (1931c, p. 279) review of Keynes' *Treatise on Money* is very clear on this point saying that "[i]n Wicksell's system these [cumulative processes] are necessary outgrowths of the most elaborate theory of capital we possess, that of Böhm-Bawerk. It is *a priori* unlikely that an attempt to utilise the conclusions drawn from a certain theory without accepting that theory itself should be successful."

It is in this context that Sraffa's review of *Prices and Production* and Myrdal's critique of Wicksell's conditions of monetary equilibrium are relevant. Indeed, in Lachmann's (1986, p. 226) opinion, "Sraffa's review was an onslaught conducted with unusual ferocity, somewhat out of keeping with the tone ordinarily adopted by reviewers in the *Economic Journal*." According to Sraffa (1932a, 1932b), there is no qualitative difference between *ex ante* voluntary savings and *ex post* forced savings. The only difference is in distribution terms, i.e., from which economic participants new savings appropriate to the new amount of investment will be generated. Indeed, in both cases the necessary savings will be generated in the same process through income variation if the transition to the new structure of production is completed.

This point was argued before by Kahn in private correspondence to Hayek, that is, that savings always adjust *ex post* to aggregate investment. The question is regarding the abortion or completion of the traverse to the new equilibrium characterized by a new capital structure. In a short-period analysis, given the stock of capital and assuming only labor unemployment, as

Keynes did in *General Theory*, the question of a traverse to the new equilibrium is not posed. An increase in investment will always generate the corresponding amount of savings via income-increasing adjustment (with the marginal propensity to save of this new income) as unemployed labor is incorporated into production and idle capital goods.

However, Sraffa went further. In a world with no money, he sustained that even in the long run with capital variation the question of traversing to a new intertemporal equilibrium that Hayek posed would not be a problem. Outside stationary equilibrium, Sraffa argued that the natural rate of interest is a fictitious notion. In his view, Hayek misused the Wicksellian long-run natural interest rate in the construction of his cycle theory. Outside the long-run equilibrium, Sraffa continued, there are as many natural rates as commodities so the question of a supposed traverse to a new equilibrium is misplaced. There would be multiple equilibrium positions compatible with the same physical capital structure and capital goods. Therefore, once the long-run equilibrium is perturbed, the equilibrium position itself would be undetermined.

Hayek (1932, p. 245) conceded Sraffa's point that there would be as many natural rates as there are commodities, but he maintained his ground that all these would be equilibrium rates. "[T]here would be *no single rate*," but "there might, at any moment, be as many 'natural' rates as there are commodities, *all* of which would be *equilibrium rates*," in an intertemporal equilibrium view. Sraffa was criticizing the Austrian theory of capital which connects a notion of intertemporal equilibrium between consumers' time preference - a rising waiting function rate for the ratio between goods in the present (consumers' goods) and in the future (capital goods) - and the average length of production, which at the margin gives us the marginal productivity of capital of the roundabout period of production. In equilibrium, the marginal productivity of capital is equal to the consumers' intertemporal preference (the waiting rate), this rate is the natural interest rate. For Hayek, divergences between money and natural interest rates implied misallocation in the real capital structure from intertemporal equilibrium - which was the cause of business cycles.

However, Wicksell's neoclassical synthesis of the Austrian capital theory derived from Böhm-Bawerk had some restricted assumptions. Wicksell assumes (i) a stationary state (i.e., a long-run equilibrium), (ii) a uniform one-year production period, and (iii) the technical impossibility of lengthening or shortening the investment period. Wicksell then proceeds to suppose a rise in the natural rate caused by some exogenous factor (e.g., a rise in the rate of

technological progress or population growth) while the money rate remains constant to argue that an upward cumulative process would persist until the gap between the two rates continues. As Thomas (1936b, p. 292) noted, Lindahl (1930, pp. 36-7) had already called attention that "if the investment period is technically rigid, there can be no 'natural' rate of return on capital which is independent of the loan rate of interest." The notion of the natural rate in Wicksell's cumulative process is grown from his capital theory that assumes only one variable factor of production and one product, therefore the proportion of output to input varies directly with the period of consumers' waiting.

In the second Swedish edition of his *Lectures,* Wicksell ([1906] 1935, pp. 198-9) admitted the possibility that lowering the loan rate could depress the natural rate so that the cumulative process would cease itself. He notes that a lower rate unconditionally demands more real capital and, thus, increased savings, even if involuntarily due to the restriction of consumption by higher prices of those economic agents who had fixed money incomes. But this same process causes the diminution of voluntary savings due to a lower return rate. Which force will prevail depends on the capacity of production to absorb the new capital (i.e., new investment) without a reduction in the return of capital. "But if the former influence prevails, and if production is unable to absorb unlimited quantities of new capital without a reduction in net yield, then the incipient rise in prices, though it would certainly not recede, might yet be arrested, unless the banks reduced their rates still further."

As Thomas (1936b, p. 292) observed in his review, "a lowering of the money rate brings about a redistribution of income in favour of classes whose ability and willingness to save are relatively high. On this account, therefore, there will be a rise in voluntary saving, while, at the same time, no reduction need necessarily follow a lowering of the rate of interest." This, of course, is part of Sraffa's argument discussed above. Thomas continues saying that, echoing Myrdal and the Swedes, "[t]he upward swing can for some time be fed out of this additional saving. Whether it will develop into an inflationary boom depends to a great extent on the state of entrepreneurs' expectations."

Sraffa's criticism of the Wicksellian long-run natural rate is also a critique of Keynes' *Treatise* foundations. Indeed, in the famous pivotal chapter 17 on "The Essential Properties of Money and Interest" in *General Theory*, Keynes abandoned his earlier notion of a long-run natural interest rate and developed his new theory of interest based on the liquidity preference drawing from

Sraffa's argument against Hayek. Since out of the long-run equilibrium position there are many and different natural rates as there are commodities and capital goods (i.e., many different spots and forward prices for all commodities and heterogeneous capital goods) the greatest of the own-rates is the one that at the margin sets the limit to the level of investment (thus, employment and income). And this rate will always be the money rate due to its low carrying costs and liquidity premium.

This allowed Keynes to introduce the essential role of expectations in a radically uncertain environment on the determination of the long-run interest rate in the bonds market. There is no longer a single Wicksellian natural interest rate to conform to some kind of intertemporal equilibrium between consumers' time preference and marginal productivity of capital. Instead, what we find is an extremely fluid expectational and conventional environment where multiple equilibrium positions can arise (see Telles, 2022).

## IV. THE SWEDISH CONNECTION: MYRDAL'S CRITIQUE, EQUILIBRIUM, AND EXPECTATIONS

In the second volume of his *Lectures* dealing with money, Wicksell ([1906] 1935) defines the natural rate as being "the rate at which the demand for new capital is exactly covered by simultaneous savings." That is, the natural rate is the rate at which the *ex ante* investment (demand for new capital) is exactly covered by simultaneous *ex ante* savings. Nevertheless, Wicksell did not work out the implications of his new definition (e.g., which necessarily involves anticipations of future prices) to divergences of the natural and money rates. For Wicksell, three conditions to monetary equilibrium are necessary. Namely, (i) the market rate of interest should be equal to the natural rate defined as the technical marginal productivity of the average period of production; (ii) the loans fund market should operate as if funds were lent *in natura*, i.e., "as if no use were made of money, and all lending were effected in the form of real capital goods;" (iii) the price-level should be constant.

Myrdal's "The Equilibrium Concept as an Instrument of Monetary Analysis" ([1932] 1933) is a devoted, detailed, and immanent critique of Wicksell's analysis, in particular, his three conditions to monetary equilibrium. In his 1934 review, Hicks (1934, pp. 480-1) classified Myrdal's little book as "to me quite the most exciting work on monetary theory which has appeared since Mr.

Keynes' *Treatise* and Professor Hayek's *Prices and Production*." Independent of Myrdal's conclusions, Hicks argues that it "marks a very definite step in advance. It is even one of those books one feels loath to criticise, for fear that one's criticisms may perhaps deter some reader from examining the book itself - and that would be a disaster."

It was natural for Myrdal and others from Sweden to address and develop their theories starting from Wicksell's framework. Indeed, in the 1933 German version, Myrdal ([1933] 1939, pp. 8-9) complains that in England Wicksell's framework was highly neglected and misunderstood. He mentions Robertson's *Banking Policy and the Price Level* (1926) as an important and "significant little book." However, Robertson, "too, obviously lacks a thorough knowledge of Wicksell and his pupils, and he has therefore been forced unnecessary to think for himself." Moreover, Myrdal (ibid.) continues, "J. M. Keynes' new, brilliant, though not always clear, work *A Treatise on Money*, is completely permeated by Wicksell's influence. Nevertheless Keynes' work, too, suffers somewhat from the attractive Anglo-Saxon kind of unnecessary originality, which has its roots in certain systematic gaps in the knowledge of the German language on the part of the majority of English economists."

Of course, this was emphasized by Hayek in his position against Keynes. Until 1933, as Hicks (1934, p. 479) pointed out, only two streams of thought originating from Wicksell's *Geldzins* were presented and "generally familiar to the English reader. There is the school of Professor Mises and Professor Hayek; there is the school of Mr. Keynes. It is perhaps fortunate that these do not in reality exhaust the list."[10] This is relevant because it showed that a Wicksellian-inspired theory could be very different from the business cycle theory propagated by Mises and Hayek.

After re-stating Wicksell's conditions to monetary equilibrium, Myrdal ([1933] 1939) submits each of the three conditions to several criticisms. First, following Davidson's argument, he argues that the equality of the money and natural rates and money neutrality does not necessarily imply the price level being unchanged, i.e., conditions (i) and (ii) do not necessarily imply (iii). Second, following Lindahl's steps, Myrdal states that the seemingly objective and technical quality of the equilibrium natural rate is derived exclusively from the simplicity and irrealism of the assumptions that constituted Wicksell's theory of capital, namely, one original factor of

[10] Hayek's *Sammelband* book in which Myrdal's work in German appeared was intended to collect summarized works already published in the authors' own language which were not widely read and known by the economics profession. In this sense, it presented neo-Wicksellian works and developments besides the familiar to the English reader. In particular, and perhaps the most important of these foreign developments, were the ideas naturally advanced by Swedish economists such as Davidson, Lindahl, and Myrdal.

production and one finished good. Indeed, as Hicks (1934, p. 481) notes, this is "[a]n argument made familiar to us in England by Mr. Sraffa" in his review of Hayek's *Prices and Production*.

Once the unrealistic hypothesis of the Austrian theory of capital is dropped, e.g., allowing for a multiplicity of finished products, Myrdal argues that the natural rate of capital goods can only be understood as an expected rate of yield or profit, in monetary terms. The natural rate can only be interpreted as the marginal value product, the result of the marginal physical product of the factor multiplied by the expected average revenue or price of the product. This introduces many new elements to monetary equilibrium, especially psychological and expectational factors regarding future prices. In addition, it means the abandonment of the rigid notion of a capital structure defined by a single natural rate of interest. As Hicks (1934, p. 481) writes, "this interpretation not only makes the natural rate dependent on psychological elements (the expected course of prices), but it also raises serious difficulties about 'maintaining capital intact,'" an expression used by Hayek to design the real capital allocation in a scenario of money neutrality.

In face of these modifications, Myrdal argues that the Wicksellian first condition of monetary equilibrium translates to the equality between the value (the new, expected "natural" rate) and cost (the money rate) of production of new capital goods. This value-cost equation is dependent in both terms on the market rate of interest. Concerning the second condition, Myrdal shows that it can only be interpreted as the equality between savings and investment. Moreover, since the natural rate is the rate at which the *ex ante facto* demand for new capital is exactly covered by simultaneous savings, this equality necessarily implies the equality in the value-cost equation of the first condition and *vice versa*. Therefore, Myrdal demonstrates that divergences between savings and investment (i.e., a divergence between the value and cost of capital goods) are always fulfilled by profit and losses by the entrepreneurs.

Savings and investment can be different only *ex ante* when all the different expectations of entrepreneurs and their action plans are simultaneously aggregated. These expectations encompass, for example, expected income, looked forward and anticipated by entrepreneurs and workers. In the workers' case, these expected incomes can in general be counted since they are submitted to nominal contractual arrangements. In contrast, the entrepreneurs bear the risk and uncertainty of contracting labor and inputs for pay when there is nothing that guarantees that their expected revenue product value will be concretized. If their revenue is less than expected, they realize a loss - and, in the aggregate, savings proved to be greater than investment.

However, quantities that are registered in the bookkeeping records are quantities seen *ex post facto*. In this sense, savings and investment are always equal by definition and cannot be distinguishable due (in Myrdal's - and also in Keynes' *Treatise* - analysis) to the equilibrating role of variations on prices (profit and losses). In fact, the celebrated Stockholm terms of *ex ante* and *ex post* in Myrdal's analysis were only introduced by the German translator in 1933. A rare case of gains of clarity and understanding in translation.

Drawing from his reinterpretation of Wicksell's natural rate as a monetary yield or profit rate involving expectational and psychological elements, Myrdal concludes that any price level could be compatible with monetary equilibrium.[11] There is an indeterminateness of monetary equilibrium in relation to the price level - even if the amplitude of price level movements is limited by sticky nominal prices such as long-term contracts, wages rates, etc. This led Myrdal to abandon not only Wicksell's price level stabilization but the inverted relation between the price level and productivity gains in productivity norms to the price level defended by Davidson, Lindahl, Hayek, and others. Therefore, Wicksell's third condition of monetary equilibrium regarding the price level stability is denied.

For Myrdal, the only concept which is not touched on in his critical remarks is the Wicksellian cumulative process, implied in monetary disequilibrium. However, as Hicks (1934, p. 483) writes in his review, "at the stage he has reached, has he the right to refer back to Wicksell any longer? Just what is the precise difference between such a cumulative process and the sort of inflation which he would consider, theoretically at least, as consistent with monetary equilibrium?" Indeed, Hicks (ibid.) asks, "what is the point of Professor's Myrdal monetary equilibrium?" After this, Hicks notes that there is "nothing which altogether convinces one that the [monetary equilibrium] concept, in the form in which he has left it, remains an essential part of monetary theory."

Myrdal's critique is an imminent criticism of the equilibrium concept as an instrument of monetary analysis. Myrdal emphasizes the fundamental importance of expectations (i.e., anticipations) to the definition of the natural rate of interest. In Myrdal's hands, Wicksell probably would not recognize the natural rate as being his offspring. The internalization of expectations to the natural rate changed the whole character of a supposed unique, long-run

[11] As it is well-known, any price-level movement pattern is compatible with general equilibrium if agents have perfect foresight.

equilibrium stable rate. Any price level dynamics could be compatible with monetary equilibrium.

After reading Myrdal, Kaldor (1934b) used the *ex ante* and *ex post* analysis in his contribution to a debate that occurred in the pages of *The Economist* concerning the objective of monetary policy, namely, "Stable prices or neutral money." In a growing economy with increasing productivity, Hayek argued that aiming for general price stability was not sufficient to guarantee the equality between money and natural interest rates. In this case, the average price stability target implies a situation out of monetary equilibrium in the monetary market (the money rate is lower than the natural rate) and in the real-goods market (investment is greater than voluntary savings). Hayek ([1929] 1933a) had argued that this was precisely the case experienced by the United States in the 1920s, where the average price level stability in a productivity-increasing economy obscured the expansionist monetary policy practiced by the Federal Reserve System in that decade. A monetary expansion that culminated in the 1929 bust and the Great Depression.

Hayek (1931b, p. 126) was opposed to the aims of monetary policy guided by the "widespread illusion that we only have to stabilise the value of money in order to eliminate all monetary influences in production." Hayek's policy recommendation was for monetary policy to follow a productivity rule, in which the price level should vary inversely to the productivity gains in a growing economy (e.g., see Selgin, 1999). In Hayek's (1931b, p. 130) framework, neutral money is not necessarily equal to stable prices. Money is neutral if the economic decisions and allocations (in particular intertemporal decisions and the capital structure) are "as if they were only influenced only by the real factors."

On the other hand, Harrod (1934) argued that the equality of savings and investment is tautological and always true. In particular, this tautology is also valid in the case of a stable price level. Indeed, Harrod believed that the equality between savings and investment is compatible with any behavior of the price level. Therefore, it is also true in the case of money neutrality and stable price level. Kaldor (1934b) entered the debate in a middle-ground position between Hayek and Harrod. Using Myrdal's *ex ante* and *ex post* analysis, Kaldor (1934b) argued that the compatibility between stable prices and money neutrality depends on the correct foresight by economic agents in relation to the price level dynamic path.

In this sense, both a falling and a stable price level can preserve money neutrality if this scenario is correctly predicted *ex ante*. There are a multiplicity of equilibrium positions that

combine different price levels with perfect foresight solutions. In this scenario, any policy can be practiced without falling out of the neutrality of money if the banking policy and prices are correctly predicted. Since the natural rate of interest embodies expectations, the only way to have a monetary disequilibrium is if a divergence occurs between *ex ante* expectations and *ex post* facts.

Myrdal's monetary equilibrium was also, in part, a response to the use by Mises and Hayek of the Wicksellian cumulative process in a business cycle theory - beyond the short-period price level determination. Indeed, Myrdal ([1933] 1939, p. 32) maintained that the main purpose of his work was to "include anticipations in the monetary system." Something that the recent contributions had completely failed to do - in particular, the theses advanced by Keynes and Hayek. In both Keynes' *Treatise* and Hayek's *Prices and Production*, in his opinion, there was simply "no place for the uncertainty factor or for anticipations" in their theoretical construction. The Swedes showed that a Wicksell-inspired theoretical framework could be very different from the one propagated by the Austrians. Thus, the policy recommendations could also be radically different.

The Welsh economist Brinley Thomas introduced and spread the word of the Swedes at the LSE and in England in general. Thomas completed his Ph.D. at LSE in 1931, being appointed as Assistant Lecturer in the same year. In 1932, he was awarded an Acland Travelling Scholarship to study in Germany (for 9 months) and Sweden (for 6 months) in the period spanning 1932-4. He would return to Sweden many times thereafter. In this period, Thomas was acquainted with the Swedish developments in monetary theory and practice, mastering the advances made by Wicksell, Davidson (who had played a significant part in Swedish economic policy), Gustav Cassel, Lindahl, Myrdal, and others. Thomas propagated Myrdal's ideas on monetary equilibrium in his lectures at LSE, using the *ex ante* and *ex post* terminology[12] and soon converted Hicks, Kaldor, and George L. S. Shackle.[13]

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[12] The terms *ex ante* and *ex post* in relation to monetary analysis introduced in the German translation of Myrdal's 1932 article apparently only were written down in English in 1937 by Bertil Ohlin (1937) in his famous article debating with Keynes in the *Economic Journal*.

[13] In addition, Thomas documented the successful economic policy experience conducted in Sweden in the economic recovery after the Great War in his important 1936 book, *Monetary Policy and Crisis: A Study of the Swedish Experience* (1936). The Swedish successful experience contrasted with the German contractionist policies in the same period. In his book, Thomas also contrasted the Swedish business cycle and monetary theories drawing from Wicksell with the Austrians, suggesting that the country had a successful experience in coordinating economic policies towards the control of the economic cycle.

## V. THE LONDON REACTION: HAYEK, HICKS, AND KALDOR

Written in the spring of 1932, Myrdal's *Monetary Equilibrium* ([1933] 1939, p. 32) was a direct attack on the perfect foresight assumption. "The main purpose of the subsequent analysis," Myrdal writes, "is to include anticipations in the monetary system. A criticism of Keynes and Hayek would have to begin by pointing out the fact that in their theoretical systems there is no place for the uncertainty factor and for anticipations." In Keynes' *Treatise*, this is explicit in his Fundamental Equations equilibrium, in particular in his notion absorbed from John Bates Clark of windfall profits and unexpected losses.

In Hayek's theory, although Myrdal (p. 32) concedes that it has "the merit of a more intensive analysis of the roundabout process of production and consequently of the questions of profitability," the analysis "is stationary or quasi-stationary only." Indeed, in 1931, Hayek compared two processes of capital accumulation. One is a successful traverse between two stationary states financed by voluntary savings; the other is a failed traverse, initiated by a false intertemporal relative price and drastically interrupted in the process of plans revision. In Myrdal's (p. 33) opinion, Hayek developed an "abstract case where among other things anticipations are excluded by assumptions which are fundamental to the whole analysis."

After its publication, Robbins asked Hicks to write a mathematical appendix to Hayek's *Prices and Production*. Hicks struggled with this effort since at the core of its difficulties was the appropriate equilibrium concept to represent a disequilibrium development within equilibrium theory. Indeed, as Hayek stressed in many places, his cycle theory is only comprehensible within the notion of intertemporal equilibrium formulated in his 1928 article. This essay is the starting point for a dynamic equilibrium analysis, where the equilibrium price vector is the one in which demand and supply of different commodities at different dates are equal. Thus, to reach equilibrium, this equilibrium price vector must be anticipated by economic actors, resulting in the perfect foresight condition intrinsically connected with intertemporal equilibrium.

In this vein, in June 1933 Hicks published in *Zeitschrift fur Nationalokonomie* his first work dealing with monetary theory. It was translated into English as "Equilibrium and the Trade Cycle" and published by Robert Clower only in 1980. In this essay, Hicks tried to generalize an equilibrium notion compatible with money and its relation with the business cycle, beyond stationary equilibrium. Following Frank Knight's (1921) argument, Hicks concludes that a

positive demand for money only is justifiable under imperfect foresight i.e., under intertemporal disequilibrium. Thus, as it is well known in the case of the Walrasian general equilibrium model, monetary theory *stricto sensu* is incompatible with equilibrium theory.

Hicks proposed to incorporate money in the sphere of the theory of value instead of the theory of capital. Under Swedish influence, in particular Myrdal, Hicks (1973, p. 143) substituted the notion of intertemporal equilibrium for his notion of temporary short-run equilibrium (the Hicksian week) with given expectations and constant equipment in his 1935 article on "Wages and Interest" (1935b), *en route* to his "Suggestion to Simplifying Monetary Theory" (1935a). In this temporary sequential equilibrium, expectations are regarded as exogenous, thus the equilibrium in a determined Hicksian week did not imply that individuals' plans are compatible in the future (i.e., it did not imply intertemporal equilibrium with perfect foresight). In this manner, Hicks adapted the Walrasian equilibrium notion to the short period including non-stationary conditions and the existence of money (as a reserve of value).

In response to Myrdal's critique, Hayek gave a lecture on "Price Expectations, Monetary Disturbances and Malinvestments" ([1933] 1939) delivered in December 1933 in the *Sozialökonomisk Samfund* in Copenhagen. The paper was first published in 1935 in German in *Nationalokonomisk Tidsskrift*, reprinted in French also in 1935 but only translated into English and published in his collection of essays *Prices, Interest, and Investment* (1939) in 1939. At the end of his lecture, Hayek ([1933] 1939, p. 155) acknowledged that "I cannot quite agree with Professor Myrdal when he alleges that in my theory there is no room for the role played by expectations - to show how important a place they do play was in fact one of the purposes of this lecture."

It is in his Copenhagen lecture that Hayek first expresses his discontent with the theoretical apparatus of equilibrium analysis to deal with dynamic, expectational, and imperfect foresight situations, problems involved in business cycle theory. In addition, as Nicolai Foss (1995) called attention, it is in this lecture that Hayek first conceptualized the epistemic distinction between individual objective equilibrium and social inter-subjective equilibrium. Moreover, he also articulates for the first time the notion of subjectivity of knowledge and expectations. This would be a crucial building block in Hayek's reformulation of equilibrium analysis in his pivotal essay on "Economics and Knowledge" (1937). As Hayek (1983, p. 425-6) explained in an interview,

> "Yes, it was really the beginning of my looking at things in a new light. If you asked me, I would say that up till that moment I was developing conventional ideas. With the 1937 lecture to the Economic Club in London, my presidential address, which is 'Economics and Knowledge,' I started my own way of thinking. Sometimes in private I say I have made one discovery and two inventions in the social sciences: the discovery is the approach of the utilization of dispersed knowledge, which is the short formula which I use for it; and the two inventions I have made are denationalization of money and my system of democracy. It was several ideas converging on that subject. It was, as we just discussed, my essays on socialism, the use in my trade-cycle theory of the prices as guides to production, the current discussion of anticipation, particularly in the discussion with the Swedes on that subject, to some extent perhaps Knight's *Risk, Uncertainty and Profit*, which contains certain suggestions in that direction -- all that came together. And it was with a feeling of a sudden illumination, sudden enlightenment, that I wrote that lecture in a certain excitement. I was aware that I was putting down things which were fairly well known in a new form, and perhaps it was the most exciting moment in my career when I saw it in print."

The Copenhagen lecture anticipated many of the discussions that Hayek posed in his 1937 critique of the perfect knowledge assumption of standard equilibrium theory. In "Economics and Knowledge," Hayek (1937, p. 33) begins by reminding the reader of different attempts made "to push theoretical investigation beyond the limits of traditional equilibrium analysis," whose "answer has soon proved to turn on one question which, if not identical with mine is at least part of it, namely the question of foresight."

Hayek mentions the discussions concerning foresight in the theory of risk, especially starting with Irving Fisher's *Appreciation and Interest* (1896) and developed in Knight's (1921) profound work. Moreover, such assumptions are of fundamental importance in the "theory of imperfect competition, the questions of duopoly and oligopoly." This was emphasized by Morgenstern's (1935) famous essay claiming that any perfect foresight process was inconsistent with convergence to equilibrium. Morgenstern illustrates his argument, in this case a strategic interaction between two agents, with his Holmes-Moriarty paradox.

Hayek (p. 41) refers to this work in his article. More importantly for our purposes, however, is that "it has become more and more obvious that in the treatment of the more 'dynamic' questions of money and industrial fluctuations the assumptions to be made about foresight and 'anticipations' play an equally central role, and that in particular the concepts which were taken over into these fields from pure equilibrium analysis, like those of an equilibrium rate of interest, could be properly defined only in terms of assumptions concerning foresight. The situation seems here to be that before we can explain why people commit mistakes, we must first explain why they should ever be right" (p. 34).

Hayek reformulates equilibrium analysis in terms of compatibility of action plans conducted by different agents with different subjective, dispersed, and tacit knowledge of the same objective reality. Since individual knowledge is "all facts given to the person in question, the things as they are known to (or believed by) him to exist, and not in any sense objective facts" (p. 36), each individual must take into his own action plan the expectations over the other individuals' plans as an objective fact. In this sense, social equilibrium means that each agent has correctly predicted in a special sense all the action plans carried over by the rest of society and the external reality. Hayek ([1937] 1948, p. 42) concludes, in consequence, that "[c]orrect foresight is then not, as it has sometimes been understood, a precondition which must exist in order that equilibrium may be arrived at. It is rather the defining characteristic of a state of equilibrium."

Hayek mentions his Copenhagen lecture in "Economics and Knowledge," referring to it as a concrete example of the meaning of a state of equilibrium defined as the coordination of plans and how it can be disturbed. The intertemporal coordination problem of savings and investment is, in this sense, "the proportion (in terms of relative cost) in which entrepreneurs provide producers' goods and consumers' goods for a particular date, and the proportion in which consumers in general will at this date distribute their resources between producers' goods and consumers' goods" (p. 42). As he put it ([1933] 1939, pp. 153-4), the consistency between these two sets of independent decisions made by different agents implies the savings-investment equilibrium and "the idea of an equilibrium rate of interest." Assuming a unitary elasticity of expectations, a money rate below the natural rate, Hayek argues, creates unfounded expectations in entrepreneurs concerning the intertemporal consumption behaviors of the society.

Until 1933, the subjective element was not present in Hayek's writings, although the notion of division of knowledge had been incorporated. In his Copenhagen lecture, Hayek ([1933] 1939, p.

139) contrasts individual equilibrium in the realm of the pure logic of choice - something which we can define as "a necessary equilibrium between the decisions which a person will make at a given moment" due to subjective consistency between means and ends - and societal equilibrium, a much more vague notion since individuals' "successive responses to their fellow-beings necessarily take place in time."

In 1933, Kaldor was an active participant in the notable weekly seminar organized by Robbins and Hayek at LSE. It was at the seminar that Kaldor read his paper on "A Classificatory Note on the Determinateness of Equilibrium" (1934a). In this important essay, Kaldor (1934a, p. 125) describes the conditions in which an equilibrium position can be classified as determinate or indeterminate ("according as the final position is independent of the route followed or not"), unique or multiple ("according as there is one, or more than one, system of equilibrium prices, corresponding to a given set of data"), and definite or indefinite ("according as the actual situation tends to approximate a position of equilibrium or not"). Kaldor was searching for a more rigorous definition of the assumptions utilized in which was possible to determine the existence, stability, and uniqueness of the equilibrium position from a system of data (independent variables).

Kaldor (p. 123) makes six general assumptions under which economic theorists had found it necessary to define an equilibrium position taking into consideration the time dimension. (i) A closed economy (either an isolated individual or a closed self-sufficient community); (ii) perfect knowledge, i.e. "all the relevant prices quoted in all markets are known to all individuals;" (iii) perfect competition, i.e. "no individual can influence any of the prices which he is confronted;" (iv) direct exchange, with all prices expressed in one good working as the *numéraire*; (v) all independent variables remain constant through time; (vi) no price-changes are anticipated, i.e. the Hicksian elasticity of expectations is unitary.

In relation to the time-dimension assumptions (v) and (vi), Kaldor (p. 123) notes that "[t]he only alternative assumption consistent with the degree of abstractness necessary for the generalisations of pure theory would be the assumption of *complete foresight*: that everybody foresees correctly the future course of prices." Thus, referring to Hicks' 1933 essay on "Equilibrium and the Trade Cycle," Kaldor argues that the complete foresight assumption could be more conveniently adopted as dynamic analysis.

According to Kaldor (1934, pp. 124-5), in the case of determinateness, to secure equilibrium it is necessary that "(1) an equilibrium system of prices *will* be established immediately, or (2) the set of prices actually established leaves the conditions of equilibrium unaffected (in which case the final position will be independent of the route followed)." Similar to Hayek (1937), Kaldor distinguishes requirements for equilibrium in the case of the isolated individual and a closed community. In the first, Robinson Crusoe must possess "full experience" or full knowledge of his tastes, preferences, and the external world. The word experience is used here merely to relate to Crusoe's knowledge. "It excludes any accumulation of knowledge which represents a change in the technical terms at which he can obtain various things."

In a community, the necessary conditions for equilibrium are more rigorous. We must assume not only that all individuals have full knowledge regarding their own tastes, abilities, and external experience, but that "*all* exchange transactions are undertaken at the same system of prices." Kaldor mentions the *Deus ex machina* devices such as Walras's *tâtonnement* (excluding *ex hypothesis* trading at false, non-equilibrium prices) and Francis Y. Edgeworth's "principle of re-contract" - where provisional contracts operate until no re-contracts can be made with advantage to the re-contracting parties. Both analytical methods are devices to discover the true equilibrium prices *before* individuals undertake their exchanges. In this sense, equilibrium will always be determinate if it is immediately reached. Thus, Kaldor (p. 127) concludes that one central problem in equilibrium theory is that "[t]he formation of prices must *precede* the process of exchange and not be the result of it."

Kaldor then discusses the implications of the independence of the equilibrium position and the actual path followed to this position for equilibrium to be determinate. At the individual level, Crusoe's system of data in one period must not be affected by his actions in previous periods. It must be assumed, therefore, that there is no - or constant - carry-over and that his effective preferences are unaffected between periods. In contrast, Kaldor (p. 128) argues that the effects of learning and experience through time are the elements "which the 'causal-genetic-approach' of the Austrian School ha[ve] been mainly concerned." This approach was defined by Hans Mayer (1932) in which he contrasted the Austrian approach with the Lausanne general equilibrium functional analysis. Mayer (1932) was also referred to in Hayek's 1937 article.

Kaldor summarizes the causal-genetic notion writing that its aim is "to show how, in a given situation, a position of equilibrium is reached - the problem of how prices come into being rather

than what system of prices will secure equilibrium. It is, however, only under our present very rigid assumptions that a causal-genetic theory can reach the same conclusions concerning the nature of equilibrium as are evolved, by using a different method, by the 'functional' theories. In the absence of these conditions it is only by means of a 'theory of the path' (a theory showing what determines the actual path followed) that a causal-genetic approach can arrive at generalisations concerning the nature of equilibrium - and such a theory has not hitherto been forthcoming, although the necessity for it has frequently been emphasised by writers of the Austrian School." Indeed, Hayek's equilibrium as a coordination problem is devoted to the expression and reformulation of this problem.

It is curious to note that, discussing the additional assumption of constant marginal utility of money introduced by Marshall in the case of a community case, Kaldor writes that "[i]f we assume that individuals accumulate experience relating not only to their own system of data but also to the 'tastes and obstacles' of others, they will gradually acquire an ability to judge the 'equilibrium prices' of a given market." Nevertheless, Kaldor is anxious to write that it can be argued "that this alternative assumption - that individuals will be able to judge equilibrium prices before any transactions are made - is inconsistent with one of our initial assumptions since it means that they are influenced by expected future prices rather than by prices already ruling. It all depends on how rigidly this assumption is interpreted, and it can easily be shown that under our present assumption of a 'constant carry-over' a *very rigid* interpretation would lead, by a different route, to the same result." A constant carry-over can be translated in the consistency of *ex ante* expectations and *ex post* results, i.e. correct foresight.

In the case of definiteness, not only may equilibrium be "indeterminate" but "if the various forces do not react instantaneously on the incentive of price changes, the economic system need not tend towards a position of equilibrium at all. The successive alterations of prices will then merely represent a constant or an expanding range of fluctuations" (p. 125). In Kaldor's view, the question whether equilibrium is definite or indefinite (i.e., is stable or not) depends on the velocities of adjustment of the factors in the analysis, i.e., the time required for a full quantity adjustment given a price change. For instance, consider an adjustment completely discontinuous where the full quantity adjustment occurs only after a certain period. In this scenario, the equilibrium stability (its definiteness) will depend on the relative elasticities of demand and supply.

It is here that Kaldor (1934a, pp. 133-4) pronounces the novel description of the famous ideas advanced by Henry Schultz and Umberto Ricci, coining for the first time the expression "cobweb theorem," regarding the temporal lag between supply and demand sequential decisions to explain the oscillatory behavior of prices. He concludes that, in this case, "[i]f the velocities of adjustment are greater on the demand side than on the supply side, movements will lead towards an equilibrium, i.e. equilibrium will be 'definite'" (p. 135). Kaldor gives two agricultural examples, rubber and corn, since in agricultural contexts there is a lag between planting and harvesting.

In the case of multiple equilibria, Kaldor (pp. 131-2) analyzes the intrinsic connection between stages of increasing returns to single industries (i.e., stages of diminishing technical marginal substitution rates) and the indetermination of equilibrium. In these cases, "the final situation will be 'indeterminate' in the sense that it will depend upon the direction which happens to be adopted initially; though equilibrium may still be determinate on our definition of the term, since all the possible equilibrium positions may still be deduced from the data of the initial situation." Of course, the argument reflects the notion of path dependence in which each action pre-determines the possible realms in the future. We should note the intimate relation of Young's (1928) influential paper on increasing returns here, an idea that will be very dear to Kaldor.

## VI. THE AGE OF CAPITAL

*The Age of Capital: 1848-75* ([1975] 2001) is the title of the second book of the trilogy on "the long nineteenth-century" by the well-known Marxist historian Eric Hobsbawm. A similar age could be periodized in relation to the age of the theory of capital in "the long twentieth-century" in economics, dating from the marginal revolution in 1871. We could argue that this age should be dated from 1871 to 1941, the year that Hayek finally published his *The Pure Theory of Capital* (1941).

In the 1935-6 academic year, Kaldor traveled to the United States on a Rockefeller Research Fellowship, visiting Columbia, Harvard, Chicago, and the University of California. He met numerous leading economists, attending the 1935 and 1936 meetings of the Econometric Society. As a product of his fellowship, Kaldor was commissioned to write the 1937 Annual Survey of Economic Theory, published in the Society's *Econometrica*. In the survey, "The Recent

Controversy on the Theory of Capital" (1937), Kaldor reviewed Frank Knight's (1932, 1936a, 1936b) criticism of the "traditional theory" of capital, i.e., that a given index or measurement of capital intensity is positively correlated with roundaboutness of production and inversely correlated with interest rates. This "traditional theory" is nothing more than the Wicksellian neoclassical synthesis of the Austrian theory of capital. In Kaldor's (1937a, p. 231-2) view, "the material content of the Austrian theory of capital could be equally well expressed by saying that capital accumulation leads to a reduction in the marginal productivity of the services of those factors whose quantity can be augmented by [...] accumulation, as by saying that it increases the investment period of the services of those resources whose quantity remains constant."

With his survey, Kaldor entered into the theory of capital controversy that involved Hayek and Knight in the years before (e.g., see Cohen, 2003; Boettke and Vaughn, 1998). Kaldor adopted the Austrian tradition in the sense that a theory of capital should be characterized by the time dimension of the production period, contrary to Knight's view of a perpetual fund of goods. Knight was following John Bates Clark's concept of capital as a homogeneous social value-form, an abstract always existing fund (like land) called jelly. Nevertheless, Kaldor (1937a, p. 213) dropped the average period of production (or investment period) as an index of capital intensity in favor of his favorite alternative, the ratio of initial costs to annual (maintenance) costs.

In their controversy, both Kaldor (1938a) and Knight (1938) agreed on the intrinsic problems that arise in general models with heterogeneous inputs and/or outputs so that the results of the simple one homogeneous commodity model - namely, a decreasing monotonic function between capital intensity measured by an index of capital quantity and the interest rate - could not be sustained. Indeed, the existence of a well-behaved index measure for capital quantity in an economy in steady-state equilibrium would be revived in the Cambridge controversy on capital in the 1950s and 1960s (e.g., see Cohen and Harcout, 2003).

The central problem posed by the Cambridge capital controversy is the circularity of the equilibrium notion involved. The *quantum* of capital is determined by the marginal productivity principle and, at the same time, the marginal productivity of capital is determined by the *quantum* of capital. In 1936, Knight (1936a, pp. 434-5) expressed the problem arguing that the

> "[d]ifficulty and complexity arise because the relation between capital and interest take different forms and especially because of the danger of circular reasoning. On the one hand, capital is

> usually and properly defined as 'income' capitalized at some 'rate of return'. But the interest rate is usually thought of as the ratio between the net annual yield and a quantity of capital. On the face of this is a vicious circle; interest cannot be a rate of return; i.e. a ratio to a principal, unless the terms of the ratio are definable independently of the rate return itself; yet in the same units of both numerator and denominator."

Hayek (1941, p. 143) was also conscious of these problems but argued that as a process dynamic story, as a causal-genetic notion, the average period of production and the Austrian theory of capital were relevant. In his words, "[i]n order to arrive at an aggregate figure of the amount of waiting involved in each process we have to assign different weights to the different units of input, and these weights must necessarily be expressed in terms of value. But the relative values of the different kinds of input will inevitably depend on the rate of interest, so that such an aggregate cannot be regarded as something that is independent of, or as a datum determining the rate of interest." As Hayek (1994, p. 96) wrote later in life, "I rather hoped that what I'd done in capital theory would be continued by others. [...] [Completing it myself] would have meant working for a result which I already knew, but I had to prove."[14]

In his controversy with Keynes, Hayek criticized Keynes' failure in ignoring the Wicksellian roots in capital theory. Hayek soon sensed that the main difference between him and Keynes was grounded in the capital theoretical micro-foundations. Hayek was heavily criticized by Sraffa, Myrdal, and others for incorporating in his business cycle theory the Austrian theory of capital in the simple Böhm-Bawerkian model with the average period of production. In Hayek's (1983, p. 46) view, "an elaboration of the still inadequately developed theory of capital was a prerequisite for a thorough disposal of Keynes' argument." Therefore, he went up on a big book project in which he planned a new development on capital theory drawing from and systematizing the roots of Böhm-Bawerk, Wicksell, and Mises in volume I. Volume II was planned to introduce these new capital theoretical foundations into monetary theory and business cycle.

In the writing process, Hayek (1941, p. vi) perceived that the very simplifications that his predecessors made had "such far-reaching consequences as to make their conceptual tools almost useless in the analysis of more complicated situations." The main deficiency, in his view, was the attempt to introduce the temporal dimension in the capital structure, which resumed in the

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[14] Ian Steedman (1994) discusses in more detail Hayek's *The Pure Theory of Capital* (1941) against the background of the Cambridge capital reswitching controversy.

average period of production. The task showed itself much more painfully difficult than initially foreseen and Hayek did not complete his initial project, only publishing a part of what would be the first part in *The Pure Theory of Capital*. In the end, Hayek also abandoned the notion of the average period of production in 1941. As Hayek (1994, pp. 90-1) recollects,

> "I had been criticized for the fact that in *Prices and Production* I had a very inadequate theory of capital; that in this crude Böhm-Bawerkian form of an average period of production, it was inadequate. So I had started a great book on capital and money, which ultimately dealt with the money phenomenon. It took me very much longer than I thought, I worked seven years on the thing. I was dead tired of the subject before I got to the monetary aspects. And then war came, which finally persuaded me to put that part into a separate volume and leave for the time being the monetary part altogether, which I was intending to do another time."

In *The Pure Theory of Capital* (1941, pp. 23-4), Hayek adopts his reformulation of equilibrium analysis in terms of compatibility of plans. The equilibrium is understood as "a state of complete compatibility of *ex ante* plans," where in consequence "the *ex post* situation is identical with the *ex ante*." He states, mentioning Myrdal's *Monetary Equilibrium* (1939, p. 46), that this causal analysis "is not fundamentally different from the comparison between the prospective and retrospective (or *ex ante* and *ex post*) views ·of a particular situation, as used by the younger Swedish economists since the *ex post* situation can be derived from the *ex ante* only by reference to the degree of correspondence or non-correspondence between individual intentions."

In the Kaldor and Knight controversy, as Avi Cohen (2006, p. 156) documented, the debate focused "on three questions: Is capital a distinct factor of production? Is capital quantifiable in a theoretically consistent manner? Do we need process stories around convergence to, or changes in, equilibrium interest rates? To all questions, Kaldor essentially answers 'yes' to Knight's 'no.'" Kaldor assumed (again) a middle-ground position between Knight and Hayek, but he essentially defended the Austrian capital theory as the only theory known capable of systematizing the causal-genetic relationships and the process dynamic story between the quantity of capital and interest rates. As a positive theory of capital, the Austrian theory was "the only one yet produced."

In the Kaldor and Knight controversy, the long historical points in dispute in the capital theory wars since the controversy between Clark and Böhm-Bawerk in the early twentieth century moved from the adequacy of periods of production to the production function form; and from roundaboutness as a proper index to capital intensity to diminishing returns. This controversy was pivotal to Kaldor's conversion concerning the theoretical shortcomings of a pure theory of capital and its interrelations with equilibrium. As Kaldor (1937b) wrote to Knight,

> "[T]he Austrian theory was a grand attempt at a 'positive' theory of capital, in fact the only one yet produced. It failed, and the theory must be rejected, for it could not survive the criticisms leveled upon it [...]. On the other hand, I do believe that the disappearance of Böhm-Bawerk and his school leaves behind a vacuum in economic theory as we know it and I doubt if it will be filled. To me its failure points to the necessity for the abandonment of the whole system of analysis (of the static equilibrium type) of which the Austrian theory was a part."

## VII. GROWTH, CAPITAL ACCUMULATION, AND DISTRIBUTION

In 1938, Kaldor published "Stability and Full Employment" (1938b) on the question of stability of full employment vis-à-vis the non-variability of the structure of production. He emphasized the crucial aspects of complementarity and specificity of capital goods that composed the structure of the means of production. Indeed, this was precisely the point that Hayek had argued in relation to industrial fluctuations but in terms of the stages of production and capital organicity. As it is well known, in a Leontief production function (which exhibits perfect production factors complementarity) the transition, or the traverse to, different equilibrium states are far from unproblematic and could threaten the possibility of a full employment long-run stability position.

This is precisely the case worked in Harrod's (1939) dynamic instability analysis and posed by the second Harrodian (equilibrium instability) problem. Assuming a complementary production structure, that can be expressed in a Leontief production function, Harrod showed that given the capital-output ratio to be constant there is a unique warranted capital accumulation rate that guarantees the equality between aggregate demand and aggregate supply along the equilibrium

dynamic path. However, to secure the full employment position over time with increasing population and technical progress, the warranted growth rate ($g_w$) has to be equal to the natural rate of growth ($g_n$) defined as the rate of growth in which output is constrained at full employment given the population and technological growth rate. Thus, the balanced growth rate with full employment of the labor force and technological progress must satisfy the following condition, $g_w = g_n = \frac{s}{v}$ (1), where $s$ is the marginal propensity to save and $v$ is the capital-output ratio.

However, although possible, there is no economic adjustment mechanism that guarantees that the parameters in the equilibrium condition described in equation (1) will take the necessary values to match the warranted and natural growth rates. Indeed, as the variables $s,\ v,$ and $g_n$ are determined by different exogenous factors, it is highly improbable that the equilibrium conditions will ever be attended to. Moreover, even if a full employment situation is achieved, this position is unstable since any shock or change in the parameters will launch the economy on a dynamic instability path through time. Harrod conjectured an inherent instability of $g_w$, so even if $g_n < g_w$ full employment will be achieved but it could not be sustained for a long time. In fact, in this case, if $g_w$ is stable, the economy would be in an explosive growth trajectory.[15] The reconciliation of the warranted rate of capital accumulation with the natural rate of growth became the basic dynamic economic problem.

There are only two ways to restore the stability of the equilibrium dynamic path. First, the capital-output ratio (the capital intensity) can be the adjustment variable between differences in the warranted and natural growth rates. This solution was exactly the kind of approach that the Austrian theory of capital predicted and that Hayek had worked on in his business cycle theory. In this theory, divergences between the natural and monetary interest rates distort the intertemporal equilibrium between the capital-output ratios defined as the length of production of the average production period, thus the traverse to the new equilibrium would be aborted because of the capital structure maladjustments due to the new required forced savings. Indeed, it was the endogenization of the capital-output ratio via a Cobb-Douglas production function - with the

[15] The contrary is true if gn > gw. In this case, there would be technological unemployment and the economy would be on an explosive trajectory to depression and secular stagnation.

elasticity of substitution equal to one and diminishing returns - the grand neoclassical solution made by the Solow-Swan model to the Harrodian instability dilemma.

Nevertheless, Kaldor used the same argument of complementarity and specificity of capital goods in the structure of production to state that for these same reasons the capital intensity as measured by the capital-output relation is *inelastic* as a medium and long-run adjustment mechanism between $g_w$ and $g_n$. Anthony Thirlwall (1991, p. 24) writes that "[t]he paper that gave Kaldor the most intellectual satisfaction, however, and his most notable, but neglected, contribution to the immediate Keynesian revolution, was 'Speculation and Economic Stability' (including "Keynes's Theory of the Own-Rates of Interest" originally written as an appendix, but published much later)."[16] In a private correspondence with Kaldor, Hicks described this article as the "culmination of the Keynesian revolution in theory. You ought to have had more honour for it" (quoted in Targetti and Thirlwall, 1989, p. 4).

In "Speculation and Economic Stability" (1939b), Kaldor argued that the elasticity of demand for holding stocks is distinct from the elasticities of flows of the ultimate buyers and sellers. Due to speculation forces, prices are stabilized; and the greater the stability of prices, the greater the instability of quantities. According to Kaldor, the most important asset in an economy that speculation forces tend to stabilize is the long term bonds market canalized by savings. With the long term bonds' prices stabilized, the adjustment mechanism between savings and investment must be variations in income, securing the conditions for the validity of the income multiplier and Keynes' principle of effective demand. Thus, Keynes' multiplier theory is a result of the stabilizing influences of speculative expectations in stocks.[17] As Kaldor (1980, p. xvii) writes, his intention in the paper was

> "to generalise Keynes' theory of the multiplier by demonstrating that it results from the stabilising influence of speculative expectations on prices which applies in all cases in which

[16] Ursula Hicks, John Hicks' wife and the editor of *Review of Economic Studies*, cut off the sixteen page appendix of the published version since it was already long. Kaldor's revised article on Keynes' theory of interest was only published in 1960 in his *Essays on Economic Stability and Growth* (1960).

[17] Kaldor applies this reasoning to Keynes' theory of interest delineated in chapter 17 of *The General Theory* (1936). The term structure of interest rates is composed of a conventional rate of return on money plus a risk premium for different asset maturities. Moreover, money is the asset that sets the investment limit, thus income and employment. Keynes ([1936] 1971, pp. 223-4) claims that the rate that will prevail in the market will necessarily be "the greatest of the own-rates of interest," i.e., the marginal rate which bound the other rates. Money is always the greatest of the own-rates of interest because of its essential liquidity property (i.e., low carrying cost and high liquidity premium), it cannot be negative while all the other own-rates can.

> the elasticity of speculative stocks is high ... [and] to show that Keynes' theory of interest contains two separate propositions. The first regards interest as the price to be paid for parting with liquidity, and it arises on account of the *uncertainty* of the future prices of non-liquid assets. The second concerns the dependence of the current rate of interest on the interest rates expected in the future. While the first proposition provides an explanation of why long-dated bonds should normally command a higher yield than short-term paper, it is the second which explains why the traditional theory of the working of the capital market was inappropriate – why, in other words savings and investment are brought into equality by movements in the level of incomes, far more than by movements in interest rates. And this second effect will be the more powerful the *less* is the uncertainty concerning the future, or the greater the firmness with which the idea of 'a normal price' is embedded in the minds of professional speculators and dealers."

In 1939, in addition, Kaldor attempted a theoretical and empirical critique of Hayek's business theory in "Capital Intensity and the Trade Cycle" (1939a), continued in his controversy with Hayek over the so-called Ricardo and Concertina effects in the pages of *Economica* in 1942 (Kaldor, 1940b, 1942; Hayek, 1942). Kaldor (1939a) addresses what determines the optimum degree of capital intensity and its relation with the trade cycle.

In 1937, Kaldor argued that the investment period is only one way of measuring the capital/output ratio. Adopting an ordinal measure, he favored an index of the ratio of the initial cost to annual cost in output production. Therefore, what he called *actual* capital intensity is defined by the selling prices and costs ratio. In this sense, actual capital intensity must fall in the boom and rise in the bust period, since in the short run capital stock is fixed and only labor can be incorporated into the production. In its turn, *normal* capital intensity increases by more durable equipment and capital goods (which require a lower amortization per unit of output) and more automatic capital goods (which require less labor per unit of output).

Kaldor (1939a) maintains that probably the normal capital intensity varies inversely with the trade cycle because real wages fall and the interest rate rises in the boom period, the exact opposite result of the Austrian business cycle theory. Moreover, the optimum capital intensity of *new* investments is determined by the technique which maximizes the area between the Keynesian marginal efficiency

of the capital curve and the supply curve of investible funds.[18] In 1940, in his "A Model of the Trade Cycle" (1940a), Kaldor utilized non-linear investment and savings functions to produce limits to the trade cycles.

In 1947, Hayek refused Kaldor's request for leave of absence, thus Kaldor resigned from LSE to become Director of Research and Planning at the recently founded United Nations Economic Commission for Europe (UNECE) in Geneva.[19] Kaldor was invited by Myrdal, the first Executive Secretary of the Commission. During his time at the Economic Commission for Europe, Kaldor developed with Myrdal the notion of circular cumulative causation (a concept that Myrdal appropriated from Wicksell and that encounters echoes and parallels in Thorstein Veblen's idea on cumulative causation). While Kaldor applied this notion mainly to the demand-supply relationships in the manufacturing sector, Myrdal concentrated on the political economy and social provisioning aspects of underdeveloped regions, arguing that there is no tendency for automatic self-stabilization in the social system. In the same manner, there is no such tendency in the economic system.

Kaldor's use of cumulative causation is closely related to the empirical positive linear long-run relationship between productivity growth and output growth, known as Verdoorn's law. In 1949, drawing from statistics of industrial production, the Dutch economist Petrus J. Verdoorn (1949) argued that output growth increases productivity growth due to increasing returns in an approximate estimated rate of the square root of the output (a Verdoorn coefficient close to 0.5). Verdoorn's article was written while he was a staff member of the Research and Planning division of the UNECE under Kaldor's direction. In his 1966 Cambridge inaugural chair lecture on the "Causes of the Slow Rate of Economic Growth in the United Kingdom" (1966), Kaldor regressed the rate of growth of labor productivity on the rate of growth of manufacturing output using data from several

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[18] The issues involved in the Kaldor and Hayek debate on capital intensity, trade cycle, and the Concertina and Ricardo effects deserve a far more detailed discussion and analysis (see, e.g., Moss and Vaughn, 1986; Thirlwall, 1987, pp. 40-7; Desai, 1991).

[19] According to Thomas (1991, p. 390), "[t]he ruling powers were passionate believers in freedom, and this included freedom to adjust the constraints within which freedom was exercised by the nonfavorites ["those who rejected the Hayek-Robbins line"]. The main type of adjustment was the postponement of tenure. In my own case I did not receive tenure until, on the advice of Sir Alexander Carr-Saunders, I moved from monetary theory to migration and economic growth." Hayek (1983, p. 370) recollects that one of the few things that he and Robbins disagreed on was who to give the tenure professorship promotion at LSE. Hayek favored Abba Lerner instead of Kaldor, while Robbins favored Kaldor. "Hayek: No, I don't think it would benefit to make it public now. I was going to say simply this: in the end, we had the problem that both Kaldor and Lerner were clearly such exotic figures that we couldn't keep them both in the department. And one of very few points on which Robbins and I ever disagreed was which of the two to retain. [laughter] Alchian: I'd heard that there was a dispute. My impression or recollection — you needn't correct it or say it's right or wrong -- was that you favored Lerner and he favored Kaldor. Hayek: Yes, that's correct."

industrialized countries from 1953-4 to 1963-4. Using a modified version of Verdoorn's law, he explained Britain's poor economic performance - sustaining the strong relationship particularly in manufacturing, public utilities, and construction.

Kaldor argued that the potential productivity growth is limited by the supply of labor which allows the exploration of static and dynamic (on capital accumulation and technical progress) increasing returns. This became known as Kaldor's second growth law, or Kaldor-Verdoorn law, which establishes a positive deterministic relation between the growth of manufacturing productivity and the growth of manufacturing output (see Thirlwall, 1983).[20] The Kaldor-Verdoorn law became a crucial foundation for the cumulative causal model of economic growth, which places in demand instead of supply (e.g., *à la* Solow-Swan) the drive for growth.

In October 1949, Kaldor would return to academic life at Cambridge University, resuming the offer made after Keynes' death by the Provost of King's College in 1947. In the meantime, his interests moved from the trade cycle to economic growth, stimulated by Harrod's research. The inter-relationship between the rate of capital accumulation and the rate of growth of labor productivity led Kaldor (1986, p. 17) to think about the intrinsic connection between technical progress and capital goods investment in the sense that "inventions require to be embodied in 'machines' or equipment of some kind." This means that "it is impossible therefore to isolate the effects of capital accumulation and the effects of 'technical progress' on the productivity of labor." In other words, it is impossible to isolate movements along the production function from shifts of the same function.

Kaldor then used a technical progress function, relating the rate of productivity growth and the rate of new investment per worker, completely rejecting the notion of a production function and the technological frontier of substitution between labor and capital, thus the marginal productivity theory of distribution (between wages and profits). Reflecting on Keynes' widow's cruse parable in the *Treatise on Money*, Kaldor (p. 19) concluded that to aggregate business

[20] Verdoorn's 1949 article was first published in Italian and, although mentioned in some important works in the 1950s and 1960s, did not attract much attention until Kaldor's 1966 inaugural lecture. The paper was only translated into English by Thirlwall in 1993 and published in the second volume of *Italian Economic Papers* (1993), organized by Luigi Pasinetti. The Swedish economist Ingvar Svennilson, in fact, was the first to find the empirical regularity in a 1944 Swedish essay on the occasion of Eli Heckscher's *Festschrift*. Svennilson (1944) stressed the interrelation between technical change, production growth, and productivity increases in industrial labor in Sweden, discussing old and new technology distribution in a sector with particular reference to the lags of new technology application (which is longer the slower production growth is). Svennilson (1950, 1954) was also recruited by Myrdal to work at the UNECE, being the first to mention Verdoorn's 1949 article. For a discussion on Svennilson and the Kaldor-Verdoorn law, see Boianovsky (2012).

profits to be positive (an essential fact in a market economy) the outlays of business must largely exceed personal savings and that the "savings out of profits must be large relative both to the total capital outlay and to the total profit." These two basic inequalities resulted in his Keynesian theory of distribution, namely, (2) $s_p > s_w \geq 0$ and (3) $s_p > \frac{I}{Y} > s_w$.

Kaldor relied on the endogeneity of the marginal propensity to save as a function of the income distribution (between wages and profits) as the solution for the Harrodian instability dilemma. This endogenization is an outgrowth of Kaldor's perhaps major original contribution, his Keynesian theory of income distribution delineated in the final pages of his "Alternative Theories of Distribution" (1956). Kaldor incorporates Keynes' savings propensities into a framework of income distribution *à la* Ricardo. However, using Keynes' principle of effective demand Kaldor reversed Ricardo's causal chains, which take wages as an exogenous magnitude determined by workers' subsistence and profits as residual, by taking profits as exogenous (at a level determined by full employment investments) and wages as a residual. This reversed the causality chain of the classical Ricardian and neoclassical marginal productivity distribution theory.

In the 1950s and 1960s, Kaldor combined the technical progress function, the Keynesian savings function, and an investment function *à la* Keynes-Harrod to build his three different versions of a model of economic growth and distribution (Kaldor, 1957, 1961; Kaldor and Mirrlees, 1962), the first with the help of David Champernowne and the last co-authored with James Mirrlees. Kaldor (1986, p. 19) was able to demonstrate that "it is possible to construct a model which has a determinate solution in terms of growth rates, the capital/output ratio, the investment coefficient, the profit share and the profit-rate without involving a 'production function' or indeed marginal analysis of any kind."

The different savings propensities solution proposed by Kaldor (and later Pasinetti) was the building block of the post-Keynesian growth and income distribution models. In this class of models, the aggregate marginal propensity to save is variable because different income recipients such as wage earners or profit recipients (Kaldor) or different social classes (Pasinetti) have different marginal propensities to save. In this manner, changes in the wages or profits participation in total income can change the total propensity to save - since the aggregate propensity to save is nothing more than a ponderate average weight of the marginal propensities to save of different income components. Therefore, there is a determined income distribution

between wages and profits which will generate precisely a corresponding amount of profit share in national income compatible with full employment pre-determined investments.

## VII. EPILOGUE

Kaldor's solution to Harrod's instability dilemma is the forced savings scenario described by Sraffa's critique of Hayek's theory. It is interesting to note that the capital theory wars (between Knight, Hayek, and Kaldor) and especially Keynes' *General Theory* killed the Austrian theory of (heterogeneous) capital in favor of Bates Clark's aggregate production function with malleable capital jelly and diminishing returns.

Paradoxically, in the Cambridge capital controversy in the 1950s and 1960s, Kaldor and others would deny the existence of a well-behaved inverse relationship between capital accumulation and interest rates in the production function form in growth models, emphasizing capital heterogeneity and capital and labor non-substitutability. However, Kaldor himself abandoned all the capital theoretical issues involved in heterogeneous capital adopting the one good model with flow equilibrium in his models. As Desai (1991, p. 55) wrote, Hayek's "challenge of integrating money and heterogeneous capital in a dynamic cyclical growth model still remains. Kaldor was one of the few if not the only modern economist who knew all the pieces of the jigsaw puzzle."

In the early 1930s, Kaldor was a Hayekian economist working within the Austrian theory of capital and business cycle. In their 1931 controversy, Hayek had criticized Keynes' *Treatise* for adopting Wicksell's ideas but not his Austrian theory of capital. However, Sraffa's (1932a) critique of the Wicksellian natural interest rate and the traverse to a new equilibrium in a forced savings scenario, Myrdal's ([1932] 1933) critique of Wicksell's three conditions to monetary equilibrium, and Knight's (1935) reaffirmation of Clark's theory of capital, exposed not only the frailties of the Austrian business cycle theory, but exposed the limitations of the Austrian theory of capital.

The Austrian theory of capital was the epitome of the neoclassical generalizing marginal productivity theory, as exposed by Wicksteed and Wicksell. Its limitations revealed in essence the shortcomings of the theoretical apparatus of equilibrium analysis in dynamic contexts, inherent in the theory of capital and business cycle theory. This state of affairs led to Kaldor's theoretical emancipation in 1934 and later to an early conversion to Keynes' new ideas, already

in circulation. It also led Hayek to his pivotal 1937 essay on "Economics and Knowledge" where he first stated the fundamental problem of social sciences, the problem of knowledge - a problem that will completely shape his entire intellectual development. These controversies also influenced Kaldor's later dissent developments in the trade cycle theory, the post-Keynesian models of growth and distribution, the Cambridge controversy on capital, and his critical views of neoclassical equilibrium economics.

In the 1970s and 1980s, Kaldor attacked what he called "The Irrelevance of Equilibrium Economics" (1972), claiming that neoclassical equilibrium economics is not a science in the strict sense of the word since the many empirical observations contradicting its assumptions and theoretical hypotheses (e.g., that most firms operate in imperfect markets) are just ignored. Indeed, Kaldor (1986, p. 5) argues that the *a priori* approach of general equilibrium theory meant that "its followers should be pre-occupied with the properties of the notion of 'equilibrium,'" resulting in the acceptance that scientific progress "took the form not of removing the scaffolding [of the simplifying and unreal postulates] but of constantly *adding* to it." In his Arthur M. Okun Lectures delivered in October 1983 at Yale University, Kaldor rather favored an *Economics Without Equilibrium* (1983).

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# Pursuing a Grand Theory: Douglass C. North and the Early Making of a New Institutional Social Science (1950-1981)

ABSTRACT. The paper provides a detailed historical account of Douglass C. North's early intellectual contributions and analytical developments in pursuing a Grand Theory for why some countries are rich and others poor. The systematic, continuous, and profound attempt to answer the Smithian social coordination problem shaped North's journey from being a young serious Marxist to becoming one of the founders of New Institutional Economics. In the process, he was converted in the early 1950s into a rigid neoclassical economist, being one of the leaders in promoting New Economic History. The success of the cliometric revolution exposed the frailties of the movement itself, namely, the limitations of neoclassical economic theory to explain economic growth and social change. Incorporating transaction costs, the institutional framework in which property rights and contracts are measured, defined, and enforced assumes a prominent role in explaining economic performance. In the early 1970s, North adopted a naive theory of institutions and property rights still grounded in neoclassical assumptions. Institutional and organizational analysis is modeled as a social maximizing efficient equilibrium outcome. However, the increasing tension between the neoclassical theoretical apparatus and its failure to account for contrasting political and institutional structures, diverging economic paths, and social change propelled the modification of its assumptions and progressive conceptual innovation. In the later 1970s and early 1980s, North abandoned the efficiency view and gradually became more critical of the objective rationality postulate. In this intellectual movement, North's *avant-garde* research program contributed significantly to the creation of New Institutional Economics.

Key-words. Douglass C. North, Grand Theory, New Economic History, transaction cost, New Institutional Economics.

RESUMO. O artigo contempla uma narrativa histórica detalhada das fases iniciais das contribuições intelectuais e desenvolvimentos analíticos de Douglass C. North em sua busca por uma Grande Teoria para o porquê alguns países são ricos e outros pobres. O esforço sistemático, contínuo e profundo em responder o problema Smithiano de coordenação social moldou a jornada de North de um jovem e sério Marxista para se tornar um dos fundadores da Nova Economia Institucional. Neste processo, North se converteu no início dos anos 1950 em um rígido economista neoclássico, sendo um dos líderes na promoção da Nova História Econômica. O sucesso da revolução cliométrica expôs as fragilidades do movimento em si, nominalmente, as limitações da teoria econômica neoclássica em explicar crescimento econômico e mudança social. Incorporando custos de transação, a estrutura institucional no qual direitos de propriedade e contratos são mensurados, definidos e aplicados assume um papel proeminente em explicar a performance econômica. No começo dos anos 1970, North adotou uma teoria inocente das instituições e direitos de propriedade ainda baseada em postulados neoclássicos. A análise institucional e organizacional é modelada como resultado de um equilíbrio de maximização social. Entretanto, a tensão crescente entre o aparato teórico neoclássico e a sua falha em explicar estruturas institucionais e políticas contrastantes, padrões econômicos divergentes e mudança social contribuíram para a modificação de suas hipóteses e progressiva inovação conceitual. No final dos anos 1970 e começo dos anos 1980, North abandona a visão ingênua de eficiência e gradualmente se torna cada vez mais crítico do postulado de racionalidade objetiva. Nesse movimento, o programa de pesquisa pioneiro de North contribuiu significativamente para a criação da Nova Economia Institucional.

Palavras-chave. Douglass C. North, Grande Teoria, Nova História Econômica, custo de transação, Nova Economia Institucional.

JEL. B31, N00, O43.

# I. PROLOGUE: A GRAND THEORY IN ECONOMIC HISTORY

Unquestionably, Douglass C. North (1920-2015) was one of the most influential economists of the twentieth century. For more than six decades, North dedicated his extensive research program to unveiling the old fundamental question stated 250 years ago by Adam Smith in *An Inquiry into the Nature and Causes of the Wealth of Nations* (1776). "I knew," North (1997a, p. 251) recollects, "where I was going from the day I decided to become an economist. [...] The search for the Holy Grail of the ultimate source of economic performance has taken me on a long and certainly unanticipated journey from Marxism to cognitive science, but it has been this persistent objective that has directed and shaped my scholarly career." Indeed, North's intellectual unfolding is characterized by pursuing a Grand Theory as a response to the Smithian grand social coordination problem. Why are some nations rich and others poor?

In the introductory essay to *The Return of Grand Theory in the Human Sciences*, the intellectual historian Quentin Skinner (1990, p. 3) defines a Grand Theory as "the construction of abstract and normative theories of human nature and conduct." This definition is based on the famous and celebrated book *The Sociological Imagination* (1959) by the American sociologist Charles Wright Mills. In his work, Mills (1959, p. 6) argued for the integration of the domains of the individual and social sphere through "the vivid awareness of the relationship between personal experience and the wider society," a viewpoint that gives the title of his book. Mills (1959, pp. 22-3) contrasted this approach to three widespread theoretical traditions that lack sociological imagination and harm the progress of social sciences.

The first is the exercise of interpreting recorded human history in order to construct some form of teleological philosophy of history, "a trans-historical strait-jacket" in the lines of G. W. Friedrich Hegel, Auguste Comte, and Karl Marx. The second, perhaps even more dangerous, is to seek an abstract and ahistorical general theory of human action, what Mills (1959, p. 23) called Grand Theory. That is, "a systematic theory of 'the nature of man and society.'" The theory of choice computation under scarcity constraints of neoclassical economics comes to mind as a suitable example. The third tradition which hampers the sociological imagination is the danger of falling into pure historicism, the gathering, collection, and accumulation of "a series of unrelated and often insignificant facts."

However, North's pursuit of a Grand Theory to understand the nature and process of economic growth and social change is not reduced or confined in Mills' definition above, as we intend to demonstrate. Indeed, it is North's theoretical originality to amalgamate grand theorizing with historical and social context (i.e., what Mills called sociological imagination) to explain different institutional architectures, their dynamics, and their performance throughout history. Asked if he would agree that he specialized in "grand theorizing," North (2008, p. 207) replied: "Yeah, that's certainly the right way to put it. It is grand theorizing." The Grand Theory quest is not restricted to economics or any singular academic discipline. It is a multidisciplinary effort to create what North would designate as a New Institutional Social Science (see Kling and Schultz, 2009, p. 149). Thus, it is a task much broader in scale and scope than the generally delineated in New Institutional Economics - an approach for which North is popularly known. As he put it in an interview with Brian Snowdon (2016, p. 124),

> "If you want to change the world you need to understand the process and dynamics of economic change. Neoclassical economics was not developed to deal with these grand issues. But to understand the dynamics of change requires a multidisciplinary approach involving knowledge from all the social sciences as well as an understanding of how societies learn. We need grand theorizing to understand the rise and fall of nations."

In this essay, we provide a detailed historical account of Douglass North's early multifaceted theoretical contributions and analytical developments in pursuing a Grand Theory for why some countries are rich and others poor. The systematic, continuous, and profound attempt to answer the Smithian social coordination problem shaped his journey from being a young self-defined serious Marxist in his Berkeley undergraduate days in the 1940s to becoming one of the founders of New Institutional Economics in the early 1980s. In the process, North was converted in the early 1950s into a rigid neoclassical economist, being one of the intellectual leaders in promoting the New Economic History revolution in the mid-1950s and early 1960s. This movement consisted of the systematic application of traditional economic theory and quantitative econometric methods to the field of economic history.

However, in the late 1960s and early 1970s, North surprisingly became a deep critical voice of the cliometric movement, particularly the neoclassical theoretical apparatus embodied in its

approach. The pronounced tension between North's pioneer early work on promoting cliometric research and his subsequent development of New Institutional Economics in the late 1970s and onwards is mainly unexplored in previous discussions on his intellectual evolution. There is a strong tendency in the literature regarding his contributions to overlook the organic whole and the endogenous tensions of his research agenda progression. This omission is particularly relevant in the disregard of the increasing intrinsic antagonism of North's promotion of neoclassical economic theory embodied in cliometrics and his ensuing advance of institutional and organizational analysis.

New Institutional Economics was born as a consequence of the failures of standard neoclassical economic theory to deal with several problems. These scientific puzzles range from why firms exist and how they operate in connection with (but not only) decisions to make within internal organizations or to buy in the market, the existence of diverse organizational arrangements present in advanced market economies, and the nature and causes of economic growth.[21] In the last decades, new economic historians have expressed great admiration for North's instrumental role as one of the founding fathers of New Economic History (e.g., McCloskey, 1994; Goldin, 1995). Similarly, new institutional economists have praised North's *avant-garde* groundbreaking work in increasingly expanding the strict domains of neoclassical economics in a process that eventually gave birth to New Institutional Economics (e.g., Myrhman and Weingast, 1994; Ménard and Shirley, 2014).

Nevertheless, there is insufficient work trying to incorporate all these formative, progressive, and antagonist elements in a coherent analytical historical narrative that accounts for North's changing theoretical and historiographical views. Therefore, for instance, Claude Ménard and Mary Shirley's chapter on "The Contribution of Douglass North to New Institutional Economics" (2014, p. 18) only mentions *en passant* his cliometric contributions justifying that it is "another subject in its own right" and starting their discussion only in 1968. Similarly, Matthijs Krul (2018, p. 34) states that "North's Cliometric period is not generally considered significant within either his own career or its lasting influence on economics - it is generally mentioned only

[21] As Oliver E. Williamson (1975, p. 1) put it in the book that coined the term New Institutional Economics, a common principle that encompasses the broad range of fields that formed this body of thought is "an evolving consensus that received micro theory, as useful and powerful as it is for many purposes, operates at too high a level of abstraction to permit many important microeconomic phenomena to be addressed in an uncontrived way."

in the context of North's shift away from it, toward institutional analysis."[22] Indeed, Sumner La Croix (2018), a former Ph.D. student under North's supervision, is a rare exception in providing an excellent overview and synthesis of his mentor's contributions and their relations with cliometrics, neoclassical theory, and institutional economics. Nevertheless, La Croix (2018) inevitably also focuses most of the attention on North's work from the early 1970s onwards.

Graham A. Brownlow (2010) approached some aspects of dealing with the intricate whole of North's intellectual corpus. However, his prime analysis is on the continuities and changes within North's historiographical views from a methodological perspective. Thus, following the three stages division of North's intellectual development proposed by Groenewegen, Kerstholt, and Nagelkerke (1995), Brownlow (2010, p. 308) argues that North I, from the 1950s to 1971, is predominantly a new economic historian focusing on applying neoclassical economics to historical topics. In his turn, from 1971 to 1981, North II could be classified as a mix between a new economic historian and a historical economist. In this period, his work is marked by extending neoclassical analysis to institutional choice. Finally, from 1981 onwards, North III can be read as predominantly a historical economist. In this phase, North refined the neoclassical model incorporating largely ignored themes in the standard theory, particularly questioning the objective rationality postulate.[23]

This periodization is not without controversy. Indeed, as Michel Zouboulakis (2005) argues, we could add that North III did much more from 1981 onwards than to refine the neoclassical

[22] Moreover, North's work has attracted substantial attention from heterodox economic approaches. These are more inclined to deal with the multidimensional aspects of his research agenda. However, these interpretations tend to give prime focus to the similarities and differences between North and heterodox traditions, such as Marxism and Old Institutional Economics. Thus, many interesting but divergent Marxist interpretations have appeared (e.g., Wisman, Willoughby, and Sawers, 1988; Fine and Milonakis, 2003; Milonakis and Fine, 2004, 2007). Similarly, a myriad of old institutionalist authors reacted by trying to build bridges and integrating the various institutional approaches (e.g., Groenewegen, Kerstholt, and Nagelkerke, 1995; Fiani, 2004), assessing in a comparative analysis old and new traditions (e.g., Rutherford, 1996, 2001; Fiori, 2002; Vanderberg, 2002; Broda, 2021), and stressing fundamental differences and incompatibilities (e.g., Dugger, 1995).

[23] This three-part research division of North's career was advanced by David W. Galenson (1983). As Groenewegen, Kerstholt, and Nagelkerke (1995, p. 472) write, "North has gradually moved away from a predominantly deductive explanatory strategy to one that is more clearly characterized by a back and forth between empirically established relationships and explanatory models carefully designed to do the job of explaining." Brownlow (2010, p. 311) argues that this is closer to the methodological vision of historical economics (e.g., as represented by Charles Kindleberger) and the old institutionalist tradition (see Hodgson, 1998). In Brownlow's (2010, p. 311) opinion, as North became more accepted in the professional mainstream, he became increasingly more revolutionary. Brownlow maintains that this tension is understandable and easily resolved when considering that mainstream economics has shifted and changed considerably since the 1980s (cf. Colander, 2000). The correlation appears to exist. However, it is not trivial to determine the causation between these two intellectual movements. Indeed, one could easily make a case for the opposite causation.

standard model, making a turn towards historical-evolutionary economics and cognitive science. In contrast, North's former Ph.D. student and co-author John Joseph Wallis (2016, p. 938) correctly emphasizes "the unchanging core" of North's research agenda. As Wallis writes, North "followed Adam Smith's insight that growing specialization was the primary source of improved economic performance. Doug became famous for work that went 'Beyond the New Economic History,' but everything he did was rooted in the central question that launched the new economic history: How do we understand what determines the economic performance of societies? That perspective informed his work until the very end." Therefore, how can we reconcile these different readings and views regarding the continuities, progressions, and changes in North's evolution as a social scientist? We argue that North's unchanging core encapsulated in the Grand Theory quest can be interpreted as the primary gravitational force encompassing the increasing tensions within his adopted neoclassical theoretical framework.

The tension between the received economic tradition and its failure to account for institutional structures and economic change urged for progressive theoretical innovations, shaping the streams of North's analytical developments. The success of the cliometric revolution exposed the frailties of the movement itself, i.e., the limitations of neoclassical economic theory to explain economic growth and social change. The cliometric pudding proof was to eat it. Indeed, North was one of the field's leading figures, proponents, and influential teachers. Moreover, the economics profession embarked on the revolution (as measured by job offers in economic departments, publications, research impact, *etcetera*). In this process, however, North perceived the inadequacy of neoclassical analytical instruments to account for a successful explanation of economic performance and social coordination. In his perspective, the critical failure of cliometrics as an approach to economic history is that neoclassical economics does not explain evolving economic structures and performance through time, the central task of economic history.[24]

This essay investigates the early period of North's thinking, particularly focusing on the interval spanning his first published scholarly article in 1950 to his path-breaking book on *Structure and Change in Economic History* (1981). We give more attention to his gradual development in

[24] North (1978a, p. 77) defines explanation as an act of explicitly theorizing and searching for the potential of refutability. The structure is defined "as those characteristics of society that we believe to be the basic determinants of performance," which includes "the political and economic institutions, technology, demography, and ideology." Performance is understood as expressed in the main standard measures of economic output, per capita income, and income distribution.

published articles instead of his finished product books which had received much more discussion. As described by Wallis (2016, p. 938), this early period is generally neglected, with most of the contemporary attention devoted to the sequence of his famous books starting from *The Rise of the Western World: A New Economic History* (1973), co-authored with Robert Paul Thomas. We intend to provide a more comprehensive and organic historical reconstruction of North's three-decade initial pursuit of a Grand Theory for why some societies are rich and others poor. This journey marked his first steps in making a New Institutional Social Science, comprehending lines of continuities and progressions but also ambiguities and antagonisms.

In the period analyzed, North's response to the Smithian fundamental problem lies in the causes of political and economic institutions, institutional change, and its impact on economic growth. North (1990a, p. 3) defined institutions as "the humanly devised constraints that shape human interaction" in coordination, cooperation, and competition. An institutional matrix is composed of formal rules (e.g., constitutions and written laws), informal constraints (e.g., cultural norms, social conventions, and habits), and the effectiveness of their enforcement (which are carried by delegated third parties, second parties retaliation, or self-imposed codes). Pursuing a theory of constraints evolution that determines choices throughout time led him to incorporate transaction costs (in addition to standard neoclassical production costs), property rights, and contracts to explain divergences of economic performance across multiple social environments.

In conjunction with technology, institutions condition marginal transaction and transformation production costs, directly shaping the extent of impersonal exchange, market coordination, and economic performance. Moreover, institutions and technical progress are intimately connected and mutually dependent on different gradations. In "The Nature of the Firm" (1937), Ronald Coase first introduced the idea of transaction costs, arguing that the existence of firms and their relative extension are determined by the costs of engaging in a market marginal transaction, such as the costs of discovering and keeping track of the relevant prices, determining the quality and bargaining price, monitoring and enforcing the contractual agreement, etc.

Property rights refer to the set of permissible decisions to command an economic resource, the rights to perform certain actions with its legally or socially normatively defined benefits and costs. It is a bundle of rights in general attached to a physical commodity or service exchanged in the market, as Coase hinted in "The Problem of Social Cost" (1960). This property rights notion was developed further by Armen Alchian (1965), Harold Demsetz (1967), Yoram Barzel (1989),

and others. In "Towards a Theory of Property Rights" (1967), Demsetz argued that property rights arose when it became the most efficient institutional arrangement in a society, i.e., when its economic benefits surpassed its costs. As Demsetz (1967, p. 350) writes, "property rights develop to internalize externalities when the gains of internalization become larger than the cost of internalization. Increased internalization, in the main, results from changes in economic values, changes which stem from the development of new technology and the opening of new markets, changes to which old property rights are poorly attuned. [...] But, given a community's tastes in this regard [for private versus state ownership], the emergence of new private or state-owned property rights will be in response to changes in technology and relative prices."

Based on the work of the anthropologist Eleanor Leacock, Demsetz (1967, p. 351) supported this thesis by documenting the case of the Montagnais tribe in Northeast Canada. In the early eighteenth century, this tribe of Indian hunters developed exclusive rights to take beaver furs from hunting grounds - an experience that contrasted with the American Indians in the Southwest who failed to develop well-defined property rights of hunting lands. In his early work on institutional and organizational analysis, North adopted this admitted naive emergence theory of property rights.[25] Similarly to property rights, contracts are intrinsically incomplete and costly to measure, define, and enforce. With transaction costs, the institutional framework in which property rights and contracts are measured, defined, and enforced assumes a prominent role in explaining the capacity to capture the gains derived from the division of productive labor and social cooperation through impersonal exchanges. In addition, the transaction costs notion opened a whole new territory regarding the supply and choice of institutions, in particular, a theory of the state that defines the property rights structure and enforces impersonal contractual arrangements and the role of ideology that frames the collective choice of the institutional architecture in a free-riding context.

## II. FROM A SERIOUS MARXIST AND PACIFICIST TO A VERY RIGID NEOCLASSICAL, CHICAGO-TYPE ECONOMIST

[25] As Thráinn Eggertsson put it in his well-known book *Economic Behavior and Institutions* (1990, p. 215), an extensive survey of the New Institutional Economics literature, "[w]e refer to some of these early attempts as the naive theory of property rights because they seek to explain the development of exclusive property rights without explicitly modeling in social and political institutions."

In 1938, Douglass North enrolled at the University of California at Berkeley. North was born in 1920 in Cambridge, Massachusetts, and he had been accepted into Harvard when he was about to go to college. However, his father was offered the head position of the Metropolitan Life Insurance Company office on the west coast and the family moved to San Francisco. Considering that North did not want to be that far from his family and his brother was at Stanford, he decided to go to Berkeley instead. In 1942, North graduated with a triple major in Philosophy, Political Science, and Economics, getting a C average in all the subjects. The reason was that North (2008, p. 199) led a little leftist protest at Sather Gate in Berkeley during 1940-42.

In his sophomore and junior years at Berkeley, with the social problems of the Great Depression vividly in mind, North (2009, pp. 159-60) became a radical. He discovered Karl Marx, becoming a convinced Marxist. "Marx just had answers to everything," he recollects.

> "I don't know how anyone could avoid being a radical in those days, as surrounded by problems as we were. And so I drifted into being a Marxist. Not a Communist, a Marxist. That's a big difference. [...] I was a serious student of Marx. I read his *Capital*. Not many people have read that book, but I did. I read lots of Marx. That was a big influence on my life, and it still is. I'm not a Marxist anymore, but still, he had an enormous impact."

In North's (1986) perspective, the great significance of Marx to the study of society is grounded in his grand vision of social evolution based on materialistic historical stages or modes of production. Indeed, Adam Smith and many other proponents of the Scottish Enlightenment had already theorized about the different stages of human material reproduction based upon different modes of subsistence. In Book V of *The Wealth of Nations*, for instance, Smith famously discusses progressive social stages associated with historical means of production. Smith presents these stages as the hunting, pastoral, agrarian, and commercial societies.

However, in North's point of view, Marx's major contribution reverberates in particular to an analysis of the complex dynamic co-evolution of what he called the productive forces (mainly shaped by technology and technical progress) and the relations of production (the institutional social structure conditioned by the political and property rights system). The strength of Marxian theory was to link the materialistic economic processes to political, ideological, and cultural institutions. Indeed, in North's (1981, p. 61) opinion, "[t]he Marxian framework is the most

powerful of the existing statements of secular change precisely because it includes all of the elements left out of the neoclassical framework: institutions, property rights, the state, and ideology." As North (2009, p. 159) would synthesize many years later, Marx's grand influence was realizing all the fundamental right questions, even though Marx and his followers had not very good answers.

With the surprise military attack on Pearl Harbor by Imperial Japan, on December 7, 1941, the United States precipitated its entry into World War II. Before the war, North hoped to go to law school. However, his plans changed drastically as he graduated from Berkeley in May 1942. North (2009, p. 159) was a resolute pacifist and conscious objector to the war. North adopted an unrelenting and intransigent position that he did not want to kill anybody in the conflict. In consequence, he joined the U.S. Merchant Marine as a cadet. "People could shoot at me but I wouldn't shoot back," he wrote. In two days of being in the sea, North was called to become a navigator. He was the only one in the crew that went to college so he seemed more suitable to learn the subject of navigation.

In the war years, North (1997a, p. 253) had much free time during his repeated trips from San Francisco to Australia. The same was true when he was sent to the Pacific front lines in New Guinea and the Solomon Islands. Therefore, he was given "the opportunity of three years of continuous reading, and it was in the course of reading that I became convinced that I should be an economist." In 1944, North was designated as an Instructor in Celo-Navigation at the Maritime Service Officers' School in Alameda, California. The Berkeley economist Paul S. Taylor persuaded North to become an economist. At the same time, documentary photographer Dorothea Lange, Taylor's second wife, persuaded North to become a photographer.

In January 1946, North returned from his military service at the Merchant Marine and applied to graduate school. Given his poor record as an undergraduate student, the only place that agreed to take him for at least one semester was Berkeley. In February 1946, North enrolled in Berkeley for his Ph.D. studies. When he returned to Berkeley, North (1997a, p. 254) had a clear and intense desire to improve the world. To achieve this goal, he needed to understand how the economy worked and could be successful. Then, in the second step, he would have the instruments to improve economic performance. This ambition led him to study economic history. "My objective as a graduate student," he recalls, "was to find out what made economies work the way they did or fail to work. Economic history appeared to be the best field for this objective."

In this sense, North (2008, p. 198) states that "I've got a single-minded objective. I started out with that view in 1944, and I still have it today; it's a guiding factor that is still shaping the way I'm trying to evolve."

As a graduate teaching fellow at Berkeley between 1946 and 1949, North finished his graduate work in the fall of 1950. Interestingly, North (2009, p. 162) decided to research the history of the business that his father wanted that he had followed. He chose to write his Ph.D. dissertation on the history of life insurance companies. As he put it, his "Ph.D. dissertation was a muckraking attack on life insurance companies, something that my father wasn't enthusiastic about, to put it mildly." North (2009, p. 163) was supposed to write his dissertation under the supervision of the American economic historian Sanford Mosk. However, Mosk rejected North as his student saying: "North, you're never going to be any good." As a result, Melvin Moses Knight (one of two distinguished economists who also were Frank H. Knight's brothers) turned out to be North's dissertation adviser and mentor.

M. M. Knight figured highly among the "salty individualists" at the University of California, as described by an obituary (Borah, Davisson, and Mosk, 1988). He was an utterly interdisciplinary character, as North would strive to be in his life project of constructing a truly interdisciplinary social science. Knight emphasized the evolutionary dynamics of the scarcity economic problem imposed on society subject to geographical and resource endowment constraints. In "Water and the Course of Empire in French North Africa" (1928), Knight analyzed "the millennial relation between physical changes in man's environment and the structure of economic organization from prehistory through the Roman and Arab periods to modern times" (Pontecorvo and Stewart, 1979, p. 242).[26] In retrospect, North was deeply influenced by Knight's eclectic and holistic views on the economic approach to history.

As Pontecorvo and Stewart (1979, p. 243) write in their tribute, Knight is a theorist of economic change and thinks "big and long." He was primarily "preoccupied with the ultimate limits to growth within each economy." In this sense, Knight differentiates himself from the neoclassical static general equilibrium analysis and the early American institutionalist movement in integrating institutions in the context of the economic problem faced by any society.[27] North

[26] From the mid-1920s onwards, Knight published extensively on European economic history, including two books on *Economic History of Europe to the End of the Middle Ages* (1926) and, with Felix Flugel and H. E. Barnes, *Economic History of Europe in Modern Times* (1928).

[27] In the words of Pontecorvo and Stewart (1979, p. 243), Knight has a "deep fundamental concern with the problem of the nature of economic scarcity and society's response to scarcity through time [...]. He transcends [Thorstein]

(1997a, p. 254) describes Knight as certainly an agnostic about theory. In another place, North (2009, p. 163) says that "Knight didn't believe in economic theory, but he knew an enormous amount. [...] His economic history was story-telling through time. It was very good, endless story-telling. M. M. Knight told damn good stories. I'm still impressed. I learnt a lot from him - but not much theory. Obviously, there was a lot of implicit theory in it, even though he didn't think so. But there was."

Despite Knight's extensive historical and theoretical knowledge and his exciting personality, North questioned the lack of a more rigorous theoretical framework to structure the fundamental process of economic evolution that he and his mentor set out to understand. Indeed, deeply influenced by his French connections, Knight may be classified closer to the French historian Fernand Braudel's *École des Annales* but with an evolutionary perspective. North (2008, p. 211) states that Knight's "approach could be called institutional description - rich in historical detail but devoid of explicit theoretical content." Nevertheless, Knight's geographical emphasis and implicit regional growth theory will be appropriated and worked out by North within a neoclassical analytical model in his early publications on location theory and export-led regional economic growth. Moreover, some of Knight's intuitions are surprisingly similar to what North would evolve in his more mature intellectual developments. Pontecorvo and Stewart (1979, pp. 244-5) summarize Knight's vision of social evolution as follows.

> "Each society is constrained by its own geographic and resource endowments. Each therefore responds to the problem of scarcity in its own way and creates its own institutions or transforms those it borrows. Regardless of the form of the response, the process of expansion works overtime to use up the opportunity. [...] Once an opportunity is used up, it requires both technological development and a reordering of social institutions to create a new set of human opportunities and this is a formidable social task of the true long run. [...] unlike the essentially optimistic cast of Marxian inevitability, Knight has a strong sense that systems run down and because they are located in space as

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Veblen and especially [John Kenneth] Galbraith and [Walt W.] Rostow by his concern with the evolution and the full extent of economic structures. While Veblen was concerned with the industrial economy and its linkages to other elements, e.g., finance, etc., Knight's view is both more holistic and more focused on the evolutionary and disequilibrium properties of economic systems. [...] Knight adds a strong sense of geography, of place, and the ecology of place. In this particular way, he reveals his links both with his rural origins and with the traditions of French economic history."

> well as in time, systems that have exhausted themselves do not necessarily get transformed and revived but tend to be replaced, as were Egypt and Rome and North Africa."

In 1950, North was awarded a Social Science Research Council Fellowship to go to the east coast and work on his Ph.D. research. He went back to live in New York, where most life insurance companies were located, including the one of his father. While in New York, North sat in Robert Merton's sociology seminars at Columbia University, making contact with the Harvard well-known sociologist Talcott Parsons. Through Parsons, North (1997a, p. 254) became deeply involved with the Research Center in Entrepreneurial History founded in 1948 and directed by Arthur H. Cole at Harvard. The Austrian economist Joseph A. Schumpeter was an early member and the referential foundational figure of the center.[28]

In 1949, the center published the first issue of *Explorations in Entrepreneurial History* (later renamed *Explorations in Economic History*), with the driving theme being the connections between entrepreneurial and business history and economic growth. North was greatly influenced by Schumpeter's view of economic history as embodied in the broad concept of the science of economics or social economics. In his monumental *History of Economic Analysis* (1954, p. 124), Schumpeter argued that the science of economics was composed of four fundamental parts, i.e., economic history, economic theory, economic statistics, and economic sociology. "What distinguishes the 'scientific' economist from all the other people who think, talk, and write about economic topics," Schumpeter wrote, "is a command of techniques that we class under three heads: history, statistics, and 'theory.' The three together make up what we shall call Economic Analysis." This vision was developed by Cole's belief in economic history as centered on the entrepreneurial figure.

In 1950, North published his first article on "Some Recent Views of the Modern Large Corporation" (1950) in *Explorations*. In the fall of 1950, although still working on his thesis,

[28] In 1927, Parsons earned a D.Phil. in Economics from the University of Heidelberg, being in this same year appointed an instructor in the Department of Economics at Harvard. In 1927, Parsons first met Schumpeter when the Austrian was at Harvard as a visiting professor. As Richard Swedberg (2015) documents, Parsons was much more influenced by Schumpeter than vice versa. In particular, Parsons was immediately attracted to the notion of a theoretical system or analytical economics that he had learned when he sat in Schumpeter's course in "General Economics" in 1927. In addition, Parsons was involved in the Center in Entrepreneurial History, although in a more marginal fashion. The most famous product of this Schumpeter-Parsons lineage is the business historian Alfred D. Chandler (1977), who employed an institutional-sociological approach to analyze the managerial structures of modern corporations.

North got his first academic appointment as an Acting Assistant Professor at the University of Washington in Seattle. In the same year, Canadian-born Donald F. Gordon also joined the department. Nowadays, Gordon (1955a, 1955b, 1974) is known for his critique of Paul A. Samuelson's (1947) operationalism methodology and his research on the neoclassical microfoundations of Keynesian unemployment and the Phillips Curve. Among his colleagues, Gordon was particularly known for his all-around knowledge of economic reasoning and price theory. In Seattle, North and Gordon played chess every day from 12 to 2 p.m. for four years. North reported that he beat Gordon at chess all the time. In the meantime, Gordon taught him economics.

As North (2009, p. 164) recollects, Gordon "taught me economics. I knew so little economics that, when I graduated, I had just memorized all the right answers for the exams and reproduced them. I didn't know any economics, not even simple price theory." North (2008, p. 199) recalls that he got distinguished in his Ph.D. written exams, but he could not answer any simple sophomore-level question in economic theory in the oral exam. This generated a long debate in the faculty about whether to pass him or not. As he re-learned price theory with Gordon, North realized that Marxism was unable "to answer a lot of mundane questions, such as prices." This was the last step to his rejection and final abandonment of Marxism. As a result, in his words, he "became a very rigid neoclassical, Chicago-type economist." However, in contrast with the explanatory power of price theory in some areas, North noted that the fundamental questions that Marx posed "were still out there and couldn't be answered by standard economic theory."

In 1951, North became an Assistant Professor at the University of Washington, Seattle. One year later, in 1952, North completed his Ph.D. dissertation. In his first published works, influenced by his contact with Cole's Center at Harvard, North focused on expanding and developing his dissertation analysis of major life insurance companies and their close-dependent relationship with investment banking. In 1952, he contributed a chapter on "Capital Accumulation in Life Insurance Between the Civil War and the Investigation of 1905" in William Miller's edited book, *Men in Business: Essays in the History of Entrepreneurship* (1952). This was followed by an article on "Entrepreneurial Policy and the Internal Organization in Large Life Insurance Companies at the Time of the Armstrong Investigation" (1953) published in *Explorations* and "Life Insurance and Investment Banking at the Time of the Armstrong Investigation" (1954) in the *Journal of Economic History*.

In the last essay, North (1954, p. 209) explores the investment bankers' role in the organization of financial institutions "and their significance for the development of these institutions and their reorientation toward the securities market." North found that the dependent relationship of the big insurance companies with investment bankers explained the financial policy decisions made by these companies. Therefore, the major life insurance companies were neither mere adjuncts nor separable from the banking community. The insurance companies became affiliated with banking houses and their interests because "they required guaranteed outlets for their continuously expanding accumulation of investable funds" and these outlets were controlled by the banking community (e.g., investments in railroads, industries, and public goods). Moreover, the insurance companies and their subsidiaries allowed the banking houses great flexibility in using their funds.

North (1954, pp. 225-6) concludes that the insurance companies occupied a dependent and junior partner role in their association with investment bankers, benefiting from reciprocated services but still not capturing a significant part of the related trade gains. "Their status was that of a junior partner rather than merely a subsidiary. But it was clearly a one-sided arrangement in which the great bulk of the advantages accrued to the investment banker rather than to the insurance company. The officers of the insurance company on the other hand were most handsomely treated by the investment bankers." Thus, the nature of the association between the major life insurance companies and the banking houses was a relevant explanatory element in the reigning supremacy of the latter.

In 1955, North published his first major article on "Location Theory and Regional Economic Growth" (1955) in the *Journal of Political Economy*. North contends that location theory and the sequences of stages delineated by standard regional economic growth did not provide an empirically validated framework to analyze American economic history. The typical regional economic growth theory, e.g., as exposed by Edgar M. Hoover (1937) and August Lösch (1938), describes a sequence of stages of a region's development from a self-sufficient subsistence region to an economy specialized in tertiary exporting industries. Indeed, location theory mainly formulated this sequence based on the stylized historical experience of European economic growth that started with subsistence local economies linked with the manorial system.

Such experience is significantly different from American development. Since its beginnings, North (1955, p. 245) argues, subsistence was only a frontier condition. "America was exploited

in large part as a capitalist venture. Settlement in new regions and their subsequent growth were shaped by the search for and exploitation of goods in demand on world markets." Therefore, "location theorists and the early stages in the theory of regional economic growth appear to be taken uncritically from European experience rather than derived from" the American economic history (p. 247). In North's opinion, a more productive framework was developed by Harold Innis' "staple thesis." Innis (1920, 1933, 1940) attempted to structure Canadian social, political, and economic development history as decisively shaped by a sequence of exporting staples commodities (e.g., fur, fish, lumber, wheat, coal, and metals). North (p. 257) sustains that "the concept of a region should be redefined to point out that the unifying cohesion to a region, over and beyond geographic similarities, is its development around a common export base."

On this ground, North proposed a new analytical framework for regional economic growth from which he constructed his staple (defined as the chief commodity produced by a region) neoclassical theory of economic growth. According to North (1955, p. 257), "[t]he success of the export base has been the determining factor in the rate of growth of regions. Therefore, in order to understand this growth, we must examine the locational factors that have enabled the staples to develop." The export base also determines the development of residentiary secondary and tertiary activities as domestic income grows and investment flows to subsidiary industries. He defines four types of manufacturing that can be developed as a result of increased residential income: (i) materials-oriented industries, (ii) service industries to the export industry, (iii) residential industries oriented to local consumption, and (iv) footloose industries (i.e., where transportation costs are not a significant component in location).

Except for the footloose industries, North (1955, p. 253) maintains that all other manufacturing industries "develop naturally because of locational advantages in a society responsive to profit-maximizing stimuli. There is nothing difficult about the development of such industries. The difficulties arise when promoters seek to develop industries which simply are unsuited for the area and which can therefore only be maintained under hothouse conditions." Moreover, the export base also directs local political pressures that provide for concerted collective action toward reducing transportation costs, improving technological progress in connection with the export base, and mobilizing state and federal supply of public goods and social overhead benefits. These elements will establish the possibilities for economic growth and, in

consequence, the widening of the export base as the region develops until the point at which the export base ceases to be identified as a region.

One main implication of this theory is that the standard view that industrialization is a difficult but necessary and indispensable condition for sustained economic development is not maintained. *Au contraire,* North (1955, p. 254) concludes that, first, "there is no reason why all regions must industrialize in order to continue to grow." Second, a "great deal of secondary (and tertiary) industry will develop automatically either because of locational advantages" or as a result of the induced investment of the growing income derived from the export base. Third, the concept of industrialization *per se* is ambiguous and needs further clarification. In North's (p. 257) view, in short, industrialization "may be neither necessary nor desirable." "There is nothing to prevent population and per capita income from growing in a region whose export base is agricultural. Moreover, there is nothing difficult about developing secondary and tertiary industries in such a region. Indeed, it will develop automatically."

## III. THE GRAND THEORIST OF NEW ECONOMIC HISTORY

The birth of New Economic History, or cliometrics (a term coined by the Purdue mathematical economist Stanley Reiter based on Clio, the Greek muse of history, and metrics, the art of measurement), is dated in September 1957.[29] On this occasion, the 24th Conference on Research in Income and Wealth occurred in a joint meeting organized by the Economic History Association (EHA) and the National Bureau of Economic Research (NBER) in Williamstown, Massachusetts. New Economic History, a term created by North (Hughes, 1982), is the systematic application of economic theory and quantitative methods to the field of economic history, with particular reference to testing alternative hypotheses in interpreting historical data. It emphasizes the construction and specification of historical models derived from economic theory such that its logical implications can be refutable by empirical testing.[30]

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[29] The term cliometrics appeared in print for the first time in an article by Lance Davis, Jonathan Hughes, and Stanley Reiter on the "Aspects of Quantitative Research in Economic History" (1960, p. 540). They write that "the logical structure necessary to make historical reconstructions from the surviving debris of past economic life essentially involves ideas of history, economics and statistics… [and this] has been labeled 'Cliometrics.'"

[30] Deirdre N. McCloskey called this approach *Econometric History* (1987), i.e., a history based on economic theory with statistics and quantitative measuring methods (thus the econometric part). The term is already present in the title of Fogel's (1964) classic book derived from his Ph.D. dissertation at Johns Hopkins University.

The Swedish political economist and economic historian Eli F. Heckscher was the first to assert the essential role of economic theory in the historical treatments of economic phenomena in his "A Plea for Theory in Economy History" (1929). According to Heckscher (1929, p. 526), since the economic problem is fundamentally the same in all ages, "it is difficult to escape the conclusion that economic theory can be of value to the understanding of economic phenomena at all stages of human development." This conclusion is valid even though different institutional engines were employed to solve the same economic problem. Thus, Heckscher continues, we must "repudiate the idea of economic theory and Economic History as belonging to different stages of human development; they are both essential to an understanding of all periods of history, including the present one."

According to Heckscher (1929, p. 529), economics is not concerned with any particular set of external facts but it is a point of view. Therefore, economic theory is indispensable to the very choice of historical facts and, more importantly, to the explanation of these facts. Similarly to Heckscher, in his inaugural lecture at the London School of Economics, Thomas S. Ashton (1946) vividly argued for economic historians to walk with both feet of deduction and induction in their scientific craft. In this context, for instance, Ashton's celebrated book on *The Industrial Revolution, 1760-1830* (1948) and Walt W. Rostow's book on the *British Economy of the Nineteenth Century* (1948) were earlier efforts to apply in a systematic fashion economic analysis to historical phenomena of the past.

Regarding the emphasis on quantitative measurement in economic history, we can trace back the cliometric approach to the pioneering work of the British economic historian John Clapham, who in 1928 became the first Professor of Economic History at Cambridge University. Indeed, Clapham's three-volume book *An Economic History of Modern Britain* (1926-1938) was seminal in its quantitative *modus operandi* to economic history. In 1929, in addition, the International Scientific Committee on Price History was created by William H. Beveridge and Edwin Francis Gay with a grant from the Rockefeller Foundation (see Cole and Crandall, 1964).

In the 1930s, this international collaborative project gave birth to a series of books including, but not limited to, Earl J. Hamilton's work on Spain (1934, 1936), Henri Hauser's work on France (1936), Arthur H. Cole's work on the United States (1938), Alfred F. Pribram's work on Austria (1938), Beveridge's work on England (1939), and Nicolaas W. Posthumus's work on Holland (1943). As already mentioned, in connection with the discussion above, the work of the

Center in Entrepreneurial History at Harvard under Cole's leadership was, as North (1968c, p. 468) writes, "an early (and perhaps premature) attempt to synthesize the social sciences in order to establish a more comprehensive theoretical framework for economic historians."

With the end of World War II, the renewed and growing interest of the economic profession in economic growth, the formalistic revolution allied with the rise of econometric techniques, and a massive volume of new quantitative statistics and information about the past economies led to a pressure of change in the state of economic history. In the late 1950s, influenced by the dominant positivism in the philosophy of science, John R. Meyer and Alfred D. Conrad (1957) published their significant paper dealing with historical causality and explanation in a stochastic universe. They discuss how economic theory, statistical inference, and general laws of causality could be applied in the form of historical hypotheses stated in objective probabilistic terms in economic historiography.

In 1956, North was invited by Solomon Fabricant, then Director of Research, to be a research associate for that academic year at the NBER. Fabricant encouraged North to spend one day a week with Simon Kuznets in Baltimore, while North was working on new estimates of the U.S. balance of payments in the nineteenth century. Kuznets carried Wesley C. Mitchell's torch in the NBER empirical research tradition, especially regarding the U.S. national income accounts. In 1936, Kuznets was the head behind the creation of the annual Conference on Research in Income and Wealth, establishing an international organization counterpart in 1947. Previous work by economists and statisticians produced in the Bureau was pivotal to the cliometric turn in economic history.[31] The EHA/NBER joint conference assembled a proceedings book edited by William Parker, *Trends in the American Economy in the Nineteenth Century* (1960). In the volume, new quantitative economic data for the nineteenth-century United States were provided, such as commodity output, regional income, wage series, prices index, factor shares, and North's (1960a) contribution to the revised estimates of the balance of payments from 1790 to 1860.

The 1957 joint conference was the beginning of New Economic History. However, this research program coalesced when Lance Davis and Jonathan Hughes, two of North's most famous students and who were in his first class at Washington, organized the first annual "Conference on the Application of Economic Theory and Quantitative Techniques to Problems of History" at

[31] As North (1974, p. 188) writes, "[m]any of the earliest contributions to the new economic history were efforts to provide additional quantitative measures of economic growth - indeed, the whole development of national-income accounting pioneered by Simon Kuznets and his followers was a basic impetus to this approach."

Purdue University in February 1960. In this meeting, for instance, Robert Fogel (1964) presented the initial estimations of his classic work on the interregional social savings of the railroads based on the most important innovation of cliometrics, the counterfactual methodology. Furthermore, from 1960 to 1966, North and Parker assumed the editorship of the *Journal of Economic History*, the EHA's scholarly journal.[32] Both promoted the cliometric revolution in the editorship policy and accepted articles.[33] In 1983, the Purdue annual meetings formally originated the Cliometric Society, organized by Sam Williamson and Deirdre N. McCloskey.

Claudia Goldin (1995, p. 195) classifies North as the "grand theorist" of New Economic History, "arbitraging between economic history and organization theory." Indeed, North (1955, pp. 243-4) writes presaging words regarding his emerging ideas on applying economic analysis to history. He asserts that "there is a vast difference between the response of an underdeveloped area where the social and economic structure is not fundamentally geared to capitalist stimuli and the kind of response one can expect in a basically capitalist society." Thus, in his view, for analyzing American growth neoclassical economic theory seems perfectly fitted. However, when dealing with European economic history, underdeveloped regions, and different institutional arrangements throughout history, the application of neoclassical economics can be severely limited. Surprisingly, North is not only very conscious of the potential benefits of this theoretical

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[32] However, North (2008, p. 200) maintains that he and Parker "were sort of pawns in a big game that we didn't really quite know." North (2008, pp. 200-1) remembers that "the Trustees voted to impeach us; that is, they voted to examine whether we should stay on as editors. The basis was complaints (by some people I'll leave nameless) that we were incompetent. So the Trustees then demanded that we explain ourselves. Well, Bill was very nice and cooperative and went before them – and I wrote them a nasty letter saying, "Go jump in the lake. I won't have anything to do with it." I said, "You've made us editors; I think we're doing a good job, and that's that." Now Bill and I disagree about *everything*, you understand – in fact, Bill and I almost came to blows over Bob Fogel's railroad article, which he didn't want to publish as Bob had framed it and I did. But we did compromise – we tried very hard to take account of all the criticism. But we were pawns in a big game: economic history was changing, we were starting to get articles that mirrored this, like Bob's article, and at the same time, why, there was lots of tugging that this was a terrible thing. [...] Between us, however, I think what we did was a landmark for the *Journal*. It's true people complained about things, but the fight was over – that is, that this sort of economic history had an important place and was really part of what economic history was going to be. What proportion it should be, and how it should be done, and things like that, were still controversial, but not that it shouldn't be done and that it shouldn't be a part of the profession. I might add, we got impeached but we didn't get fired; finally, they went back and agreed to continue us, even though with some reluctance on quite a number of the Trustees' parts."

[33] Robert Whaples (1991) measured that the articles that employed the cliometric approach were multiplied by more than seven in the *Journal of Economic History* regular issues from the 1956-60 period to the 1971-75 period. They went from 10 percent of the total articles in regular issues to 72 percent. See also Diebolt and Haupert's (2018) counterfactual estimations. The Harvard Center's *Explorations in Entrepreneurial History* also became dominated by the cliometric young Turks under the editorship of John Meyer. In "The Economics of Slavery in the Antebellum South" (1958), one of the most influential papers within the movement, Anfred Conrad and Meyer demonstrated that slavery had a positive economic rate of return. One year earlier, Meyer and Conrad (1957) published their milestone paper on methodology that would be crucial to the cliometric approach.

transposition but he was also aware of its *prima facie* limitations in explaining most of the global economic history.

> "The reluctance of the economic historian to make more extensive use of the tools of the theorist reflects in good part the fact that most of the world's economic history falls outside our first condition [i.e., falls outside of market institutions] and that therefore economic theory is of little use in analyzing a large part of its development. On the other hand, the joint efforts of economic theorists and historians applied to the development of the United States and of some other areas hold out the promise of yielding valuable insights."

Indeed, this is the research project that North undertook in the remaining 1950s, culminating in his first book on *The Economic Growth of the United States, 1790-1860* (1961a). The project involved first a comprehensive collection and estimation of new quantitative data. Some examples are his quantitative work on international trade and capital flows (North, 1956b, 1960b, 1960c), domestic inter-regional trade, transportation costs with particular reference to ocean freight rates and shipping earnings (North, 1958b; North and Heston, 1960), and aggregate macroeconomic indicators (North, 1961d). The analysis was expanded and developed in his second book on *Growth and Welfare in the American Past: A New Economic History* (1966), spanning from 1600 to the present day. This last book had several revised editions incorporating North's later theoretical developments. In this section, we reconstruct North's path to interpreting American economic history in the late 1950s and early 1960s.

In 1956, North (1956a, p. 165) reacted to Charles Tiebout's (1956) critique of his model regarding the role of the export base in determining regional income and employment. In response, North states that his goal was explicitly concerned with long-run secular economic growth, reaffirming the importance of a region as a unit of analysis. He insists that the "region's significance lies in its being a specialized part of the whole," with different regions having different factor endowments and transportation costs. In his view, America's growth was initiated by its large "land and natural resources capable of producing extractive goods in demand in existing markets." With technological progress, changing factor combinations, and growing domestic income, manufacturing became a profitable activity attracting capital and labor. As the

residential industry mainly depends on income within the region, it can only expand in an induced form by income generated in exports to already established foreign markets. “Therefore, increased investment in residentiary activity is primarily induced investment as a result of expanded income received from outside the region, and, correspondingly, expanded employment in locally oriented industry, trade, and service primarily reflects long-run changes in income received from the export base” (North, 1956a, p. 165).

In “A Note on Professor Rostow’s ‘Take-off’ into Self-sustained Economic Growth” (1958a), North critically addressed the validity of the Rostovian stages model of economic growth with a particular reference to the United States (for the full-worked model, see Rostow, 1960). Rostow (1956, p. 47) defined the take-off as the rise in the rate of investment from 5 to 10 percent or more of national income, the development and accelerated growth of manufacturing industries, and the change in production techniques in such a form that perpetuates the new scale of investment and income. In sum, “the take-off is defined as an industrial revolution, tied directly to radical changes in methods of production.” Rostow (1956, p. 31) categorized the American take-off as occurring in the 1843-60 period, stimulated by capital imports. In the 1840s, the first growth cycle derived from the railroads and manufacturing industries in the East. In the 1850s, the second moment was due to railroad expansion into the Midwest.

However, North (1958a, p. 70) notes that “expansion in the east in the 1840s was accomplished without any significant capital imports.” Moreover, “(1) the boom in the midwest was well underway at the end of the 1840s before any significant amount of capital was imported and (2) the total capital imports for the entire period 1847-60 were very modest.” In contrast, he argues that it was the expanded foreign demand for wheat starting in 1846 which “led to a revival in westward expansion and stimulus to extension of railroads.” North reached this conclusion using the existing estimates of the United States’ balance of payments - and it did not change after he revised the numbers for the 1789-1860 period. North does not argue that capital imports were not relevant to American growth in the period. Indeed, he maintained that these capital flows increased investment into railroads and helped to finance the balance of payments in some periods (see North, 1956b).

However, in North’s (1958a, pp. 71-2) view, “this is very different from saying that they set-off industrialization” or that they triggered the Rostovian take-off. Furthermore, he claimed that Rostow overestimated the role played by the railroads in the 1850s in developing new and

expanding exporting sectors (presumably, wheat and flour). Instead, until the Civil War, cotton in the South drove American export expansion.[34] According to North, Rostow's stages model places a set of pre-conditions on industrialization and wrongly equates industrialization with take-off. In acquisitive societies, Rostow (1956, p. 28) argues that the "take-off fails to occur mainly because the comparative advantage of exploiting productive land and other natural resources delays the time when self-reenforcing industrial growth can profitably take place." However, North contrasts Rostow's hypothesis with American economic history, particularly with New England's take-off experience that began in 1820. New England's textile industry development was possible primarily because of the expanding demand outside the region, greatly influenced by the expansion in income from cotton in the South and wheat, corn, and livestock in the West.

In other words, American economic history supports a very different picture than the one that Rostow's model suggests.[35] The same is true for other countries, such as Canada. In 1958, North (1958b) also published an influential study on ocean freight rates spanning the 1790-1913 period. In this paper, he analyzes new data on ocean freight rates regarding wheat and timber that revealed a long secular decline tendency. North maintained that it only could be explained by technological progress in ship construction. Moreover, he emphasizes the crucial contribution of external economies, the expansion and widening of global export markets, and the role of European immigration in better capacity utilization and round-trips.

In "Agriculture in Regional Economic Growth" (1959), North develops and intertwines these themes and the industry-agriculture dichotomy in regional economic growth, acknowledging that his 1955 model was incomplete. More precisely, the staple export base expansion is a necessary but not sufficient condition for regional development. As taught by Adam Smith, economic

[34] Additionally, Fogel (1964) demonstrated that total (i.e., interregional plus intraregional) social savings of railroads were about 2.7 percent of GNP in 1890. Nevertheless, Fogel's estimations were disputable. In his award-winning Ph.D. dissertation at Harvard University written under the supervision of Alexander Gerschenkron, Albert Fishlow (1965) evaluated the impact of railroads on the antebellum American economy using different counterfactual estimations with different assumptions. Thus, compared to available transportation alternatives in the antebellum period, Fishlow (1965) estimated that the railroad's social savings were 4 percent of GNP in 1858. Extrapolating this number, he estimated that the social savings were at least 15 percent of GNP in 1890. These divergent estimates generated the social savings controversy in the following years. However, both authors agreed that the backward linkages of railroads in other sectors were not as large as Rostow hypothesized because railroads consumed only a limited portion of input commodities such as iron, coal, lumber, and machinery. Therefore, the evidence did not corroborate Rostow's hypothesis that railroads were a leading sector that induced widespread industrialization.

[35] Indeed, North (1958a, p. 74) writes that "one could advance a hypothesis which is the reverse of Rostow's, namely, that the opening up and development of new areas capable of producing primary goods in demand in existing markets induced the growth of industrialization." More importantly, "[i]t is doubtful whether the diverse paths by which economies may expand and/or industrialize can be encompassed into any framework of universal applicability, at least in the present state of knowledge."

growth is determined by productive specialization and social cooperation under the division of labor and knowledge. Production for sale in external markets is the way paved by new regions in their economic development. The division of labor is limited by the extent of the market (see also Stigler, 1951). Nevertheless, a region can remain tied to a single export staple, not diversifying its productive base and not sustaining manufacturing industries, urbanization, and economic growth. This trap can be explained, in North's (1959, p. 945) vision, by three reasons: (i) the natural endowments of the region (at any given level of technology), (ii) the character of the export industry, and (iii) changes in technology and transfer costs. In this argument, North (1959, p. 946) is deeply influenced by Robert E. Baldwin's (1956) discussion on the nature of the export production function, framed by technological and institutional factors. Baldwin compares two economies, an intensive and a non-intensive production economy.

In the intensive production economy, generally associated with plantation-type commodities (such as cotton), the production function is labor-intensive and marked by increasing returns. In the nineteenth-century period, the optimum available organizational structure to exploit these products was large agricultural states concentrated in the plantation house. Those demand bulk capital investments. In the non-intensive economy, export commodities are generally produced in the most efficient form on family-size farms and the production function is relatively less labor-intensive. North extends this analysis by incorporating geographical patterns, natural endowments, and changes in technology and transportation costs. Therefore, the natural endowments initially determine the potential private rate of return for different economic activities. If the production possibilities are of such a nature that one commodity has a much higher return rate than any other economic good or service, productive investment and economic expansion will tend to concentrate on this export commodity. The growth spurring in the region will not necessarily be accompanied by productive structural changes.

The disposition of income from the export industry, the region's propensity to import, and the magnitude of the regional multiplier-accelerator effect are a function of the most efficient organizational arrangement to explore the local comparative advantage and the commodity in which the export base evolves. In the case of a plantation export industry, which exhibits increasing returns to scale in certain margins and is relatively labor intensive, North (1959, p. 946) sustains that regional economic growth will result in a concentrated and unequal income distribution. The bulk of the population will spend their income on basic foodstuff and

subsistence demands. In contrast, the ruling class of "plantation owners will tend to spend most of their income upon luxury consumption goods which will be imported."[36]

This unequal demand pattern obstructs the inducing investment derived from the export base income growth, positively reinforcing the system dynamics around one export staple commodity. Investment and technological progress will flow to explore the plantation more efficiently. Plantation-type commodities require only a limited number of places for product collecting and exporting. The political coalition in power composed of property owners will be reluctant to invest in human capital, technology, and research and development. Thus, regional growth tends to be trapped in its primary exporting economic structure, not discovering, developing, and improving its comparative position in other sectors through active investment in education and knowledge.

On the other hand, a region can present broad production possibilities such that the potential rate of return of different goods and services is not so distant from the initial export commodity that constitutes the regional comparative advantage. In this context, the development of the staple export base takes place *pari passu* with the creation of new domestic segments and the broadening of the exporting sector. A staple export base that is most efficiently produced on a family-sized farm and in which labor is relatively scarce, especially compared to land, results in a more equal income distribution and the encouragement of new economic activities. The region will tend to improve its comparative position through public investments in education and research, broadening the resultant economic base.

The inherent features of transportation costs can considerably influence the regional economic structure and export base. Technical change and its impacts on transportation costs can alter or deepen regional comparative advantage by increasing or decreasing the potential private rate of

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[36] Although neither North (1959) nor Baldwin (1956) mentioned Veblen regarding this point, a connection can be made with Veblen's conspicuous consumer and emulative demand patterns. In his reminiscences, North (1997a, p. 257) writes that "[a]s a graduate student I had read Thorstein Veblen and John R. Commons and been impressed by the insights they provided into the working of economies, but they did not provide a theoretical framework that we could use to explain and analyze economic history. The old institutional economics, because it failed to provide such a theoretical framework, never posed a serious alternative to neoclassical theory." In his John R. Commons Lecture Award, North (1992, p. 3) argues that "[a]nyone who goes back to read *The Legal Foundations of Capitalism* (1924) will find that Commons anticipated much of the evolving literature of the New Institutional Economics. He and the other practitioners of the old institutional economics - Veblen, Mitchell, Ayres - gave us imaginative insights, perceptive description, quantitative measurement. They did not, however, give us theory. And it is the development of an integrated, systematic body of theory that not only is the hallmark of a discipline, but also provides the essential scaffolding for the further development and progress of a discipline. The New Institutional Economics remedies (albeit imperfectly) that theory defect."

return of other goods and services. North notes that an early transportation development that helps to evolve the initial comparative advantage in a determinate staple base will tend to reinforce the dependence on it, creating positive feedback and increasing the potential return of the *status quo* export base. Moreover, in new regions, transportation is, to a great extent, only one way. The outward shipment of a bulky, standardized commodity has no counterpart in an inward shipment. Thus, inward freight tends to be very low, so import goods competition prevents the creation and development of domestic industries. This reinforces the high import propensity picture described in the plantation economy.

North (1959, p. 948) illustrates the two economies delineated above by contrasting the development of the South and West until the American Civil War. From the War of 1812 to the Civil War, the South was a major force of growth with the cotton export base and other subsidiary plantation commodities (such as rice, sugar, and tobacco). Indeed, cotton was the most relevant component of U.S. exports in the period. In the West, an expanding export base developed in wheat, corn, and its derivatives (pork bacon, flour, and whisky). First, the Southern economy was largely concentrated on its dominant single staple exporting base due to its immense comparative advantage. In contrast, the potential return in the West was much more equivalent in different economic activities. Second, given the natural endowments and technology that framed the potential return rates, the most efficient organization in the South was the large-scale plantation reinforced by slavery. In the West, the most efficient social organization to produce wheat and corn at the time was the family-size farm.

These different institutions built for economic exploration of comparative advantages resulted in different patterns of income distribution and consumer demand in the South (extremely concentrated) and the West (more equal). Therefore, the South remained largely apart from the market economy and urban developments. In contrast, the West could grow a myriad of domestic industries devoted to residential demand that eventually matured to become leading exporting industries. Since the cotton trade had such a tremendous return rate, the Southern economy did not produce investment in education, human capital, and technical progress (even within the white population). Thus, the Southern economy exported cotton to the North and Britain. With its interregional trade receipts, it purchased for the most part foodstuffs from the Midwest and industrial goods from the North. With its British trade receipts, the South purchased European luxury goods. Nevertheless, some economic historians contested some elements of this

argument, noting that the Southern plantation farms were self-sufficient in food (e.g., see Goldin, 1995, p. 199).

Third, North (1959, p. 948) adds, "[n]either transportation development or extensive subsidiary industry were required" for the economic efficiency of the exporting cotton trade. "The Factor with his ties with northern credit and shipping served as both the exporter of the planter's cotton, and importer of his foodstuff (from the West) and manufactures (from the Northeast and Europe). Large-scale investment in the South was devoted solely to the opening up of new cotton lands and the acquisition of slaves." In contrast, the substantial investments in railroads and other commutation means in the West were paramount in its formation. The ruling exporting commodities in the West had significant locational gains in the processing and manufacturing of its derivatives. In consequence, North (1959, p. 948) writes, "a variety of such manufacturing grew up and promoted urban development in the West." Fourth, the idiosyncratic characteristics of the ocean freight trade prospected by the one-way cargoes of cotton inhibited the diversification of local industries (a theme developed in North, 1958b). In the West, the great distances and transportation costs naturally protected manufacturing production for local consumption.

According to North (1959, p. 951), the quest for economic growth should not be reduced in the simple formula associated with industrialization, as in the Rostovian model or in the form of the view propagated by John Kenneth Galbraith (1951) that equates agriculture with stagnation. This simple view could not explain many cases of regional growth in economic history, such as the Midwest from 1815-1860, the Pacific Northwest from 1880-1920, and California from 1848-1900. Indeed, this view is also present in some readings of Arthur Lewis' (1954) dual-sector model, in which the capitalist modern sector is defined or understood as the industrial sector, and the non-capitalist traditional subsistence sector is equated with agricultural activities. The relevant point is not "agriculture versus industrialization but rather revolves around a region's ability to become integrated into the larger markets of the world through exports, and of the resultant structure of the regional economy which will influence its ability to achieve sustained growth and a diversified pattern of economic activity."

The co-evolution of factor endowments and initial conditions, institutions, and different paths of development explain the different economic dynamics of Latin and North America, as developed by the influential work of Stanley Engerman and Kenneth Sokoloff (1997, 2000) and

Acemoglu, Johnson, and Robinson (2001). In Book IV of *The Wealth of Nations*, Adam Smith (1776, p. 209) was the first to distinguish between the qualitative difference between a settlement colony versus a purely extractive colony in his chapter VII "On Colonies." In particular, Smith recognizes a major opposition between the Greek and Roman colonies. The Greek colonies were treated as "emancipated children," over whom the mother city "pretended to claim no direct authority or jurisdiction." On the other hand, the Roman colonies were subordinated and seen as a revenue source for the Empire, hampering its economic development.[37]

In *The Economic Growth of the United States, 1790-1860* (1961a), North's seminal contribution can be divided into two distinct but interconnected parts. First, it is a product of extensive data collection and primary empirical work made during the 1950s. Second, North frames all the quantitative work within his staple export-led "skeletal framework," which is primarily designed to interpret the process of American economic growth in the antebellum period. This analytical framework is a composite of three components. The first is Adam Smith's central proposition that specialization and exchange within market coordination are the driving forces of economic growth. Thus, the crucial importance of external trade in extending the market - which set the upper limit to the division of labor. Moreover, there is Innis's staple hypothesis with its emphasis on external trade and the regional export base. It connects with Smith's proposition. Indeed, Innis's hypothesis can be traced to Smith's vent for surplus approach. Finally, Guy S. Callender's (1902) classic three-region model of interregional trade exerted a profound influence. As North (1961a, p. vi) writes in the preface, "I am in his [Callender's] debt."

Callender's classic article on "Early Transportation and Banking Enterprises of the States in Relation to the Growth of Corporations" (1902) delineates an interregional specialization model composed of a manufacturing Northeast, a cotton export base in the South, and a food-producing Northwest. In this way, each region realized its comparative advantage, capturing specialization

[37] Discussing the eighteenth-century colonies, Adam Smith (1776, p. 215) notes that this institutional difference is markedly present in the English and Spanish colonization practices. As Smith explains, the "political institutions of the English colonies have been more favorable to the improvement and cultivations of this land." In the nineteenth century, this theory was developed further by the German historian Arnold Hermann Ludwig Heeren (1760-1842), the founder of the German Historical School Wilhelm G. F. Roscher (1817-1894), and the French political economist Pierre Paul Leroy-Beaulieu (1846-1913). In the mid-twentieth century, it would be independently developed in the works of Baldwin (1956) and North (1959). In his acclaimed interpretation of Brazilian colonial history, the Marxist historian Caio Prado Júnior (1942, 1945) explicitly mentioned Leroy-Beaulieu's typology and spread the dichotomy between settlement and exploitation colonies within Latin American historiography. A few years later, the Brazilian economist Celso Furtado appropriated and stressed this point in his 1959 classic work on *Formação Econômica do Brasil*. See Monastério and Ehrl (2019).

and exchange gains, but subject to transportation costs and an underdeveloped financial system. In his book, North (1961a) focuses attention on the process of incorporating production factors into the realm of inter-regional specialization coordinated by the market price mechanism. In their turn, utility-maximizing individuals adjusted to the market relative price changes, leading to more efficient resource allocations and inducing institutional innovations.

In addition, depending on the natural endowments of the region and the character of the export industry, individuals responding to the profit opportunities signaled by the price system would tend to organize concerted collective action toward reducing transportation costs, social overhead capital, education, and technological progress. The book is founded on the proposition that the process of American economic growth is

> "the evolution of a market economy where the behavior or prices of goods, services, and productive factors was the major element in any explanation of economic change. Institutions and political policies have certainly been influential. They have acted to accelerate or retard growth on many occasions in our past, primarily by affecting the behavior of the prices of goods, services, or productive factors either directly or indirectly. But they have modified rather than replaced the underlying forces of a market economy" (North, 1961a, p. vii).

In June 1961, in the context of the Alliance for Progress agreement, North was sent to Brazil by John F. Kennedy on a mission organized by the U.S. Department of State and the Brazilian Economic Institute (IBRE) of the Getulio Vargas Foundation (FGV). Invited by Eugênio Gudin, North (1961c) gave four "Lectures in Regional Economic Analysis," presented at the Vargas Foundation and published as "O Crescimento Econômico Regional" in *Revista Brasileira de Economia*. North's mission was to evaluate the industrial development plans in the Brazilian Northeast conducted by the Superintendência do Desenvolvimento do Nordeste (Sudene), created and directed by the Brazilian economist Celso Furtado. The result was North's *Analysis of the new Sudene Five Year Plan for the Development of the Northeast* (North, 1961b), a detailed critique of Sudene's First General Plan written by Furtado himself (Boianovsky and Monastério, 2018; see also Boianovsky, 2018).

On June 20, North met Furtado in Sudene's headquarters at Recife, Pernambuco. North's main critical points concentrated on the population problem faced in the Northeast regions in the context of droughts and water insecurity, recommending the migration to proximate regions that did not have water scarcity. In addition, North criticized the industrialization proposals based on Furtado's claim of low agricultural productivity in the Northeast region in comparison to the Center-South region. Along the lines of Lewis' dual-sector model, Furtado proposed that industrialization was the only way to solve the population excess (i.e., unlimited labor supply) and to develop the Northeast region.[38] In contrast, North maintained that the Brazilian Northeast lacked market extension and economies of scale, qualified labor, and natural resources for industrialization.

Nevertheless, as Mauro Boianovsky (2009) argues, there are interesting parallels between North and Furtado. Both economists struggled to understand the causes of development and underdevelopment in the New World contrasting experiences, namely, the economic success in North America and the sources of stagnation in Latin American countries. Both also stressed the pivotal role of exports in the development paths in Brazil and the United States, calling attention to the decisive role of factor endowments and initial conditions, which contributed to the nature of established colonial rules that perpetuated divergent long-run growth processes. In his classic work on *Formação Econômica do Brasil*, translated in 1963 as *The Economic Growth of Brazil*, Furtado (1959) was probably influenced by North (1955) in his analysis of the role of cotton in American growth in the nineteenth century and the genesis of divergent economic paths between the United States and Brazil. As North deepened his research on structures and social change, preoccupations already present in his mentor Knight, he arguably became closer to Furtado's structuralist approach.[39]

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[38] We should also note that Furtado's mature writings emphasized the role of emulative demand patterns of ruling classes in underdeveloped countries for obstructing widespread industrialization and perpetuating this underdeveloped condition. This point encounters parallels in North's (1959) analysis of the co-evolution of resource endowments that determines the staple commodity production function, institutions, and the role of export-led agriculture in regional economic growth. For an overview of Furtado's theory of economic development, see Boianovsky (2010).

[39] As discussed, Knight's approach can be classified as closer to Braudel's *École des Annales*. Furtado was deeply influenced by Braudel's social history and Claude Lévi-Strauss' structuralism. For a discussion on Furtado's methodological position, see Boianovsky (2015). In North's (1977a, p. 191) judgment, the "Annales School builds on bits and pieces of theory - geographical determinism, Marxism, Malthusianism; at its best, in the hands of a Braudel or a [Emmanuel] Le Roy Ladurie, it is more an art form than a scientific approach to history. [...] Although Annales scholars have made extensive use of price statistics, they are seldom schooled in economic theory, and, as a result, the implicit or explicit economic analysis is often weak or simply incorrect." Of course, this (perhaps harsh) evaluation regarding the *École des Annales* is only understandable when we contrast it with North's somewhat

## IV. AN ABORTED REVOLUTION? THE RISE AND FALL OF NEW ECONOMIC HISTORY

In an interview regarding the New Economic History uprising, North (2008, pp. 197-8) judges that "[w]hat we did then was impressive enough to be called a revolution, but the failure to go on to deal with the two major shortcomings of neoclassical economic theory applied to history have aborted the revolution." In his view, the first major shortcoming is modeling political and economic market imperfections and frictions, particularly failures relating to imperfect knowledge. Imperfect knowledge (such as measuring costs) is a paramount determinant in transaction costs. The second major shortcoming, he continues, is that "economic history is about *change through time*, and economic historians have simply not addressed that difficult but essential problem."

In the early 1960s, North was the torchbearer of New Economic History. In the event of the publication of the new and revised *Historical Statistics of the United States* by the U.S. Census, North (1963, p. 128) pays tribute to the new quantitative work on the U.S. economy produced in the 1957 EHA/NBER joint conference. "A revolution is taking place in economic history in the United States," he writes. The revolution has been carried through by "a new generation of economic historians who are both skeptical of traditional interpretations of U.S. economic history and convinced that a new economic history must be firmly grounded in sound statistical data." During this revolutionary process, many accepted truths of American economic history held sacred by historians had been destroyed in mere cursory theoretical examinations and empirical statistical analysis.

According to North (1963, p. 129), for instance, the widespread truth of the unprofitability of slavery in the antebellum South is simply inconsistent with elementary neoclassical price theory. In addition, Conrad and Meyer (1958) provided an empirical refutation of this proposition. Other myths refuted by early cliometric research are the indispensable role of the railroads in

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restricted view of the scientific approach to history. A view that, although stated in the late 1970s, seems to be too much influenced by the imported logical positivism that marked some of the rhetorical strategies of the cliometric revolution in the later 1950s and early 1960s. We could only speculate that North, as he became more and more distant from the standard view that only formal mathematical models capable of verification through direct observation are real models, would put his criticisms in a more amenable fashion from the 1980s onwards. For instance, if we accept the philosophical doctrines of logical positivism or logical empiricism, Charles Darwin's theory of evolution through natural selection could not be classified as a scientific theory.

nineteenth-century American development (Fogel, 1964) and the importance of the Civil War in accelerating U.S. industrialization (Cochran, 1961; North, 1961a). In the 1960s and 1970s, the demand by economics departments for economic historians trained under the rigors of neoclassical economic theory and econometric quantitative analysis provided the market test testimony of the cliometric revolution. As North (2008, p. 198) recollects, "[i]n the 1960s, if my students didn't have six job offers, I thought they were really doing terribly. [...] So it was an extraordinary rapid revolution, and it was a revolution, you're darned right it was a revolution."[40]

Nevertheless this sweeping scientific and professional success, the cliometric revolution had a much more difficult task in reaching positive and insightful theoretical conclusions. In North's (1963, p. 129) view, New Economic History only scratched the surface of the Smithian grand social and economic problem. One of the few positive conclusions arrived at the time is the role of cotton and interregional trade in American growth as developed by North's neoclassical staple export model. As he put it, "[t]he tools of the economist provide initial hypotheses to explore a wide range of questions posed by the economic historian, but for those concerned with the great question of the economic rise and fall of nations the fare is still thin." Two years after this initial evaluation and introspection within the New Economic History revolution, North adopted a deep critical tone toward his peers and the profession in general in an article on "The State of Economic History" (1965, p. 90). In his view, (i) "the quality of research in economic history is generally very poor" and "the economics profession must take a large share of the blame."[41] In addition, New Economic History cannot be excluded from being part of this poor-quality *status quo*. Lacking theoretical and sociological imagination, (ii) "the new economic history falls short of the mark in remedying this [quality of research] problem."

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[40] In his introductory essay in *Capitalism and the Historians* (1954), anticipating in some aspects the myth-busting tone of cliometrics, Friedrich A. Hayek (1954, p. 10) complained about the widespread myth by historians that the rise of "capitalism" or industrialization in England was associated with the worsening of workers' living standards. Indeed, original institutionalist William M. Dugger (1995, p. 457) writes that "Hayek was probably the first cliometrician." However, this interpretation is very far from what the textual evidence can provide us.

[41] North (1965, p. 87) lists five great deficiencies of (old) economic history as practiced in his days: "(1) Vast areas of economic history have not been treated at all; that is, treated in the sense that economic theory and statistics have been used to examine the past. (2) Many writings in economic history are loaded with statements which have economic implications and imply causal relationships which are not only not supported in the research but which run counter to basic economic propositions. In fact, in most such cases, the author appears to be completely unaware of these implications. (3) Even more conspicuous is the character of the evidence advanced to support propositions. In good part it consists of a mishmash of quotations and oddly assorted statistics which do not provide any support or test for the propositions developed. (4) A good deal of economic history draws broad welfare conclusions which are by no stretch of the imagination warranted from the evidence cited."

According to North (1965, p. 90), the results of the New Economic History "have been generally disappointing. Too much of it has been dull and unimaginative, and there seems to be a widespread conviction that econometric techniques, the computer, and running a few regressions can substitute for theory and imagination. Some of the new economic history written by economists is of distressingly poor quality. Some of it is so imprecise and fuzzy as to make it difficult, if not impossible, to make any model at all." Indeed, this fact is most troublesome and can be somewhat sound paradoxical since making a specified model that is potentially testable and refutable is the cliometric innovation to economic history. North (1965, p. 91) concludes that "it is my conviction that we need to sweep out the door a good deal of the old economic history, to improve the quality of the new economic history," and to strive for economic history discipline to achieve the same rigorous standard expected in other areas of economics.

In the late 1960s and early 1970s, North's latent and emerging dissatisfaction with the developments of cliometrics was gaining increasing *momentum* (cf. North, 1997b). The apotheosis of this inner reflection process is delineated in his 1973 presidential address to the Economic History Association, entitled "Beyond the New Economic History" (1974). In this address, North (1974, p. 1) invites his peers to go beyond the traditional limits imposed by neoclassical economic theory in historical research. He argues that the most significant innovation of New Economic History, i.e., the systematic use of economic theory and quantitative methods in history, is also its fundamental constraint. Therefore, although the standard neoclassical theory "has provided the incisive new insights into man's economic past," it "also serves to limit the range of inquiry" of economic historians. In this sense, he complains that his "former revolutionary compatriots show distressing signs of complacency with the new orthodoxy." As North (1977a, p. 197) writes in another place,

> "the revolutionary spirit which infused the little band of scholars who met annually in the dead of winter in the frozen wastes of Lafayette, Indiana, in the early 1960s is clearly lacking today even though the annual cliometric conferences continue (albeit in Madison, Wisconsin, in springtime). The problem is straightforward. Most of the new economic historians are still attempting to ape their colleagues."

In his presidential address, North (1974, p. 2) points to five considerable limitations of New Economic History as a *modus operandi* to historical research. First, "[t]he research has been more destructive than constructive." New Economic History had a good track record of historical myth-busting, but it did not replace the old truths with a systematic explanation of economic change. Second, the research was mostly "on specific issues or institutions, but little light has been shed on the long-run transformation of economic systems - that is, long-run economic growth." Third, "[t]here is no role for government in the analysis except as it is brought in an *ad hoc* fashion." Fourth, it does not account for the other three sources of decision-making outside the market process, i.e., the household, organizations (such as firms), and government. Neither neoclassical economic theory accounts for the different combinations throughout time of these decision-making units. Fifth, "it is curiously unteachable at the undergraduate level."[42]

As North (1974, p. 3) readily acknowledges, most or all of these limitations are intrinsic to the standard neoclassical theoretical framework. This fact is understandable when we consider that neoclassical economics "was not designed to explain long-run economic change." Indeed, neoclassical economics is primarily an individual rational choice theory within specified constraints, whereas economic history is about the secular changes in those constraints. Hence, in a general equilibrium world, an economy is characterized by the equality of all different subjective and objective marginal substitution rates, resulting in an optimum resource allocation equilibrium state. We are in the formal similarity world in which all societies must deal with the economic allocation problem imposed by scarcity. Welfare economics derived from this theory implies that economic growth should be inevitable and trivial, given certain assumptions on savings and population dynamics.

As a brief detour, one may ask how North could reconcile the *prima facie* antagonism between the individual rational choice analysis within defined constraints and his vision of economic history as necessarily encompassing secular changes in those specified constraints that shape human action through time. Therefore, although North criticized the neoclassical general equilibrium theory from the mid-1970s onwards, he still used the rational choice framework in his subsequent works (e.g., in his 1981 book on *Structure and Change*). This tension is attenuated if we understand the nature of the pure logic of choice in an individual choice

[42] Another point is that the counterfactual methodology, the greatest methodological innovation of New Economic History, has lesser accuracy the greater the potential repercussions effects of the causal variable in the test since the greater will be the general disequilibrium effects of the counterfactual proposition.

computation equilibrium and its connections with rational choice analysis and neoclassical general equilibrium theory. The rationality principle denotes that people maximize their scarce means to achieve different and conflicted ends in light of their subjective contextual evaluations and perceptions. This method is what the Austrian philosopher of science Karl R. Popper (1976) called situation analysis.

In this stage, nothing is said about whether the individual subjective interpretations of the world are true. In standard general equilibrium theory, however, neoclassical economics assumes that individuals have perfect and objective knowledge. The subjective element of situational analysis is lost because the inquiry focuses on the final state of general equilibrium. However, in the social coordination problem that every society faces, as Hayek (1937) famously clarified, there are conflicting subjective expectations about external reality. An individual action plan will necessarily need to coordinate itself with the plans of other individuals and the external world. Thus, utilizing the subjective rational choice framework is not equivalent to employing the objective utility-maximizing hypothesis or the standard general equilibrium theory. In a world of instrumental objective rationality, institutions are unnecessary.[43]

Moreover, even regarding the question that the neoclassical economic theory was designed to answer, i.e., the decentralized individual choice computation and the market static resource allocation, it provides limited answers confined to a world where the assumptions of standard general equilibrium theory apply. That is a world of complete markets with complete knowledge and perfect competition (the latter defined by perfect information, price-taking actors, and the absence of externalities). In other words, this is a world of zero transaction costs, i.e., zero costs of specifying, enforcing, and coordinating property rights and contracts among individuals. Given this state of affairs, North (1974, p. 4) writes that one radical alternative is to "throw out neoclassical theory and start all over again." However, another alternative and preferable solution is to broaden the neoclassical framework to include all those missing analytical parts for a

[43] Indeed, this is precisely the qualification that North will develop in his mature research program on the cognitive foundations of ideology, shared mental models, and beliefs post-1981 (e.g., see North, 2005). In North's (1994, p. 362) opinion, "[i]t is necessary to dismantle the [objective] rationality assumption underlying economic theory in order to approach constructively the nature of human learning." On this point, North is deeply influenced by Herbert Simon's theory of bounded rationality. As Herbert Simon (1986, pp. 210-1) stated: "If [...] we accept the proposition that both the knowledge and the computational power of the decision maker are severely limited, then we must distinguish between the real world and the actor's perception of it and reasoning about it. That is to say we must construct a theory (and test it empirically) of the process of decision. Our theory must include not only the reasoning processes but also the processes that generated the actor's subjective representation of the decision problem, his or her frame."

systematic theory of institutional structures and economic change, maintaining the basic assumption of utility-maximizing behavior and the consequent price theory analysis.

Therefore, North (1974, p. 6) suggests that the development of household economics (with particular reference to a theory of fertility and the economics of family), a theory of property rights derived from transaction cost economics, and a theory of the state (which involves public choice theory and a theory of ideology) can be amalgamated into a common extended analytical framework. In particular, transaction costs not only explain the different combinations within economic organizations, such as the decision to buy in the market or to make within the firm. Indeed, since the economic organization is a *continuum* from a purely market voluntary exchange and purely governmental coercion, transaction costs also can open "the door to an explanation of much of the institutional structure of an economic system."

North (1977a) continued his critical reevaluation of the cliometric movement, comparing it with other schools of historical research, such as the old economic history, the Marxian approach, and the *École des Annales*. As North (1978a, p. 7) points out, the great merit of cliometrics is "its attempt to develop a more scientific history. The explicit use of theoretical models and the systematic use of statistical inference in testing procedures are the most distinctive contributions of this approach." In other words, North (1977a, p. 190) writes that cliometrics "uses simple theory which can produce predictable and specific results rather than indeterminate consequences." In this sense, the "explanation entails the application of the principles of scientific explanation derived from the natural sciences."

According to North (1977a, p. 191), in plain contrast with cliometrics, the old economic history immerses itself in the detailed, context-specific historical reconstruction of the social and economic past. It is mainly concerned with the institutional structure of a society, which provides the multidimensional matrix in which individual actions are constrained and social phenomena formed. Indeed, old economic history also employs theory, as every explanation inevitably does, but "the theory is implicit, frequently internally contradictory, or at odds with basic and widely accepted economic propositions." In this sense, old economic history is not capable of producing testable specific predictions along the lines of scientific procedures derived from the natural sciences. In the same manner, North (1978a, p. 79) sustains that "the Marxist school cannot be faulted for ignoring the evolving structural aspects of economic systems. Property rights, the state, technology, and ideology have all been a part of Marxist economic history (although

typically not demography).” However, Marxian economic history also failed to specify its models and test its hypothesis. Moreover, Marxists have made little additional theoretical and quantitative advances after Marx’s seminal contributions.

In North’s (1978a, p. 80) view, the Annales school cannot be properly classified as a historiographical school in the same way as Marxists and cliometricians since it has not constructed a model. He writes that “Fernand Braudel’s [1949] masterpiece, *Le Monde Mediterranéen*, is not a model on which one can build a school. It is a work of art which, when subject to the critical scrutiny of the cliometrician, becomes a lot of brushstrokes on a canvas. [Emmanuel] Le Roy Ladurie’s *Les Paysans de Languedoc* [1966] is an enormous achievement, but because he misreads [David] Ricardo and confuses rent with profit, much of his economic analysis does not make sense.” Therefore, although Annales scholars have made significant quantitative and statistical contributions, they share their ignorance of standard neoclassical price theory and contempt for testing hypotheses with the Marxist school.

In contrast with old economic history and Marxists, North (1977a, p. 1930) maintains that neoclassical economics naturally assumes that all the institutional specified constraints involved in individual rational choices are exogenously given. However, the *raison d’être* of economic history is to study these institutional structures that frame individual maximizing behavior throughout time and that, in consequence, determines social coordination and economic performance across different societies. In other words, North argues that “[t]he essence of historical explanation is the interplay between the ongoing historically derived constraints and the choices open to the participants.” As a result, “for the economist *qua* economic historian, such an approach [i.e., neoclassical economics] can only result in sterility.” Indeed, as North (1978b, p. 963) concludes in his article on “Structure and Performance: The Task of Economic History,” with the cliometric revolution

> “[e]conomic history gained in rigor and scientific pretension, but at the expense of exploring a much more fundamental set of questions about the evolving structure of economies that underlies performance. Cliometricians have turned their backs on a long tradition stretching back from Joseph Schumpeter to Karl Marx to Adam Smith. These scholars regarded economic history as essential because it added a dimension to economics. Its purpose was to analyze the parameters held constant by the economist. If

> economics is a theory of choice subject to specified constraints, a task of economic history was to theorize about those evolving constraints."

## V. THE FIRST STEPS IN MAKING A NEW INSTITUTIONAL ECONOMICS

In 1966, Douglass North went to live in Geneva, Switzerland, for a year as a Ford Faculty Fellow. In the 1966-67 academic year, he lectured at Oxford, the London School of Economics, Essex, Paris, Caen, and Geneva. During the fellowship, North wrote his book *Growth and Welfare in the American Past: A New Economic History* (1966), planned as an introductory textbook to the cliometric research program. In this work, North used simple price theory and quantitative analysis to challenge the long-time spread views held at the time, favoring his interpretation of American economic development.

Significantly, the first chapter was entitled "Theory, Statistics, and History," Schumpeter's three combined techniques that define scientific economic analysis. As North writes, the empirical inquiry is limited only by the existence of appropriate theory and evidence.[44] However, in the same period, he decided to switch from American to European economic history. This change presented him with a great puzzle. As North (2009, p. 165) recollects,

> "You can write all American economic history using simple price theory. The US has always been a market economy to some extent, one which became more and more a market economy. So just using a simple theory of markets could tell the story of a lot of what had happened in the US alright. But Europe? How could you talk about feudalism and the manorial system with neoclassical theory? This is where I realized that we need to develop a better body of theory to confront the crucial issues. That's what got me into

[44] The contents of North's textbook changed considerably in the three editions of the book (i.e., 1966, 1974, 1983). The last edition was co-authored with Terry L. Anderson (North's former Ph.D. student) and Peter J. Hill (North, Anderson, and Hill, 1983). As Brownlow (2010, p. 309) documents, for instance, words such as institutions, property rights, and transaction costs received zero mentions in the first edition. In the third edition, in contrast, these words received 16, 45, and 6 mentions, respectively. In the first edition, North deeply emphasizes market integration, technology, and technical advances relative to institutional change.

trying to figure out and understand institutions and all that jazz that I've been doing ever since."[45]

In his early 1968 contribution to the *Festschrift* in honor of Walter Hoffman, North (1968a, p. 140) advocated "A New Economic History for Europe." He argued that the cliometric revolution that was "completely transforming the traditional discipline" in the United States was still missing in Europe "because there economic historians are trained as historians and not as economists." Therefore, North (1968a, p. 147) maintains that "European economic history is in need of fundamental restructuring." In his view, only by combining "modern economic theory and the development of new theoretical insights, as well as by the imaginative employment" of these insights, we could start to understand the formation and evolution of Western economies and civilization. "Such work can be done only by the new economic historian thoroughly trained in economic theory and statistics."

However, North (2009, p. 165) would soon find that neoclassical economic theory is wholly inappropriate in dealing with different institutional arrangements dynamics outside the existing market price coordination mechanism. Thus, in applying neoclassical economics to understand European economic developments, he "just couldn't make sense out of history." This frustrated attempt made clear in a fundamental fashion the need to go beyond New Economic History and its embodied theoretical framework. In his research on the "Sources of Productivity Changes in Ocean Shipping, 1600-1850" (1968b), North found a promising step to the importance of institutions for productivity evolution. He discovered that ocean shipping costs decreased,

[45] As North (1997a, pp. 256-7) writes: "Re-tooling turned out to change my life radically, since I quickly became convinced that the tools of neo-classical economic theory were not up to the task of explaining the kind of fundamental societal change that had characterized European economies from medieval times onward. We needed new tools, but they simply did not exist. Neoclassical theory was concerned with the operation of markets and assumed the existence of the underlying conditions that were a prerequisite to the operation of markets. It had nothing to say about how markets evolved. Moreover it was a static theory, and we needed to have a theory that was dynamic and could explain the evolution of economies through time. We needed new tools, but they simply did not exist. It was in the long search for a framework that would provide new tools of analysis that my interest and concern with the new institutional economics evolved. [...] The old institutional economics, because it failed to provide such a theoretical framework, never posed a serious alternative to neoclassical economics. Marxism was explicitly concerned with institutions, asked good questions, and had an explanation of long-run change, but there were too many flaws in the model. Making classes the unit of analysis and failing to incorporate population change as a key source of change were major short-comings. The strengths of neoclassical theory were its uncompromising focus on scarcity and, hence, competition as the key to economics, its use of the individual as the unit of analysis, and the power of the economic way of reasoning. There had to be a way of melding the strengths of these diverse approaches into a theoretical structure. That is what I and others have set out to do in the new institutional economics."

particularly in the nineteenth century, mainly due to total factor productivity gains made by organizational and institutional innovations that reduced piracy and increased round-trips per year, the size of ships, and their load factors.

Observing a maritime museum in the Netherlands, North noted anecdotally that the ships during the seventeenth to nineteenth century did not demonstrate any breakthrough technological advancement. Instead, they increasingly carried fewer armaments for protection from pirates and other attack sources. As North (1968b, p. 967) writes, "[t]he conclusion one draws is that the decline of piracy and privateering and the development of markets and international trade shared honors as primary factors in the growth of shipping efficiency over this two-and-a-half-century period." In this sense, North arrived at the surprising conclusion that technological progress did not play a decisive role in total productivity changes during the period, something that the standard neoclassical growth theory à la Solow-Swan would have predicted. Instead, his findings suggested that technical progress interacts and co-evolves with the institutional environment in co-determining transaction and production costs.[46]

According to North, technologically superior vessels such as the Dutch fluyt used in the Baltic were already available long before its modified versions could be economically, safely, and widely employed in ocean shipping. This vessel originated in the sixteenth century in the Dutch Republic and was designed to maximize cargo space and crew efficiency. In contrast with its contemporary rivals, the Dutch fluyt was not intended to be transformed into a warship. For this reason, the vessel carried twice the cargo managed by a smaller crew and was cheaper to build. The Dutch ships were traveling all along the seventeenth century in the Atlantic and the Indian Oceans. However, North maintains that these more advanced vessels could not be used predominantly in this period because of piracy, which forced ships to carry more crew members and armaments for defense. From 1814 to 1860, he estimated that the total factor productivity in ocean shipping increased at almost 10 times the rate per year compared to the annual rate in the previous two centuries. The fact that the main component for transaction cost reduction and total factor productivity increase in ocean shipping was reduced piracy led North to develop the first

[46] These conclusions were disputed by Knick Harley (1988), who argued that the decline of ocean shipping costs pre-1850 was due to American market integration into the wider European economy. After 1850, Harley maintained that the costs of constructing and operating ships declined due to changes in mechanical and metallurgical technology.

sketch of a theory of institutional innovation using the neoclassical choice-theoretic approach at the margin.

In *Institutional Change and American Economic Growth* (1971), co-authored with his student Lance Davis, North extended the neoclassical economic theory to the choice of rules based on the wealth-maximizing hypothesis and used it to illustrate the institutional innovation process in American economic growth. In the book, Davis and North (1971) aimed to construct a body of theory extending the neoclassical economic analysis to include an explanation of the formation, mutation, and decay of organizational forms in which human social interaction unfolds. Taking as given the institutional environment (the set of fundamental political, social, and legal ground rules) and some exogenous disequilibrating force, the model attempts to predict whether an institutional innovation will be established and at which economic decision unit level this new arrangement will be pushed forward by the relevant action group (purely individual, some form of voluntary cooperation, or the coercive power of government) and their timing. The action group perceives that some potential external or redistributive income can be extracted by altering the institutional structure at the margin through an arrangement innovation process. Potential external income derives from economies of scale, externalities, risk and uncertainty, and market failures such as information costs.

The primary action group innovates through a new arrangement, which can be the direct application of an institutional instrument (such as a document or device) or the creation of a secondary action group on which potential income can be captured. Davis and North (1970, 1971) formalized this process in a lagged supply investment model, where a change in demand caused by an exogenous disequilibrating force in one time period determines the lagged supply of an arrangement innovation to capture the potential rents created by the shock. Thus, the institutional innovation process is an efficient equilibrium outcome in capturing or internalizing potential external or redistributive income. The initial equilibrium is defined in the lines of general equilibrium analysis. Market prices perfectly incorporate all potential external income. The property rights structure is distributed in such a form that prevails an optimum allocation of scarce resources.

Given the initial equilibrium, potential income from institutional innovation emerges when exogenous shocks create an externality, a restructuring of risks, a shift in transaction costs, or an application of a new technology subject to increasing returns. Costs of operating the *status quo*

institutions may also change due to some technological shock (in particular, in military technology) or due to a change in the relative factorial prices. Finally, legal and political shocks can occur in the basic economic environment (such as a drastic change in property rights distribution or a political revolution). The primary action group choice of arrangement innovation is defined as the maximization of the discounted stream of net future income of different arrangement alternatives. Formally, Davis and North (1970, p. 140) define the action group's formulation as:

$$V = -C_o + \frac{[R_1-(Cr_1)]}{(1+r)} + \frac{[R_2-(Cr_2+C_s)]}{(1+r)^2} + \ldots + \frac{[R_n-(Cr_n+C_s)]}{(1+r)^n} \quad (1)$$

Where $V$ is the discounted present value of the arrangement innovation, $C_o$ is the cost of effecting the new arrangement, $R_n$ is the expected returns that the action group estimate will flow from the new arrangement in year n, $C_r$ is the expected costs of operating the new arrangement in year n, and $C_s$ "is the estimate of the costs of getting stuck with a decision that the members of the action group do not like."

Using this innovation model, Davis and North (1971) argued that a significant part of American economic growth occurred by action groups pursuing profit opportunities by changing and inventing new institutional and organizational arrangements. The authors provide a myriad of examples (such as the evolution of capital markets, railroads, public goods such as canals, general incorporation laws, education, and regulation for the manufacturing sector) in which complementary institutional innovation was indispensable to productivity evolution in the United States. Therefore, for instance, Davis and North (1970, p. 144) argued that "the innovation of the corporation with its unlimited life and limited liability lifts the restrictions on obtaining capital and therefore allows its innovators to reap the profits inherent in the economies of scale."

Moreover, the model also explains the changing public-private economic mix in American economic history as the channel to capture external and redistribution profit opportunities. For example, the entrance of government in canal investment during the 1830s was a rational decision given the absence of developed capital markets. In the same manner, the rise of government in the twentieth century results from the relative increase in profit opportunities

through income redistribution and divergences between private and social costs associated with urban development, externalities, and public goods.[47] Therefore, with the theoretical model that Davis and North (1971, pp. 119-120) built, they argued that

> "the formation (and mutation and decay) of these organizational forms can now be an integral part of the economic analysis rather than a descriptive addition to the analysis. Moreover, since a great many were realizable without substantial redistribution of income, their formation is at least in principle predictable from the model. Perhaps even more significant than the ability to integrate economic analyses and institutional formation is the implication of this theoretical model for the study of productivity increase. Economic historians have focused on technological change as the source of growth but the development of institutional arrangements from the above-mentioned sources are a major historical source of the improvement in the efficiency of product and factor markets. The development of more efficient economic organization is surely as important a part of the growth of the Western World as is the development of technology, and it is time it received equal attention. The few cases of which I am aware that have attempted to measure productivity change attributable to improving economic organization certainly support this contention."

One of the main weaknesses of the Davis-North model is the tautological trap of rationalizing every arrangement innovation as an equilibrium process of social welfare maximization, following Demsetz's (1967) theory of the emergence of property rights. Therefore, institutions are seen as an efficient equilibrium result of maximizing rational agents. In a first approximation, it may be reasonable to expect that societies will tend to devise institutional forms that reduce transaction costs so that the property rights patterns are the most efficient to encourage the division of labor and productive exchange. However, the political and ideological forces that shape informal and formal institutions are much more complex processes. Davis was not an ideal collaborator for North to develop his novel ideas. As North (2009, p. 166) noted in an interview,

[47] It is important to note that the expected return of institutional innovation depends on the general subjective perception of the costs and benefits of different organizational alternatives. The complementary institutional evolution is necessarily linked with the evolution of the dominant political and social views.

"Lance was a terrible person to work with. He was impossible, obstreperous, ornery, and difficult." So he started to work with the young economic historian Robert P. Thomas.

In "An Economic Theory of the Growth of the Western World" (1970), North and Thomas applied the theory of institutional innovation outlined in Davis and North (1970, 1971) to explain European economic history and the Great Enrichment process that occurred in Western Europe since the nineteenth century. One year later, North and Thomas published "The Rise and Fall of the Manorial System: A Theoretical Model" (1971) using the transaction costs concept to describe the manorial system. This previous research formed the core of one of North's most important books, co-authored with Thomas, *The Rise of the Western World: A New Economic History* (1973). As North and Thomas (1973, p. vii) write in the preface, the book was intended to be revolutionary in the sense that they developed a comprehensive analytical framework "consistent with and complementary to standard neoclassical theory" to explain the rise of the Western World. They argued that the immense wealth accumulation and astonishing rising living standards experienced in Western Europe occurred due to institutional arrangements that compatibilized the expected private and social returns, generating the right incentives for efficient economic coordination, capital accumulation, and technological progress.

According to North and Thomas (1973), the different transaction modes in European economic history can be analyzed within the efficient institutional change framework. They argued that the manorial system in the Middle Ages was a rational economic organization considering the prevailing conditions since the decline of the Carolingian Empire. In particular, when considering transaction costs, population dynamics, technology, and relative factorial prices. In the absence of product and factor markets, the serfdom institution can be understood as a contractual relationship (not without coercion) between the feudal lord and his dependents. The feudal lord exchanges protection against violence within the fortified manor house in return for obligatory labor-time services (such as the *corvée*) or in-kind products cultivated in the property. Changes in population dynamics and technology reverberate in changing relative factorial prices, creating profit opportunities for institutional innovation.

In the tenth century, with a growing population, extensive land cultivation, and increasing trade and urban development, land became relatively scarce vis-a-vis labor. Thus, the amount of forced labor by serfs due to the landlords increased, i.e., wages fell and rents increased. In the mid-fourteenth century, with the bubonic plague pandemic, the relative scarcity between labor

and land changed drastically. At least one-third of Europe's population was killed between 1347 and 1352. The black plague made labor a relatively scarce factor in relation to land. In this scenario, the amount of forced labor obligations by serfs significantly diminished. These relative price changes induced efficient institutional changes that would eventually end serfdom and manorial institutions in Western Europe - but also a return to the institution of serfdom and slavery in Eastern Europe. In this context, lords were forced to change the contractual relationship with serfs offering new organizational tenancy and leasing arrangements so that in some areas of Western Europe serfs were liberated.[48]

In the sixteenth century, landlords in the Netherlands started to encourage trade fairs in their regions, providing judicial courts to secure, define, and enforce property rights, promoting commercial exchange and productive specialization. In the next century, England incorporated some Dutch institutions but also developed its domestic institutional arrangements to promote the alignment of private and social returns. With the Glorious Revolution in 1688, the parliament shackled the Leviathan's absolute power and became the main executive body, establishing the basis for the rule of law and non-discretionary fiscal administration. Property rights were secured and independent courts (matured with the Act of Settlement of 1701) judged disputes based on common law. In addition, the Statute of the Monopolies of 1624 created a patent law system to secure temporary extraordinary private gains for technological innovation and the banking and credit system was developed (see also North and Weingast, 1988; Milgrom, North, and Weingast, 1990).

Nevertheless, North emphasizes that institutional change carries two great problems that obstruct the capture of profit opportunities toward an optimal institutional structure or a Pareto-improving equilibrium. First, institutional innovation is a non-excludable and non-rivalrous public good such that there is a free-riding problem. Individual members can

[48] In his "A Plea for Theory in Economic History" (1929, p. 533), Eli Heckscher had already pointed out that without economic theory it is very difficult if not impossible to offer an explanation and understand these and other economic processes. Regarding interference within prices and wages, for instance, it is necessary to find out how the system would have reached a different equilibrium position if the interference was absent. Hence, Heckscher argues, regarding "the measures intended to prevent the workers from profiting from the Great Plague about the middle of the fourteenth-century, how were farmers prevented from competing for the supply of labour, which had diminished as a consequence of the Plague? Before this is discussed, no true explanation has been given. Or take the parallel case of 'customary rents'. If landowners really were, or felt, bound not to increase rents even when the demand for leases exceeded the supply at these rents, in what way was the choice effected between those wanting to take the same lease and of which only one could get it? To state that legislation or custom has been effective in cases like these is really saying nothing; for the economic problem must still be solved."

benefit from the innovation without paying their marginal share of implementation costs. Second, there are the costs of measuring, defining, and enforcing property rights and contracts. Transaction costs hamper the full private appropriation of social benefits and costs. Moreover, transaction costs (in conjunction with production costs) shape the most efficient organizational structure for the scarce economic resources of a society in a determined historical environment.

In general, *The Rise of the Western World* (1973) generated some profound criticism of its embodied basic approach. In his book review, for instance, Herman van der Wee (1975) criticizes the reductionist approach advanced in North and Thomas's analysis. The organic institutional structure encompassing social, economic, and cultural ramifications cannot be reduced to simple property rights analysis and relative price changes. Along the same lines, Stefano Fenoaltea (1975, p. 387) attacks North and Thomas's (1971, 1973) "ingenious interpretation" regarding serfdom in Western Europe and the manorial organization. He disagrees with the basic view that serfdom was essentially characterized by a contractual exchange agreement where labor services were provided in exchange for protection from violence.

Furthermore, Fenoaltea (1975, p. 408) disputes that the classic manorial organization was an efficient equilibrium outcome that minimized transaction costs given relative factorial prices, population, and technology. In his view, North and Thomas misspecified the feasible counterfactual alternatives such as indirect barter and market exchange. Moreover, they "misrank the alternatives they consider (as even rents in kind appear superior to labor dues)." In addition, on a methodological ground, Alexander Field (1981) argues that the general equilibrium model necessarily defines some parameters as exogenous, e.g., endowments, technologies, preferences, and institutions. In the neoclassical efficient institutional change model, all these exogenous parameters are endogenized within the model. However, for the neoclassical model to be consistent it must define some elements as parametric. The model cannot explain all the elements all at once.

Perhaps the main critique of the neoclassical institutional innovation model that North developed with his co-authors in the 1970s is the inexorable vice of rationalizing every arrangement innovation as an efficient (i.e., with less total costs, including transaction costs) equilibrium process of social welfare maximization. When applied to past societies, each one embedded in multifaceted institutional structures, the efficiency criterion appears as if there were an omniscient central planner intended to maximize social welfare, an approach reminiscent of

the standard neoclassical general equilibrium theory (e.g., see Field, 1981, p. 185). Intimately connected with this point is the view that institutions and organizations are mainly determined by the demand side of the contractual agents, ignoring the institutional stickiness present in real economies due to conflicting beliefs, opportunism, and free-riding problems. Instead, the supply of institutions is better defined as the provision of non-excludable and non-rivalrous public goods. Thus, in the 1970s, the neoclassical institutional innovation model ignored the rigid and complex supply function of institutional arrangements.

Moreover, this view contributed to the forceful criticism of ahistoricism in North's account of economic history. This criticism can be segmented into three parts, (i) the objective rational choice model, (ii) methodological individualism, and (iii) the inclination to universalism (see Zouboulakis, 2005). These critiques and the insufficient theoretical and empirical explanatory power of the neoclassical institutional innovation model in addressing the fundamental Smithian social coordination problem propelled North to reject some foundational behavioral assumptions of neoclassical economic theory and, in this process, innovating in analytical terms his theory of why some nations are rich and others poor. As it is well known, standard neoclassical economic theory assumes that individuals are perfectly informed and have an objective knowledge of the real world. These behavioral assumptions left no space for institutions in theoretical inquiry. As discussed below, North gradually changed his views on the objective rationality postulate, especially after 1981. As North (1993, p. 16) writes, "in the world of instrumental rationality institutions are unnecessary, ideas and ideologies don't matter, and efficient markets characterize economies."

Regarding methodological individualism, the critique is that focusing on individual action minimizes the embeddedness of individuals in their socially determined context. However, methodological individualism is not equivalent to saying that the human agent is isolated and self-determined - although this characterization is valid in the case of general equilibrium theory. On the contrary, as North will emphasize in his mature work, institutions shape the contours of human decisions and social interactions, molding individual preferences and the subjective lens agents employ in their utility-maximizing efforts. Thus, individual preferences that structure the subjective rational choice are endogenously determined by the social context, in particular, by the shared mental models. Individuals are institutionally constrained in their actions by social beliefs, culture, norms and customs, and formal rules. On the other hand, institutional change

occurs by the individual entrepreneurs according to their beliefs and embodied in the incentives framework they are inserted. In this sense, individuals are both constructive within and constructed through the wider society.

On the matter of universalism, the critique is that evaluating the efficiency of historical institutions in completely different social, political, and economic institutional contexts, as if individuals presented the same economic behavior, is "taking history out of history" (Milonakis and Fine, 2004, p. 19). Indeed, this is the so-called economicist fallacy and the essence of the Karl Polanyi challenge, discussed in the next section. In this connection, it is interesting to note that North (1968c, p. 468) stressed the dangers of applying economic models to past societies. In his view, "application of these models to given historical situations requires the specification of the particular functional forms, parameters, or changes in parameters which may not be known to the economic historian."

Nevertheless, critics argued that North failed to precisely address this problem of historical specificity in his account of the rise of Western civilization. For instance, Brian R. Binger and Elizabeth Hoffman (1989) argue that, since an institution is analogous to a public good, this efficient equilibrium-oriented view of the origin and persistence of institutions ignores that an equilibrium outcome in a repeated coordination game is not necessarily socially efficient. An institution can arise and persist because, even though all individuals would benefit from an arrangement change, no individual would benefit from a unilateral change. In repeated games with multiple possible strategies, multiple inefficient equilibria possibilities exist.

Without a detailed historical specificity, developing a predictive theory of social institutions based on *ex post* rationalization can be very dangerous. In Binger and Hoffman's (1989, p. 78) opinion, "there is a serious problem of circularity when such reasoning is applied to analyses of the origins of institutions in history. Since historical agents did not keep records of relevant transaction costs, we can only infer them. But, when we do so, we miss the fact that our models are not fully specified." We cannot develop a general theory of the emergence of efficient social institutions from sets of initial conditions without a detailed study of the historical and social environment. In this context, Binger and Hoffman (1989) illustrate this point with the historical debate of the origin, persistence, and change of the open field system in Europe.

## VI. THE CHALLENGE OF KARL POLANYI

“Karl Polanyi’s challenge is straightforward,” North wrote in his 1977 article “Markets and Other Allocation System in History: The Challenge of Karl Polanyi” (1977b). The challenge is that, according to Polanyi (1944), “markets have only dominated resource allocation for a brief span in history centering on the nineteenth-century Western World. Before that time - and increasingly in the twentieth century - other allocative systems have characterized economic organization and these systems are not grounded in economizing behavior” (North, 1977b, p. 703). For most of human recorded history, Polanyi argued, the utility-maximizing assumption that is the core of neoclassical economic theory (and in some form of Marxism, synthesized in the cash nexus) was not present in past societies.

The economicist fallacy consists in looking at history through the lens of an economic theory based on a nineteenth-century phenomenon. Only in the nineteenth century did impersonal market exchange expand as a significant allocation procedure. Polanyi (1944) argues that reciprocity and redistribution embedded in a cage of customs, traditions, and norms constituted the most dominant allocation procedure in ancient societies. These transaction modes are mainly determined by social and cultural factors, not by individual rational economic calculation based on utility-maximizing. In this context, a choice theoretic approach to understanding social phenomena is wholly inappropriate in a world that rules out any individual voluntary choice by a rigid cage of cultural norms and tribal habits.

Reciprocity is grounded in sexual and genetic forms of social organization, such as family and kinship. It involves obligatory gift-giving between family and kin relations. Redistribution works based on a community under the command of a common political and/or religious authority in a determined territory. It involves an obligatory payment system to the political authority that uses its resources to provide some form of public good and social safety net. Other types of transaction modes are administered trade, gift trade, special purpose money, and ports of trade. Therefore, given that economic theory is based on the utility-maximizing postulate and is confined to the analysis of impersonal market exchange, Polanyi contended that “the tools of the economist were not only irrelevant to an understanding of the ancient world, but were increasingly less useful to explain the evolving economies of the twentieth century as well” (North, 1977b, p. 706).

According to North (1977b, p. 704), since "one cannot directly test behavioral postulates," such as the utility-maximizing hypothesis, "the proof of the pudding is in the eating. The increasing popularity of the new economic history suggests that the tools of economics provided gourmet fare." In North's opinion, Polanyi's arguments on institutional and organizational analysis contain many flaws, such as his highly selective historical evidence and the clear understating of markets throughout history. In his review of Polanyi's book *The Livelihood of Man* (1977) to the *Business History Review*, North (1978c, p. 399) writes that "[i]t is easy to criticize Polanyi. He never understood neo-classical theory; and even more important, much of his analysis is perfectly compatible with recent developments in transaction cost theory. The self-regulating market was no more a viable form of organization in the early Athenian grain trade than it is in the world oil market today and for quite similar reasons, but we do not argue that Saudi Arabia or Exxon are not interested in wealth maximization. The organizational forms described by Polanyi make good sense in the context of the transaction costs of the time."

Moreover, North (1978c, p. 399) sustains that Polanyi has "no explicit hypothesis about the state" and "no dynamic source of change that alters reciprocal and redistributive societies" is provided in the book. Nevertheless, North (1977b, p. 707) maintains that the only way to meet Polanyi's challenge is to develop a new alternative theoretical framework "that can explain past and present institutional structures and is amenable to testing." He agrees with Polanyi that all societies have many elements of different transaction modes besides the price-making impersonal markets, such as reciprocity and redistribution. The fundamental question is that, in the past and present, institutional arrangements that are substitutes for market coordination still dominate exchange, such as families, firms, guilds, manors, and the government. Thus, North offers an economizing explanation of these various non-market transaction modes and decision-making units grounded in transaction cost analysis.

Incorporating all the costs underlying the process of exchange in addition to the production costs, North argues that the economic historian can begin to explain the institutional structure developed by societies in an effort to capture the mutual exchange gains of social cooperation and productive specialization. If the costs of measuring, delineating, and enforcing property rights exceed the benefits, price-making markets for goods and services will not be formed. Other types of non-price coordination mechanisms will emerge as a response to potential mutually beneficial exchanges. As may be evident, transaction costs in the human past were

enormous due to the widespread violence threats. The fundamental violence problem propelled different social and cultural forms of ensuring relative peaceful cooperation through reciprocal and redistributive transaction modes based on kinship, family, status, and hierarchy.

In this sense, analyzing Polanyi's classic example of the Kula trade of the Trobriand Islanders, North (1977b, p. 713) concludes that "reciprocity societies can be considered as a least-cost trading solution where no system of enforcing the terms of exchange between trading units exists." Polanyi understands these social relations as essentially determined by cultural, social, and psychological factors which are naturally non-economic forces. On the other hand, North (1977b, p. 715) maintains that these social arrangements and traditional customs in ancient societies (as the customs of the manor) are "consistent with an explanation that they evolve as ways to reduce transaction costs." Although there is no way to directly test the transaction costs hypothesis, North argues that "changes at the margin in transaction costs should allow us to develop refutable explanations." The transaction cost framework can explain changes in the decision-making units' mix of the system throughout time. It is something that Polanyi's historical account cannot do since it is a static view of the established cultures, social arrangements, and economic systems.

In this context, North (1984a) argued that with the increasing expansion of impersonal market exchange and the division of labor, more and more economic resources would have to be devoted to deal with the transaction costs associated with defining, measuring, and enforcing property rights and contracts since the gains from opportunism would increase. Thus, for instance, North and Wallis (1987) estimated that the U.S. transaction sector had grown from 25 percent of GNP in 1870 to 45 percent of GNP in 1970. The government, primarily concerned with transacting, grew immensely in scale and scope - from 1 million to 12.5 million workers between 1900 and 1970. In addition, North (e.g., 1978b, 1984b, 1985) documents how increasing productive specialization within technological advances changed the demand for and supply of government goods and services in the United States.

## VII. "THE BEST BOOK I EVER WROTE": *STRUCTURE AND CHANGE IN ECONOMIC HISTORY* (1981)

In the early 1970s, North and Thomas (1973) argued that the creation and enforcement of property rights that aligned expected private and social returns was the key to technological progress and economic growth. In the neoclassical institutional innovation model that structures this book, early advanced by North and Davis (1970, 1971), institutions are designed to capture mutually exchanged gains and sustain social cooperation and organizational competition within the market price coordination process. Therefore, institutional and organizational analysis is considered an efficient equilibrium outcome of maximizing individuals and action groups. This efficient equilibrium result is true independent of how the word efficiency is defined.

Indeed, according to the standard neoclassical general equilibrium theory with zero transaction costs, perfect knowledge, and given reasonable hypotheses on population dynamics and aggregate savings, economic growth and efficient resource allocation should be a trivial common fact of the ordinary business of life. However, human history shows that economic stagnation and social decline were until very recently the universal norm and not the exception. This universal empirical fact presents a major puzzle for the efficient institutional change model and the neoclassical theoretical apparatus embodied in its approach. If institutions are created purely to capture mutually beneficial exchange gains and enhance social coordination and productive specialization under the division of labor, how can we explain long-run poor economic performance?

In 1960, North became a Professor of Economics at the University of Washington, Seattle. He would retain this position until 1983 when he moved to Washington University in St. Louis to become Henry R. Luce Professor of Law and Liberty. From 1967 to 1979, North served as the chairman of the Department of Economics at the University of Washington. During this period, Yoram Barzel and Steven N. S. Cheung became a major joint force in introducing and advancing transaction cost economics within the department. Both theorists had been students of Ronald Coase at the University of Chicago, with Barzel completing his Ph.D. in Economics in 1961 and Cheung pursuing a postdoctoral fellowship from 1967 to 1969 - when he moved to Washington. Both authors emphasized the importance of the measurement problem in connection with transaction costs, i.e., the quantification of information in transactions and contractual arrangements. As North (1997a, p. 260) recognizes, he “learned a great deal from both of them [Cheung and Barzel], and their influence is apparent in my next [North, 1981] book.”

In the late 1970s, North tried to address the failures of the cliometric approach to answer the Smithian Grand Question and to confront Polayni's challenge to explain the different historical transaction modes. The final product of this intellectual effort of theoretical construction is his famous *tour de force* book *Structure and Change in Economic History* (1981), mainly written in 1980. North (2009, p. 169) considers this work "the best book I ever wrote," being "very fond of it." In another place, North (2008, p. 207) reflects that if he had to pick one book "that I think most completely and effectively put it all together at one moment in this evolutionary process [of his thinking], it would be *Structure and Change in Economic History*." He justifies this choice because the second part of the book "had enough illustrations of the implications for history, so I thought it turned out better," even though the theory developed in the first part is admittedly, in a retrospective view, "very incomplete."

According to North (1981, p. 7), "explaining economic performance in history requires a theory of demographic change, a theory of the growth of the stock of knowledge and a theory of institutions, in order to fill the gaps of neoclassical theory." In other words, we need a theory capable of internalizing all the exogenous constraints in the choice computation neoclassical economic theory. To achieve this purpose, he draws upon the then-existing literature on demographic change, discussing the growth of the stock of knowledge "in the context of the changing structure of incentives incorporated in institutions." Thus, this allows him to primarily focus on building a theory of institutions that can cope with established empirical historical facts.

In the process of manufacturing a Grand Theory that can explain institutional change and long-run economic growth, North amalgamates in a neoclassical-extended analytical framework three fundamental building blocks. First, a theory of property rights that constitutes individual and action group self-interested incentives embodied in the economic structure. Second, a simple neoclassical theory of the state which specifies and enforces these property rights. Third, a theory of ideology that explains how different subjective perceptions frame individuals' maximizing reactions to changes in the objective environment. With these building blocks, he argues that it is possible to formulate a theory that is capable of integrating the main factors that compose the structure of an economy and that determine economic change and performance, namely, the social, political, and economic institutions, technology, demography, and ideology.

Furthermore, this analytical framework includes other sources of decision-making present in all human societies and outside the domains of neoclassical economics focused on the price

coordination mechanism embodied in the market exchange process. These decision-making units are the household (intrinsically connected with demography), voluntary economic organizations such as firms, and the government. All these decision-making elements are structured and unfold in an environment in which the price coordination mechanism is nonexistent. In this context, in addition to the market exchanges, these four *loci* of decision-making are prone to persistent and chronic discoordination processes due to transaction costs, free riding, and costly information in conjunction with individuals' subjective interpretation of reality. Interpretations that, when socially shared, create an ideology.

A representative case of his treatment of the growth of knowledge framed by the structure of individual incentives is that technological advance crucially entails institutional arrangements that delineate effective property rights in innovations, such as creating legally temporary rents in order to elevate the innovation expected private return close enough to the social return. Thus, in this way, it provides incentives for technical progress and economic growth. In principle, this rationale serves as the foundation for intellectual property rights and the patent system. Indeed, in North's (1981, p. 164) opinion, the "failure to develop systematic property rights in innovation up until fairly modern times was a major source of the slow pace of technological change."

In chapter III of *Structure and Change*, North develops perhaps the main component of his new political economy analytical framework, "A Neoclassical Theory of the State." In a simple tribal order, customs, traditions, habits, and informal rules are sufficient to specify and enforce personal exchange within a consensus-shared ideology. However, in a world of increasing impersonal market exchanges under the productive division of labor and knowledge, a third-party organization must emerge to specify property rights and enforce contractual arrangements. The state intrinsically has a comparative advantage in exercising violence. In particular, the state has the function of giving predictability in impersonal and non-repeating dealings, guaranteeing that expected outcomes agreed upon in written, verbal, and implicit contracts will be enforced.

In North's (1981, p. 17) perspective, a "theory of the state is essential because it is the state that specifies the property rights structure. Ultimately it is the state that is responsible for the efficiency of the property rights structure, which causes growth or stagnation or economic decline." The state is a collective-action entity that provides elementary public goods and

services (such as protection, the formal rules that define and enforce property rights, and the political institutions that determine the social choice procedures) in exchange for revenue.

Influenced by the public choice literature that applied standard economic theory to non-market political decision-making advanced by Anthony Downs (1957), James M. Buchanan and Gordon Tullock (1962), and Mancur Olson (1965), North (1981, p. 24) sees the state as a utility-maximizing ruler who attempts to maximize his own benefits (revenues) subject to the competitive constraint of losing his position as ruler and a transaction cost constraint of measuring and collecting revenue since efficient rules can be more costly to enforce in terms of tax collection.[49]

> "The basic services that the state provides are the underlying rules of the game. Whether evolving as a body of unwritten customs (as in the feudal manor) or as a written constitution, they have two objectives: one, to specify the fundamental rules of competition and cooperation which will provide a structure of property rights (that is, specify the ownership structure in both factor and product markets) for maximizing the rents accruing to the ruler; two, within the framework of the first objective, to reduce transaction costs in order to foster maximum output of the society and, therefore, increase tax revenues accruing to the state."

In this context, there is a fundamental divergence between the set of basic rules, institutions, and property rights structure that maximizes the ruler's private revenues and the one that maximizes the aggregate social output. The introduction of the theory of the state, in conjunction with his theory of ideology, marked the departure by North of the naive view that institutions were an efficient social equilibrium outcome of maximizing agents. In this case, individuals are still trying to maximize their utility but only in the subjective rational action sense. Moreover, the strategic interplay of utility-maximizing agents, in particular the complex interaction between the ruler and its citizens, does not produce a socially efficient institutional and property rights structure. Thus, the result is an inefficient resource allocation and stagnant economic growth.

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[49] North (1990b) generalized this transaction cost argument for politics, arguing that political markets are inherently less efficient than economic markets due to the higher costs of measuring and enforcing agreements.

The discoordination processes of the four decision-making *loci* explain how inefficient and rent-seeking political and economic institutions would tend to exist and be perpetuated. Indeed, as a general case, it is rational for the ruler to produce an inefficient property rights structure to maximize his benefits. Nevertheless, if the ruler attempts to raise by all means its revenue, it will disincentive productive activities and market exchange, thus reducing total output and future income. Moreover, it will raise the return of constituents to invest in overthrowing the ruler and seek foreign or internal substitutes to take political power.

With greater foreign competition and internal substitutes, the greater bargaining power of the constituents can precipitate a change in the implicit contractual agreement. This re-contractual effort will aim to reduce transaction costs and appropriate the larger share of resultant incremental income. State rivalry and rulers' competition are determined by many factors, ranging from geography (e.g., if the state is geographically insulated such as Britain it is more difficult to execute a foreign invasion), demography (e.g., increasing population reduces the provision costs of protection since defense is both a non-excludable and non-rivalrous public good), and military technology.

According to North (1981, ch. 10), military technology influences the property rights distribution of coercive power or violence potential. Therefore, the military technology of the heavily armored knight and the medieval fortified castle led to a property rights distribution of coercive power that favored the institutionalization of feudalism. With a change in military technology, exemplified by the development of the pike, longbow, and gunpowder, the property rights distribution of potential violence changed, paving the way to the end of manorial political institutions. Indeed, the Marxist political scientist Margaret Levi and Douglass North (1982) develops this argument by making a case for a property-rights theory of exploitation based on the access and distribution of the means of potential violence, which determines the bargaining power in the political decision-making process.

In consequence, North (1981, p. 18) writes that "the property rights which emerge are a result of an ongoing tension between the desires of the rulers of the state, on the one hand, and the efforts of the parties to exchange to reduce transaction costs, on the other. This simple dichotomy actually is anything but simple, since the parties to an exchange will devote resources to influencing the political decision-makers to alter the rules." He also argues that for any institutional matrix to be functional, there must be a moral value system, an ideology, or what

Arthur T. Denzau and Douglass North (1994) called shared mental models, which gives the *de jure* rules a *de facto* counterpart. Any institutional political system carries a free-riding problem for concerted collective action, so the costs of social conformity and the legitimacy of formal rules will depend on informal norms and values. Alterations in ideology change the free-riding costs to invest in collective and group action to influence political and social decisions.

In the second part of the book, North applies his analytical framework to crucially reinterpret economic history from the origins of agriculture ten thousand years ago to the twentieth century. Starting with the first economic revolution, he analyzes in eight chapters the Ancient World, the rise and decline of feudalism, the early formation of Europe, the Industrial Revolution, the second economic revolution, and the American economic growth experience. In particular, as illustrative of his political economy model, North (1981, pp. 156-7) contrasts the foundations of the political and economic experience during the sixteenth until the eighteenth century in early modern Europe.

In this period, in stagnant France and declining Spain, the desperate need for revenue to finance a large rent-seeking bureaucracy dependent on the crown and war campaigns led to the undermining of property rights, market competition, and technological change. In its most famous example, Colbertism in France propelled the sale of market monopolies to guilds as a systematic revenue method. In contrast, in the prosperous Netherlands and rising England, the political power of the merchant elites implied an institutional architecture that established secured property rights, widespread market competition, and induced technical progress and innovation. In England, as North (1981, pp. 156-7) summarizes, "little reason existed to concentrate authority in the crown over property rights and taxation [...]. The rise of Parliament caused the nature of English property rights to diverge from the Continental pattern. The power to grant property rights increasingly fell to a group whose own interests were best served by private property and elimination of crown monopolies."

In contrast with his 1973 co-authored book, North's *Structure and Change in Economic History* (1981) was a much more ambitious, revolutionary, and groundbreaking work. It marked the beginning of a period of active theoretical building and innovation, enlarging the scale and scope of neoclassical economic theory. Perhaps because of these bold and original intentions aimed to explain economic growth and structural change, it was widely well-received and acclaimed with

celebrated reviews by all intellectual parties (e.g., Goldstone, 1982; Rostow, 1982; Galenson, 1983; Millward, 1983; Tullock, 1983). Until recently, it was his most cited work.

In Walt W. Rostow's (1982, p. 300) review, he writes that "North's effort to link economic and political change and to break out of the confines of neoclassical analysis, without abandoning its real but limited virtues, is right and is a central task of social science. But I do not believe his method will do the job. Its failures all stem from the same source: his lack of a reasonably coherent view of the individual human being." Hence, in Rostow's opinion, "North is striving towards a general social science by the method of the pre-Copernican astronomers; i.e., by adding spheres to the Ptolemaic (neoclassical) system to account for the observed phenomena it did not explain."

By his turn, David W. Galenson (1983, p. 190) notes that "the more important and lasting contribution of the book will be through the work on long-run change that it will bring forth, by those who would contradict North as well as by those who would support him." Along the same lines, Gordon Tullock (1983, p. 190) predicts the emergence of a major new industry of inquiry correcting and, in particular, expanding and making further progress along the foundations laid out by North. As Frederic L. Pryor (1982, p. 989) put it in a more mixed review of the book, whether one accepts North's (1981) "explanations of particular historical events or not, we must still deal with the questions he has raised. And this is, of course, the real purpose of the book."

## VIII. EPILOGUE: TOWARD TO A NEW INSTITUTIONAL SOCIAL SCIENCE

Douglass C. North's intellectual journey derives from the search for a Grand Theory as a response to the Smithian social coordination problem. What are the nature and causes of the wealth of nations? We can trace this objective as clearly stated in his mind as a young undergraduate Marxist student in the early 1940s. Furthermore, it was why North chose economic history as his main field of inquiry and specialization in his Ph.D. dissertation under the supervision of Melvin Moses Knight at Berkeley. In his first major article dealing with location theory and regional economic growth, North (1955) was deeply influenced by his mentor Knight. In his effort to understand regional economic development, North tried to ground in a more rigorous theoretical framework the underlying processes of economic change.

As a result, North incorporated Knight's concerns with the fundamental scarcity problem and the dynamic social responses to it in the long run, combined with the importance of initial endowments and the ecology of place, to construct a neoclassical model of regional economic growth grounded in staple export-led growth, interregional trade, and market integration. In the mid-1950s, he delineated the building blocks of the staple export-led growth model *en route* to a reinterpretation of early American economic history. These conceptual blocks are Adam Smith's (1776) analytical vision that market coordination and productive specialization drive economic growth, Harold Innis' (1920) staple hypothesis, and Guy Callender's (1902) classic three-region model. In the subsequent years, North refined his staple export-led growth model and his reinterpretation of American antebellum economic growth.

In the late 1950s, North (1959) extended his model according to the natural endowments of the region (at any given level of technology), the character of the export industry, and changes in technology and transportation costs. North was particularly influenced by Robert Baldwin's (1956) discussion on the nature of the export production function. In the same period, he became the greatest theorist and one of the leading exponents of the cliometric revolution in the United States. As a result of the 1957 pivotal EHA/NBER joint conference, North (1960a) published his major quantitative work on the nineteenth-century U.S. balance of payments. The conjunction of all these previous theoretical and quantitative developments culminated in North's profound historical reinterpretation of American economic growth in the antebellum period in his famous and acclaimed first book on *The Economic Growth of the United States, 1790-1860* (1961a).

In 1966, North went to Europe as a Ford Faculty Fellow. With the publication of his *Growth and Welfare in the American Past: A New Economic History* (1966), he decided to change from American to European economic history. However, he soon realized that it was impossible to utilize the standard neoclassical equilibrium analysis to account for European multidimensional institutional arrangements and drastic social change since the Medieval times. Neoclassical economics assumed the existence of the underlying institutional conditions that were a prerequisite of the market coordination mechanism. Moreover, it was a static allocation theory that could not explain how these same underlying conditions of market exchange could come into existence.

In his account of the "Sources of Productivity Changes in Ocean Shipping, 1600-1850" (1968b), North concluded that ocean shipping costs decreased, particularly in the nineteenth

century, mainly due to organizational and institutional innovations that reduced piracy and not technological advancements *per se*. It was the step that North needed to start to develop a theory of institutional innovation using the neoclassical choice-theoretic approach at the margin. In *Institutional Change and American Economic Growth* (1971) and *The Rise of the Western World: A New Economic History* (1973), North and his co-authors adopted what became known as a naive theory of institutions and property rights based on Harold Demsetz (1967). North and his co-authors argued that the wealth of nations is essentially a path-dependent process of institutional building that minimizes the divergence of private and social returns. Implicit in this stage is the notion that institutions and the property rights structure are socially efficient.

In the mid-1960s and early 1970s, the success of New Economic History in myth-busting disseminated historical views was not accompanied by reaching positive theoretical conclusions. Cliometrics could not provide quantitative nor theoretical answers to the big question that motivated North's pursuit of a Grand Theory. The embodied neoclassical theoretical apparatus in the cliometric approach was not designed to deal with the determinants of the constraints, thus institutional change and economic performance. Indeed, neoclassical theory is essentially a theory of static choice computation that takes as exogenous all the elements that constitute social cooperation and sustain economic coordination. In addition, this approach could not rigorously test alternative explanations for the rise and decline of nations. Economic historians were forced to narrow their inquiry to more manageable empirical questions (e.g., Wallis, 2016, p. 939).

From North's perspective, constructing an analytical framework to explain the rise and fall of nations, i.e., their social-political structure and economic performance, is the main task of economic history. In this sense, cliometrics was not upon this task since it did not replace the old historical truths with a systematic explanation of economic change. As North (1978b, p. 963) put it, "[c]liometricians have turned their backs on a long tradition stretching back from Joseph Schumpeter to Karl Marx to Adam Smith." In his 1973 presidential address to the Economic History Association, North urged his cliometrician peers to go "Beyond the New Economic History" (1974). In his view, while maintaining the utility-maximizing hypothesis and opportunity cost analysis, it was necessary to broaden the frame of reference of neoclassical economics to include a theory of property rights derived from transaction costs, a theory of demographic change, a theory of the state, a theory of ideology, and other sources of non-market decision making. North realized that the Great Enrichment and the rise of Western civilization as

the most economically developed and complex open society in the world could not be explained by some form of the ergodic and static neoclassical production function.

However, if institutions are efficient devices created to capture exchange gains as maintained in the neoclassical institutional innovation model, it is impossible to explain how some countries experienced long-run economic stagnation or decline and others economic growth and shared prosperity. This basic empirical fact is completely contradictory with the implications of standard neoclassical economic theory and constitutes one of the central tensions of the adoption of neoclassical economics to treat the economic past. In the late 1970s, North realized that institutions and institutional change are first and foremost determined by social and political choices. Furthermore, these choices are constrained by individuals' subjective interpretations of the external objective world. Therefore, he was forced to recognize that a satisfactory answer to the Smithian grand problem must lie in the construction of an analytical framework that explains how institutions induce long-run economic stagnation and decline. Moreover, it must develop a political economy model that accounts for the social and political decision-making processes that determine the underlying source of institutions and property rights structure. Finally, it should explain the nature of the individuals' subjective worlds and the ideological frame of reference that constrains their choices and propels collective action by reducing free riding.

In his book *Structure and Change in Economic History* (1981), North focuses on building a theory of institutions that explains how inefficient property rights structures are likely to emerge as recurrently demonstrated in universal economic history. To this purpose, he internalizes into the neoclassical utility maximizing hypothesis the multidimensional sphere of transaction costs. This results in the incorporation of three building blocks into neoclassical economic theory, i.e., a theory of property rights and contractual arrangements, a simple neoclassical theory of the state, and a sketch of a theory of ideology. (Indeed, North will develop in more detail the cognitive foundations of shared mental models and beliefs in his later work.) In particular, North develops in chapter III of his book "A Neoclassical Theory of the State" that specifies and enforces the property rights structure in which individuals' maximizing actions unfold.

North's pursuit of a Grand Theory for why some nations are rich and others poor guided his theoretical evolution and was a definitive line of profound continuity and progression in his intellectual journey. However, this committed pursuit also produced deep antagonisms within his adopted neoclassical analytical framework. In endorsing the New Economic History revolution

in the early 1960s, North gradually perceived the limitations of the cliometric approach to economic history. In the late 1960s, when he changed to European economic history, the inadequacy of the neoclassical analytical instruments to provide a successful explanation of the political and economic institutional infrastructure, social change, and economic performance through time became evident.

In the early 1970s, North became increasingly dissatisfied with the standard approach. In his 1973 presidential address, North urged his peers to go beyond the received theoretical tradition that was the backbone of the New Economic History. It should be noted that North (2008, p. 203) was not against neoclassical economic theory *in toto*. Indeed, he considers the economic way of reasoning, synthesized in price theory and opportunity cost, "the most powerful tool of analysis in all the social sciences, and you don't give that up." Nevertheless, the received standard theory and its hypotheses were wholly inadequate to account for the different institutional matrices and economic change, urging for the modification of neoclassical assumptions and progressive theoretical innovations. The central tension between the received neoclassical tradition and its failure as an approach to understanding the Smithian grand social coordination problem shaped North's intellectual journey and subsequent analytical developments.

Standard neoclassical economics simply could not explain the fundamental historical and empirical fact that until very recently human civilization was economically stagnated and produced not economic growth and social welfare but social decline, economic stagnation, and political violence. The failure of standard neoclassical apparatus to understand the Great Enrichment and the economic past of societies propelled North to engage in active theoretical construction, rejecting some of the traditional hypotheses of general equilibrium theory (in particular, the instrumental objective rationality postulate) and extending the neoclassical framework with neglected elements such as transaction costs, property rights, and contracts that constitute the institutional structure of an economy. In the later 1970s and early 1980s, this resulted in the creation of a new field of inquiry that could remedy this state of affairs. It was the birth of New Institutional Economics.

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# Manufacturing a New Institutional Social Science: Douglass C. North on Transaction Costs, Institutions, and Economic Change (1981-2005)

ABSTRACT. The essay investigates from a historical perspective the attempt of Douglass C. North to construct a New Institutional Social Science, focusing on the period between 1981 and 2005. The manufacturing of a New Institutional Social Science is primarily constituted of an integrative effort to build a grand theory involving the multidisciplinary knowledge from all the social sciences merged with cognitive science, in particular how the human brain works and societies learn, to explain the fundamental Smithian social coordination problem associated with the dynamic evolutionary process of economic change. This theoretical effort is significantly broader in analytical scale and intellectual scope than the generally delineated in traditional New Institutional Economics, investigating unexplored areas that go remarkably beyond standard neoclassical economic theory. In the early 1980s, North perceived that the new intellectual path ahead was *terra incognita*, necessarily involving an active theoretical building instead of passively using the existing standard neoclassical theoretical apparatus. Transaction cost analysis opened a completely new territory regarding political institutions, the pivotal role of ideology and informal norms of behavior, and the intertwined dynamic co-evolution of institutions and technological progress. In the late 1980s and early 1990s, North extended the transaction cost approach to the political realm of exchange towards a theory of institutional change. Political markets are inherently more prone to inefficiency due to higher transaction costs, producing inefficient property rights structures and rent-seeking economic institutions. In the 1990s, North began to puzzle seriously about the instrumental rationality postulate of neoclassical economics, investigating the cognitive foundations of how human beings construct their subjective mental models derived from personal experiences and cultural learning. In the late 1990s and early 2000s, North developed an evolutionary cognitive-institutional approach to economic change, stressing the adaptive efficiency concept.

Key-words. Douglass C. North, New Institutional Economics, New Institutional Social Science, transaction costs, institutions, economic change.

RESUMO. O ensaio investiga em uma perspectiva histórica a tentativa de Douglass C. North de construir uma Nova Ciência Social Institucional, focando no período entre 1981 e 2005. A criação de uma Nova Ciência Social Institucional é primariamente constituída de um esforço de integração para a construção de uma grande teoria envolvendo o conhecimento multidisciplinar de todas as ciências sociais combinado com a ciência cognitiva, em particular como o cérebro humano funciona e sociedades aprendem, para explicar o problema Smithiano fundamental de coordenação social associado ao processo dinâmico e evolucionário de mudança econômica. Esse esforço teórico é significantemente mais amplo em escala analítica e escopo intelectual do que o geralmente delineado na Nova Economia Institucional, investigando áreas inexploradas que vão muito além da teoria econômica neoclássica tradicional. No começo dos anos 1980, North percebe que o caminho intelectual à frente era *terra incognita*, necessariamente envolvendo uma construção teórica ativa ao invés da utilização passiva do aparato teórico neoclássico. A análise de custo de transação abriu um território completamente novo em relação às instituições políticas, o papel pivotal da ideologia e de normas informais de comportamento, e a dinâmica co-evolução entrelaçada de instituições e progresso tecnológico. No final dos anos 1980 e começo dos anos 1990, North estendeu a abordagem de custo de transação para a esfera política das trocas em direção a uma teoria de mudança institucional. Os mercados políticos são inerentemente mais propensos à ineficiência devido aos altos custos de transação, produzindo estruturas de direitos de propriedade ineficientes e instituições econômicas baseadas em rent-seeking. Nos anos 1990, North começou a se indagar seriamente sobre o postulado de racionalidade instrumental da economia neoclássica, investigando os fundamentos cognitivos de como os seres humanos constroem os seus modelos mentais subjetivos derivados de suas experiências pessoais e aprendizagem cultural. No final dos anos 1990 e começo dos anos 2000, North desenvolveu uma abordagem evolucionária cognitiva-institucional para a mudança econômica, enfatizando o conceito de eficiência adaptativa.

Palavras-chave. Douglass C. North, Nova Economia Institucional, Nova Ciência Social Institucional, custos de transação, instituições, mudança econômica.

JEL. B31, N00, O43.

## I. PROLOGUE: BEYOND NEW INSTITUTIONAL ECONOMICS

In his 1975 book *Markets and Hierarchies: Analysis and Antitrust Implications* (1975), Oliver E. Williamson first coined the term "New Institutional Economics." In the first chapter entitled "Toward a New Institutional Economics," Williamson (1975, p. 1) sustains that a broad range of new "[a]spects of mainline microtheory, economic history, the economics of property rights, comparative systems, labor economics, and industrial organization" composes what might be generically referred as a New Institutional Economics (NIE).

According to Williamson (1975, p. 1), the common thread permeating all these fields is "(1) an evolving consensus that received microtheory, as useful and powerful as it is for many purposes, operates at too high a level of abstraction to permit many important microeconomic phenomena to be addressed in an uncontrived way; and (2) a sense that the study of 'transactions,' which concerned the institutionalists in the profession some forty years ago, is a core matter and deserves renewed attention." New institutionalist economists mainly differ from the old American institutionalist tradition, epitomized in the triumvirate Thorstein Veblen, Wesley C. Mitchell, and John R. Commons, in that their conceptual developments start with the received neoclassical economic theory. In consequence, Williamson argues that these theoretical advances are considered "complementary to, rather than a substitute for, conventional analysis" (e.g., see also Rutherford, 1996, 2001).[50]

In the early 1980s, the new institutionalist network was gaining visible configuration. On June 6-10, 1983, in Mettlach, Germany, Rudolf Richter and Eirik Furubotn organized the first of the subsequent series of annual international seminars on NIE. Around 1980, Richter became editor

[50] In his John R. Commons Lecture Award, Douglass C. North (1992a, p. 3) writes that "[a]nyone who goes back to read *The Legal Foundations of Capitalism* (1924) will find that Commons anticipated much of the evolving literature of the New Institutional Economics. He and the other practitioners of the old institutional economics - Veblen, Mitchell, [Clarence] Ayres - gave us imaginative insights, perceptive description, quantitative measurement. They did not, however, give us theory. And it is the development of an integrated, systematic body of theory that not only is the hallmark of a discipline, but also provides the essential scaffolding for the further development and progress of a discipline. The New Institutional Economics remedies (albeit imperfectly) that theory defect." New Institutional Economics, North continues, builds on, modifies, and extends neoclassical economic theory, retaining the basic assumption of scarcity and competition that is the foundation of the neoclassical choice-theoretical approach that underlies modern microeconomics. However, New Institutional Economics abandons what he called the instrumental rationality postulate, i.e., "the assumption of neoclassical economics that has made it an institution-free theory." (We develop this point in detail in sections IV and V). In another place, North (1997a, p. 257) writes that "[a]s a graduate student I had read Thorstein Veblen and John R. Commons and been impressed by the insights they provided into the working of economies, but they did not provide a theoretical framework that we could use to explain and analyze economic history. The old institutional economics, because it failed to provide such a theoretical framework, never posed a serious alternative to neoclassical theory."

of the traditional *Zeitschrift für die gesamte Staatswissenschaft*, until then a German language journal. Richter (2005, pp. 164-5) wanted to internationalize the *Zeitschrift* and NIE provided a "suitable specialty, a niche," that remained close to the original intentions of the journal (law and economics and public choice already had their own outlets).[51] The series of seminars, known as Wallerfangen Conferences, were organized by different people and held at distinct places. Since 1984, the papers presented at each annual conference have been published in the *Journal of Institutional and Theoretical Economics* (*JIET*), the internationalized version of the *Zeitschrift.*

In 1997, the International Society for New Institutional Economics (ISNIE), later renamed Society for Institutional & Organizational Economics (SIOE), was founded after its first conference on "The Present and Future of the New Institutional Economics," organized by Alexandra Benham and Lee Benham on September 19-21 at Washington University in St. Louis, Missouri. The founding of ISNIE originated in discussions involving Ronald H. Coase, Douglass C. North, Oliver E. Williamson, Claude Ménard, Mary M. Shirley, Alexandra Benham, Lee Benham, and John Dobrak. The goal was to create a formal organization to connect the dispersed institutionalist international network, facilitating the production and exchange of ideas on the different branches of institutional and organizational analysis.

The creation of the ISNIE was possible through the primary executive efforts of Alexandra and Lee Benham in conjunction with the supporting driving force of Coase, North, and Williamson. Ronald Coase was appointed the founding president of the ISNIE (1996-1997), followed by the election of Douglass North (1997-1999) and Oliver Williamson (1999-2001). According to its mission statement, the purpose of the Society "was to promote rigorous theoretical and empirical investigation of the institutions of social, political and commercial life using approaches drawn from economics, organization theory, law, political science, and other social sciences." The 1997 Inaugural Conference was held under the presidency of Ronald Coase and had three programmatic lectures given, in this order, by North, Williamson, and Coase.

In his opening lecture, North argued that the creation of the International Society "could well represent a defining moment in the history of the social sciences" since it brings the hope of

[51] Founded in 1844, one of the oldest journals in political economy, to explore the relations between society and the state, the *Zeitschrift* was influenced by the French encyclopedists, Auguste Comte, and the German "entire science of the State" or *Staatswissensch*. Emphasis soon changed to political economy heavily influenced by the German Historical School approach. After some decades, it then shifted again to more analytical theoretical works. As Furubotn and Richter (1984, p. 6) write in their editorial preface, "[n]ew developments in institutional economics are reflected in the contributions currently published by the *Journal* - which thus resumes its old tradition while giving proper attention to the need for maintaining the analytical rigor of modern theoretical work."

remedying the transformation in the twentieth century of economics in an overly abstract, formal, and static discipline (Furubotn and Richter, 1997, p. 781). We must, he continues, develop a grand theory grounded in how the human mind works and how societies learn through time to understand the institutional structure of economies and the evolutionary dynamic process of economic change. This scientific inquiry is only achievable with a multidisciplinary approach embedded in the cross-fertilization of the social sciences.

As North would put it many years later, "[n]eoclassical economics was not developed to deal with these grand issues. But to understand the dynamics of change requires a multidisciplinary approach involving knowledge from all the social sciences as well as an understanding of how societies learn. We need grand theorising to understand the rise and fall of nations" (Snowdon, 2016, p. 124). The effort of integrating diverse approaches and scientific disciplines within a grand analytical theoretical framework constitutes not just a New Institutional Economics, but what North calls a New Institutional Social Science. In an interview with Arnold Kling and Nick Schultz (2009, p. 149), North is very conscious and explicit on this point.

> "When Ronald Coase and I started the [International Society for] new institutional economics, I proposed that we call it the 'the new institutional social science,' but Ronald said, 'if you do, I will not be a part of it.' And so I said, 'OK, I withdraw.' Obviously I want Ronald to be with me on it, but I think it was a mistake. And as I get on in life, I think it's a bigger and bigger mistake, because it is confining our discussion much too narrowly. [...] I think Ronald is a traditional economist, and for him, economics is economics. For me, it never was."[52]

In this essay, we investigate from a historical perspective the attempt of Douglass C. North to construct a New Institutional Social Science, focusing on the period between 1981 and 2005. The

[52] In an interview, Ning Wang (2014, p. 109) asked Coase: "How do you characterize yourself, an insider or outsider [to mainstream economics]?" Coase replied: "I am an economist, and always want to improve our analysis of the working of the economic system. That's all that I care. Anything else is not my concern." In another place, North remembers: "When Ronald Coase and I got honorary degrees at Columbia in 1988, I think it was, we each had to give a talk. And Ronald gave a talk about the kind of work he was famous for, which was taking into account transaction costs and so on. We had a much deeper understanding of economic organizations. And I gave a talk about how this whole framework of transaction costs really was the framework we should think in for dealing with societal change overall. And Ronald came up to me afterwards and said, 'I never thought about that.' It was a whole new concept and it's what I've been doing ever since" (Kling and Schulz, 2009, p. 151).

manufacturing of a New Institutional Social Science is primarily constituted of an integrative effort to build a grand theory involving the multidisciplinary knowledge from all the social sciences merged with cognitive science, in particular how the human brain works and societies learn, to explain the fundamental Smithian social coordination problem of why some countries are rich and others poor associated with the dynamic evolutionary process of economic change. This theoretical effort is significantly broader in analytical scale and intellectual scope than the generally delineated in traditional New Institutional Economics, investigating unexplored areas that go remarkably beyond the fundamental hypotheses of standard neoclassical economic theory. Previous analysis in the secondary literature on North's intellectual evolution, such as the three stages division advanced by David W. Galenson (1983) and developed by Groenewegen, Kerstholt, and Nagelkerke (1995), Graham A. Brownlow (2010), and others, argued that from 1981 onwards the so-called North III could be classified as a predominantly historical economist that refined the neoclassical economic theory incorporating largely ignored themes in the standard model, particularly questioning the objective rationality postulate.

In contrast, Michel Zouboulakis (2005) argues that North III did much more from 1981 onwards than to refine the neoclassical standard model, making a turn toward historical and evolutionary economics and cognitive science. Indeed, in the early 1990s, North realized that he could not respond to the theoretical problems he had placed as central to the social sciences without dealing with a much broader analytical perspective that connected the individual with the wider society. We propose that a North IV can be distinguished from 1990 onwards since North completely departed from the neoclassical instrumental rationality postulate and progressively incorporated the cognitive foundations of social institutions and evolutionary cultural learning towards a New Institutional Social Science. This interpretation is consistent with North's lifelong pursuit of a grand theory to explain the Smithian social coordination problem and the economic past of societies, as emphasized by his former Ph.D. student and co-author John Joseph Wallis (2016, p. 938).

Accordingly, with the publication of his famous book *Structure and Change in Economic History* (1981), North abandoned his earlier naive efficiency view of institutions and began a progressive critical reaction to the instrumental rationality postulate of neoclassical economics. In the early 1980s, North perceived that the new path ahead was *terra incognita*, necessarily involving an active theoretical construction instead of passively using the existing standard

neoclassical theoretical apparatus. Moreover, this new theoretical path should start with the dismantling of standard neoclassical economic theory assumptions. This intellectual movement was in effervescent contrast with the road North and his economic historian colleagues traveled in the mid-1950s when the New Economic History revolution acritically appropriated the existing neoclassical theoretical apparatus and econometric quantitative techniques to reinterpret economic history. In the later 1970s and early 1980s, North's research program contributed to the intellectual birth of New Institutional Economics. Institutions are devices to reduce uncertainty and create order in the human behavioral propensity to exchange and social interaction. In a world of pervasive uncertainty, institutions constrain and limit the choices available to the players, making human behavior and social interaction predictable.

As advanced by Ronald Coase in his path-breaking article "The Nature of the Firm" (1937), engaging in contractual exchange relationships in the decentralized market process is highly costly. Transaction costs are manifold. We can name the costs of discovering and keeping track of the relevant prices, determining the quality and bargaining price, measuring the multidimensional valuable attributes of the property rights attached to a commodity or service exchanged in the market, monitoring and enforcing the intrinsic incomplete contractual agreement, etc. Indeed, Coase's main argument is that a hierarchical organization such as the firm came into existence because it is an organizational form capable of minimizing the rent dissipation and transaction costs among the contracting parties. The existence of diverse organizational arrangements in modern market economies over the decentralized individual contracts in the market process lies in the attempt of contracting parties to minimize related transaction costs. Therefore, Coase argued that the existence of firms and their relative extension are determined by the costs of engaging in a market marginal transaction.

North (1990a, p. 3) classically defines institutions as the humanly devised constraints that shape repeated human interaction in coordination, cooperation, and competition. An institutional matrix is composed of formal rules (e.g., constitutions and written laws), informal norms of behavior (e.g., cultural norms, social conventions, and habits), and the effectiveness of their enforcement (which are carried by delegated third parties, second parties retaliation, or self-imposed codes). In the 1980s, North incorporated the multidimensional transaction costs of measuring, specifying, and enforcing the contractual arrangements and property rights that support the exchange processes to ground in an analytical framework the human progression of a

world of simple, personal, and tribal exchange to a society marked by complex and impersonal exchange, extended social cooperation, and division of knowledge and labor.

The passage of a societal organization characterized by personal exchange embodied in a rigid cage of norms of behavior, traditions, and habits to decentralized impersonal exchange revolves around the creation and importance of a third party to reduce transaction costs and enforce social cooperation, avoiding free-riding and opportunistic behavior. This third party to bilateral exchanges is the state. Thus, the transaction cost analysis also opened a new territory regarding the political institutions, in particular a theory of the state, that provide the formal and legal institutional framework in society, defining the property rights structure and enforcing impersonal contractual arrangements. The political institutions determine the choice and supply of economic institutions. In addition, the transaction cost approach to institutional and organizational analysis revealed the pivotal role of ideology and the intertwined dynamic co-evolution of institutions and technological progress in a world of impersonal exchange. Ideology is an economizing device of information to make sense of the external world, framing collective decision-making in a free-riding context.

In the later 1980s and early 1990s, North extended the transaction cost approach to the political realm of exchange towards a theory of institutional change. In political markets, he argued that the contractual arrangements between constituents and legislators and legislators and their agents intrinsically involve commitments made for a future date with highly uncertain payoffs. There are congenital high transaction costs in political exchanges because it is extremely costly to measure the multidimensional qualities of what exactly is being traded. Thus, it is also highly costly to enforce the ethereal exchange terms. In this context, there is no way of ensuring credible commitment to effect political trade agreements. Therefore, the highly uncompetitive and inefficient political markets generate extractive political institutions that produce inefficient property rights structures and rent-seeking economic institutions. This scenario also crucially increases the importance of ideology and shared mental models in collective decision-making. In this connection, in this same period, North began to puzzle seriously about the instrumental rationality postulate of neoclassical economic theory that assumed that individual agents have a perfect and objective perception of external reality.

In a classic article on “Shared Mental Models: Ideology and Institutions” (1994), Arthur T. Denzau and North started to deeply investigate the cognitive foundations of how humans

construct their subjective mental models derived from personal experiences and cultural learning in the intergenerational transfer of knowledge, habits, and social norms of behavior in particular conditions of time and place. Utilizing the distinction between institutions and organizations delineated in his extremely influential book *Institutions, Institutional Change and Economic Performance* (1990a), North developed a theory of institutional change that rests on the interaction between institutions and organizations and the cognitive learning process that entrepreneurs and organizations acquire throughout time and across space.

In the late 1990s and early 2000s, North continued to investigate the interplay between cognition and institutions, making a theoretical sketch of an internal cognitive-external institutional approach that could be the foundation of a New Institutional Social Science to analyze how the human mind and societies learn and evolve throughout time. This fundamental evolutionary cognitive-institutional approach to economic change is epitomized in North's 2005 book *Understanding the Process of Economic Change* (2005), where he developed the pivotal concept of adaptive efficiency which is an ongoing condition in which society continues to modify or create new institutions as problems evolve. In this period, although North has gone far in his intellectual attempt to construct an integrated cognitive-institutional approach to understanding the social, political, and economic institutions and change, in his opinion we still "are in the midst of devising a New Institutional Social Science." As he put it, "[w]e're a long ways [sic] from it" (Kling and Schultz, 2009, p. 162).

## II. FROM NEW ECONOMIC HISTORY TO NEW INSTITUTIONAL ECONOMICS (1950-1981)

Douglass North's initial major research project concentrates on the determinants of economic growth within each economy, with a particular emphasis on the evolution of American regional productive specialization and social coordination through markets. In this theme, North was greatly influenced by his mentor and Ph.D. dissertation adviser at the University of California at Berkeley, the interdisciplinary economic historian Melvin Moses Knight (one of two distinguished economists who also were Frank H. Knight's brothers). M. M. Knight's (1928) economic and historical approach to analyzing past economies focused on the interrelations

between the geographical resource endowment constraints and the nature of social and economic organizations developed to deal with the fundamental scarcity problem imposed on every society.

However, in North's (2009, p. 163) view, Knight's emphasis on the ecology of the place and implicit regional growth theory lacked an explicit theoretical formulation. In his first influential article on "Location Theory and Regional Economic Growth" (1955), published in the *Journal of Political Economy*, North challenged the traditional view held by location and regional theorists that economic development occurred in a sequence of stages, from a self-sufficient subsistence and agricultural economy to a region specialized in tertiary exporting industries. This was the received view exposed by, e.g., Edgar M. Hoover (1937) and August Lösch (1938). In contrast, North (1955) argues that the economic history of the United States is incompatible with this stylized economic growth pattern. From the beginning of American colonization, North continues, settlement in new regions was conditioned by external market trade, with subsistence being only a frontier condition.

In the mid-1950s, North developed a neoclassical analytical framework to explain regional economic growth based on an export-led staple (i.e., the chief commodity produced by a region) growth theory. In this endeavor, North (1955, p. 247) was profoundly inspired by Harold Innis' (1920, 1933, 1940) "staple thesis" that attempted to explain Canadian social, political, and economic development as decisively shaped by a sequence of exporting staples commodities, such as fur, fish, lumber, wheat, and the mining (especially coal) and metals sector. Along the same lines, in North's (1955, p. 257) view, the economic development of the United States was characterized by the attempt to capture the Smithian gains of local comparative advantages through regional specialization and inter-regional and external trade. In particular, "[t]he success of the export base has been the determining factor in the rate of growth of regions."

In his first book, *The Economic Growth of the United States, 1790-1860* (1961), North amalgamates Adam Smith's (1776) analytic vision, Innis' staple hypothesis, and Guy S. Callender's (1902) classic three-region model to re-interpret the development of antebellum American economic history. One of the first cliometric works, North's book innovates in making an extensive data collection and empirical work structured within his staple export-led "skeletal framework" (as he called it). As North (1961, p. 1) makes clear, "[t]he analytical framework of this study is a composite of several propositions, the most important of which was a cornerstone of [Smith's] *The Wealth of Nations*." From Smith, North appropriates the central proposition that

specialization and exchange within the market process coordination are the driving forces of economic growth. A significant corollary is the crucial role of external trade in extending the limits of the available market, which limits the division of labor (see Stigler, 1951)

Indeed, the importance of foreign trade and external demand can be traced back to Smith's approach to the "vent for surplus." In addition, it means incorporating production factors (such as land, labor, and capital) into the realm of regional specialization and the market price coordination mechanism - which, in turn, drives response adjustments by utility-maximizing individuals (e.g., including institutional innovations and the development of concerted collective action towards reducing transportation costs, social overhead capital, education, and technological progress).[53] The expanding income from the export base also led to the natural emergence of manufacturing and services industries because of locational advantages (except for footloose industries), widening the export base as the region develops until the point at which the staple export base ceases to be identified as a region.[54]

However, these effects depend on the nature of the production possibilities frontier of the region's export sector. In particular, the magnitude of the divergence of the staple expected private return rate in relation to other goods and services. A region can remain trapped in its single staple base, not diversifying and discovering other comparative advantages and not sustaining secondary and tertiary industries, urbanization, and economic growth. Contrasting the development of the South and West until the American Civil War, North (1959, p. 945) argues

[53] In his first book, North (1961, p. vii) states that economic change is mainly and primarily determined by relative price movements. "This study is based on the proposition that U.S. growth was the evolution of a market economy where the behavior or prices of goods, services, and productive factors was the major element in any explanation of economic change. Institutions and political policies have certainly been influential. They have acted to accelerate or retard growth on many occasions in our past, primarily by affecting the behavior of the prices of goods, services, or productive factors either directly or indirectly. But they have modified rather than replaced the underlying forces of a market economy."

[54] This suggests that industrialization was not the key or a necessary but difficult condition to early American economic growth as regional theorists and others had argued (e.g., Galbraith, 1951; Lewis, 1954). Walt W. Rostow (1960) advanced this hypothesis in the concept of take-off within the Rostovian stages model of economic growth. North's "A Note on Professor Rostow's 'Take-off' into Self-Sustained Economic Growth" (1958a) is precisely a critique of the validity of Rostow's (1956) hypothesis for the United States. Rostow considered railroad expansion the major impetus to American industrialization and economic growth. In his classic work, however, Robert Fogel (1964) demonstrated that the total (i.e., interregional plus intraregional) social savings of railroads were less than 2 percent of GNP in 1890. In addition, Fogel argued that the backward linkages of railroads in other sectors were not as large as Rostow hypothesized because railroads consumed only a limited portion of input commodities. Therefore, Fogel and other economic historians argued that railroads were not a leading sector that induced widespread industrialization. Indeed, North (1958a, p. 74) writes that "one could advance a hypothesis which is the reverse of Rostow's." See also Thomas Cochran (1961), who argued that the Civil War did not play a major role in American industrialization and exerted mainly a retarding force.

that this can be explained according to (i) the natural endowments of the region (at any given level of technology), (ii) the character of the export industry, and (iii) changes in technology and transfer costs.

In the preface of his book, North (1961, p. vi) notes that "I am in his [Callender's] debt." Callender's classic article on "Early Transportation and Banking Enterprises" (1902) delineates a three-region model with a manufacturing Northeast, a cotton export base in the South, and a food-producing Northwest. Each region is interdependent on another to realize its comparative advantage. However, productive specialization and inter-regional exchange gains are hampered by internal transportation costs and an underdeveloped financial system. For 1815-1843, North (1961, p. 68) argued that a substantial external demand for cotton led to an expansion of the Southern export base, shaping the pattern of regional specialization. With cotton as "the most important proximate cause of expansion," the South required foodstuffs from the Northwest and imported manufactured goods for the Northeast.

As mentioned, North's cliometric research project that culminated in his 1961 book involved a comprehensive collection and interpretation of new quantitative data on international trade and capital flows (North, 1956b, 1960b, 1960c), domestic inter-regional trade, transportation costs such as ocean freight rates and shipping earnings (North, 1958b, North and Heston, 1960), and aggregate macroeconomic indicators (North, 1961b). North's (1960a) most celebrated quantitative contribution was the revised estimates of the United States' balance of payments from 1790 to 1860, published in William Parker's proceedings edited book of the 24th Conference on Research in Income and Wealth, *Trends in the American Economy in the Nineteenth Century* (1960).[55] However, North would soon discover that New Economic History, as expressed in better quantitative data allied with standard neoclassical theory, was not capable of sustaining a comprehensive testable theoretical explanation for evolving economic structures, their change over time, and their performance.

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[55] This conference was a joint meeting organized by the Economic History Association (EHA) and the National Bureau of Economic Research (NBER) and occurred in September 1957 in Williamstown, Massachusetts. It marked the official birth of the New Economic History, or cliometrics (based on Clio, the Greek muse of history), which consists of the systematic application of economic theory and quantitative methods to the field of economic history, with particular reference to testing alternative hypotheses. In 1956-7, invited by the NBER director of research Solomon Fabricant, North spent the next academic year as a research associate at the Bureau. During his year at the NBER, North (1997a, p. 255) did the work on his early major quantitative study of the balance of payments of the United States from 1790 to 1860. North recalls that this "was an enormously important year in my life" (cf. North, 1960a, p. 573).

In the 1960s, the cliometric creed seemed to emulate Lord Kelvin's dictum that science is measuring. Thus, if we can measure it, then we can explain it. Nevertheless, as John Joseph Wallis (2016, p. 939) put it, the cliometric approach did "not deliver quantitative answers to the big questions he [North] wanted to ask," being narrowed "on more manageable empirical questions. The income and product data produced a clearer picture of the aggregate economy, but did not afford the ability to test explanations about why economies grew, not even in the case of the United States."[56] Although excited in the early 1960s by the cliometric revolution promises in the field of economic history (e.g., North, 1963), North quickly changed his evaluation of "The State of Economic History" (1965, p. 90) to a very critical tone. The results of the New Economic History, he sustains,

> "have been generally disappointing. Too much of it has been dull and unimaginative, and there seems to be a widespread conviction that econometric techniques, the computer, and running a few regressions can substitute for theory and imagination. Some of the new economic history written by economists is of distressingly poor quality. Some of it is so imprecise and fuzzy as to make it difficult, if not impossible, to make any model at all."

North (1965, p. 91) concludes his critical evaluation of the state of economic history by saying that "we need to sweep out the door a good deal of the old economic history, to improve the quality of the new economic history, and it is incumbent upon economists to cast a skeptical eye upon the research produced by their economic history colleagues to see that it lives up to standards which they would expect in other areas of economics." In the 1966-7 academic year, North went to live in Europe as a Ford Faculty Fellow, finishing his second book on American economic history, *Growth and Welfare in the American Past: A New Economic History* (1966). In sequence, he decided to change from American to European economic history.

At the first moment, North anxiously and naturally advocated "A New Economic History for Europe" (1968a, p. 147), arguing that "European economic history is in need of fundamental

[56] Reviewing North's 1961 book after sixteen years, Stanley L. Engerman (1977, p. 248) argues that the book "framed, if not originated, a number of hypotheses about the process of American economic growth and about various specific relationships which have been and remain the basis of empirical work. In examining its importance the question is not just whether on certain specific points North was right, but also whether the book generated important hypotheses for empirical testing. In these latter regards here clearly was an important book, and, while it may seem to be incomplete or to fail on some specific issues, we should add that even now it is often unclear what the 'right' answers might be."

restructuring" and only the work of the "new economic historian thoroughly trained in economic theory and statistics" could remedy this situation. *Nonobstant*, in his process of changing research interests, North (2009, p. 165) realized in a straightforward manner that standard neoclassical economic theory could not account for European economic history with its different fundamental institutions and organizations of the past. This frame contrasted with the United States, which has always been a market economy to some extent. "But Europe? How could you talk about feudalism and the manorial system with neoclassical theory?"[57] This tension had a great impact on North's sentiments toward the cliometric approach and its embodied theoretical approach. As North (1997a, p. 257) writes, he

> "quickly became convinced that the tools of neo-classical economic theory were not up to the task of explaining the kind of fundamental societal change that had characterized European economies from medieval times onward. We needed new tools, but they simply did not exist. Neoclassical theory was concerned with the operation of markets and assumed the existence of the underlying conditions that were a prerequisite to the operation of markets. It had nothing to say about how markets evolved. Moreover it was a static theory, and we needed to have a theory that was dynamic and could explain the evolution of economies through time. We needed new tools, but they simply did not exist."

This deeply felt, profound, and far-reaching conversion experience is marked in North's 1973 presidential address to the Economic History Association (EHA), meaningfully entitled "Beyond the New Economic History" (1974). In his presidential address, North (1974, p. 1) asserts that "the new economic history as it has developed has imposed strictures on inquiry that narrowly limit its horizons - and that some of my former revolutionary compatriots show distressing signs of complacency with the new orthodoxy." Although the scientific methodology toward empirically testable propositions marked a clear difference between the new and the old economic history, what really constitutes the cliometric particular contribution is its implicit theoretical apparatus. In this sense, therefore, North argues that the grand cliometric conceptual innovation constitutes its grand fundamental constraint.

[57] Surprisingly, North (1955, pp. 243-4) already stressed this methodological point.

According to North (1974, p. 1), "[i]t is the systematic use of standard neo-classical economic theory which both has provided the incisive new insights into man's economic past and also serves to limit the range of inquiry." Standard neoclassical economic theory assumes given all the institutional constraints involved in individual choices. However, North maintains, the *raison d'être* of economic history is to theorize about these evolving constraints that shape the contours of human decision-making throughout history. In North's (1977a, 193) view, therefore, "for the economist *qua* economic historian, such an approach can only result in sterility" (cf. North, 1978b, p. 963). While North advocated the maintenance of the utility-maximizing hypothesis, he argues that it is necessary to broaden the frame of reference of neoclassical economic theory. The goal is to construct and manufacture a body of theory that "both widens its scope and allows us to include an explanation of the formation, mutation and decay of organizational forms within which man cooperates or competes" (North, 1971, pp. 118-9).[58]

Moving beyond the New Economic History means incorporating in the neoclassical theory of rational choice the evolving historically derived formal and informal institutional constraints that shape human behavior. In 1968, North found a valuable hint of the quantitative importance of institutions and organizations for productivity evolution, in this case, in his article on the "Sources of Productivity Changes in Ocean Shipping, 1600-1850" (1968b). In this paper, he documented that what explained the major increase in total factor productivity in ocean shipping in the nineteenth century was not technology (which was long before available) but reduced piracy, which increased round-trips per year, the size of ships, and their load factor. Ships could carry fewer crew members and armaments, allowing space for more goods. Thus, North (1968b, p. 967) concludes that "the decline of piracy and privateering and the development of markets and international trade shared honors as primary factors in the growth of shipping efficiency over this two-and-a-half century period."

[58] In North's (1981, p. 61) view, "[t]he Marxian framework is the most powerful of the existing statements of secular change precisely because it includes all of the elements left out of the neoclassical framework: institutions, property rights, the state, and ideology." Indeed, in his Berkeley undergraduate days, North became a radical and soon discovered Karl Marx. He was a convinced Marxist. As North (2009, pp. 159-160) recollects, during the 1940s, he was a serious student of Marx. "Marx just had answers to everything," he writes. In a more mature evaluation of the lasting influence of Marx in his thinking, North (1986b) notes that Marx's grand contribution to the social sciences was the analysis of the complex dynamic co-evolution of the productive forces (mainly shaped by technology and technical progress) and the relations of production (the institutional framework conditioned by the political and property rights system). For some interesting but yet divergent Marxian interpretations of North's work, see Wisman, Willoughby, and Sawers (1988), Fine and Milonakis (2003), and Milonakis and Fine (2007).

In the early 1970s, North took his first steps towards a theory of institutional innovation using and extending the neoclassical choice-theoretic approach at the margin. In 1971, co-authored with his former student Lance Davis, North published his book on *Institutional Change and American Economic Growth* (1971). In this work, Davis and North (1970, 1971) extended neoclassical economic theory to the choice of rules based on the utility-maximizing hypothesis, historically illustrating the importance of the concomitant institutional innovation process in American economic growth. They constructed a lagged supply model of arrangement innovation to capture potential (derived from external or distributive) rents created by a disequilibrium shock in the equilibrium system.

Indeed, North elaborates his theory as an extension of Harold Demsetz's (1967) argument on the emergence of property rights. In his classic article, Demsetz (1967) argued that property rights arose when it became the most efficient institutional arrangement to deal with scarcity, illustrating the case of the Montagnais tribe in Northeast Canada. In the same vein, North argued that institutions change when the economic benefits of the new arrangement surpass the expected costs. Therefore, institutional and organizational analysis is modeled as a social maximizing equilibrium outcome, i.e., an efficient equilibrium result of objective maximizing rational agents pursuing profit opportunities. At the same time, North began to collaborate with the young economic historian Robert Paul Thomas.

In his subsequent works, North and Thomas (1970, 1971, 1973, 1977) utilized the neoclassical institutional innovation model described in North and Davis (1970, 1971) to explain the (neolithic) first economic revolution, the rise and fall of the manorial system (caused by the Black Death shock), and the Great Enrichment process occurred in Western Europe. In their controversial book *The Rise of the Western World: A New Economic History* (1973), North and Thomas famously argued that the formation of property rights structures that reduces the divergence of expected private and social returns was the key to economic performance and the Great Enrichment occurred in Western Europe. However, with the assumption that institutions are created to sustain efficient (however defined) coordination, competition, and cooperation through markets and organizations, it becomes impossible to explain long-run poor economic performance.

Indeed, in a general equilibrium world with zero transaction cost, perfect knowledge, and given reasonable hypotheses on population dynamics and savings, economic growth and efficient

resource allocation should be a trivial fact of the ordinary business of life. In his next book, *Structure and Change in Economic History* (1981), North abandoned this naive theory of institutions, incorporating a simple neoclassical theory of the state and a theory of ideology. In addition, he brings other sources of decision-making outside the market process, the household (which has direct implications on demography), voluntary economic organizations such as firms, and government. These four *loci* of decision-making are constantly in discoordination due to transaction costs, free riding, and costly information in conjunction with individuals' conflicting subjective perceptions of reality. These subjective perceptions gradually constitute an individual mental model. When a mental model is socially shared it then originates an ideology. Except for markets, all the other decision-making units are structured and unfold in an environment in which the market price coordination mechanism is nonexistent.

Moreover, in all decision units, the simplifying assumptions of neoclassical economic theory are invalidated. Human interaction occurs in an environment of positive (in general, large) transaction costs, highly imperfect information, and limited cognitive capacity. The costs of measuring, defining, and enforcing property rights and contracts are enormous, implying opportunistic behavior, free-riding, and inefficient political institutions and property rights structures. In his 1981 book, North's major intellectual contribution is to amalgamate within a neoclassical-extended analytical framework the main components that compose the structure of an economy and determine economic change and performance. These are the social, political, and economic institutions, technology, demography, and ideology. In retrospect, North (2009, p. 169) recollects that "[m]y book *Structure and Change in Economic History* is the best book I ever wrote. I wrote that in 1980. I'm very fond of it." North (2008, p. 207) justifies this choice because the second part of the book "had enough illustrations of the implications for history, so I thought it turned out better," even though the theory developed in the first part is admittedly "very incomplete."

## III. THEORY BUILDERS, RATHER THAN JUST THEORY USERS: BUILDING NEW INSTITUTIONAL ECONOMICS IN THE PATH OF *TERRA INCOGNITA* (1981-1989)

In 1997, half of the key founding members of the International Society for New Institutional Economics (ISNIE) were also permanent faculty of the Center for New Institutional Economics

(CNIE) at Washington University in St. Louis. These were Douglass C. North, Alexandra Benham, Lee Benham, and John Drobak. In 1983, following his retirement from the University of Washington in Seattle, Douglass North moved to the Washington University in St. Louis due to a grant from the Henry R. Luce Foundation, which permitted the creation of the Henry R. Luce Professor of Law and Liberty chair. At the first moment, North organized the Committee on Political Economy, creating a graduate program in Political Economy in January 1984. At the end of this same year, the Committee became a full-extent Center for Political Economy (CPE), which North directed until 1990 (when Norman Schofield assumed office). Some years later, the center was renamed Center for New Institutional Economics (CNIE), ultimately changing again its name to CPE in the late 1990s. In 1999, although remaining a fellow of the CPE, North created the Center for New Institutional Social Sciences (CNISS) at Washington University in St. Louis, directed by Itai Seed, focusing on constructing an interdisciplinary approach to the problems of developing and transitioning economies.

In the first of the Wallerfangen Conferences in June 1983, North delineated his research aspirations for that decade. As Furubotn and Richter (1984, p. 1) wrote in their editorial preface, the basic objective of the symposium was to clarify the nature of the NIE emerging field and its lines of future development. In his remarks on the first Wallerfangen Conference, Ronald Coase (1984, p. 230) writes that "[o]f all the papers presented at the seminar I thought that by North, even though it concentrated on economic history, indicated best what modern institutional economics is accomplishing, although those by Alchian and Williamson were also very enlightening." In standard neoclassical economic theory, institutions are regarded as either neutral or taken as exogenously given. In both ways, institutions and organizations are fundamentally ignored. A symbolic example is the money institution. As it is well known, the standard Walrasian general equilibrium theory is incompatible with the existence of money. As an expression of the first case, the neutrality of institutions, we have the long tradition of money being a veil to relative price movements (cf. Samuelson, 1968).

This pattern is again repeated, for instance, whether an exchange is arranged by the market price coordination mechanism or by the entrepreneur coordinator within a hierarchical organization such as the firm, as Coase demonstrated in his classic article on "The Nature of the Firm" (1937). The same is true, utilizing the standard neoclassical equilibrium theory, whether the entire economic coordination originates from decentralized individuals within the market

process or from a central planner, as famously exposed by the controversy on the possibility of rational economic calculation under socialism. Thus, for instance, in the inaugural article that resumed this controversy in the Anglo-Saxon world, the American economist Fred M. Taylor (1929) argued for the feasibility of a central planner to engage in the practical mathematical solution to the same set of general equilibrium simultaneous equations that describes any economic system.[59]

It is in this critical tone that North began his first Wallerfangen article on "Transaction Costs, Institutions, and Economic History" (1984a). Since the New Economic History revolution, the theoretical framework used to approach the economic past of societies has been standard neoclassical economics. Nevertheless, according to North, neoclassical economic theory is mainly a theory of the optimum static resource allocation under severely restricted hypotheses, in particular, perfect and objective knowledge and zero transaction costs. Traditional economic theory correctly builds upon Adam Smith's ([1776] 1970) fundamental insights derived from the human propensity to truck, barter, and exchange one thing for another, such as the mutually beneficial gains of trade, productive specialization, and social division of labor. *Nonobstant*, this is only one side of the multifaceted exchange phenomenon.

In North's (1984a, p. 7) view, in this sense, "economics is really half a theory." This is true because there are benefits *and* costs of mutually beneficial transactions between individuals in the social sphere of interactions. Accordingly, some social and economic costs and losses arise in expanding transactions through productive specialization and division of labor via expanding the limits of impersonal markets. Once this point is recognized, a whole new theoretical path is open to the travelers "who sit in the seat of Adam Smith," as Lord Acton put it in a letter to Mary Gladstone (Paul, 1904, p. 212). Thus, North (1984b, p. 255) contends that "[u]nlike the path that the new economic historians took a quarter of a century ago when they appropriated the tools of neoclassical economics and econometrics, this path is *terra incognita*. Now we must be theory builders, rather than just theory users." North states that "recent work in economic theory dealing with uncertainty, information costs, and transaction costs are initial building blocks." However, unlike the concerns of the traditional economist, the economic historian has its *raison d'être* to

[59] For a survey on the German-speaking phase in the 1920s and the English-speaking phase of this controversy in the early 1930s, see the paradigmatic book edited by Friedrich A. von Hayek (1935). Indeed, Coase's (1937) pioneer transaction cost argument was decisively shaped and constructed in the context of the controversy on the possibility of rational economic calculation in a socialist community, e.g., as documented by Per L. Bylund (2014) and Keanu Telles (2022).

analyze how the humanly devised constraints that shape human interaction, assumed as given in a certain period, change over time in order to explain economic growth and social change (see also North, 1985a).

On these grounds, North (1984b, p. 256) asserts that traditional transaction cost economics, mainly concerned with industrial organization and epitomized in Williamson's microeconomic approach, typically incorporates "transaction costs as efficient organization solutions to the problems of production." This approach has two deficiencies, North continues, intrinsically associated with its static nature. First, "it takes the political rules of the game as given." Second, it takes the choice of production technique as given - when, in fact, this economic choice is always made relative to the transaction cost involved in employing it. In other words, it takes technology as exogenous, when technical progress is deeply intricate and co-evolves with institutional arrangements (e.g., see Wallis and North, 1994). As a logical corollary, this traditional transaction cost approach has very restricted welfare implications in the Pareto sense. In contrast, North's secular historical analysis does not carry any necessary implication that economic results are socially efficient in the Pareto sense or however efficiency is defined.[60]

Indeed, economists have long misunderstood the nature of transaction costs, regarding exchange as instantaneously and costless as in the standard neoclassical economic theory, unproductive such as in the English classical notion of unproductive labor, or sterile such as in the French Physiocratic vision of the sterile economic sectors (composed by non-agricultural laborers like merchants). Moreover, in general, the traditional national income accounting developed in the twentieth century underestimates the magnitude of transaction costs for three main reasons. First, the transaction costs may be so high that they prohibit exchanges from occurring. Second, transaction costs are not distinguished from other (production) costs in national income accounting. Indeed, the case is that the nature of the economic costs may radically differ from one economic context to another. What in a context may be regarded as a transaction cost, in a vertically integrated firm may be classified as a production cost. Finally, taking the vertically integrated firm case, these internal costs of transacting are not measured by market (i.e., opportunity cost) prices.

[60] For a further critical elaboration on North's disagreements with the Williamsonian approach, see North's evaluation in his concluding comments to the third annual conference on "The New Institutional Economics" (1986a).

Nevertheless, even with these measurement problems, North and Wallis (1987) found that the magnitude of the transaction sector is mainly already treated appropriately as intermediate goods and services in the United States national income accounts. They estimated that the U.S. transaction sector had grown from 25 percent of GNP in 1870 to 45 percent of GNP in 1970. North and Wallis measured the transaction sector by summing up all the resources in the transaction industries (i.e., wholesale and retail trade; and finance, insurance, and real estate) with the wages paid to employees in transaction-related occupations in the non-transaction industries. The results revealed that, in the period analyzed, almost all growth in the transaction sector was realized in the private sector. In particular, the estimates showed that most transaction costs (roughly 56 percent of the transaction sector in 1970) occurred in the exchange of intermediate goods and services between and within firms. These findings quantitatively support, as North and Wallis (1988, p. 654) contend, "that coordinating and monitoring costly inter-firm transactions and controlling the intra-firm processes of production are important tasks in the modern economy."

According to North (1987, pp. 423-4), four major variables compose transaction costs. First, there are the costs of measuring the multidimensional valuable attributes of property rights embodied in goods and services being exchanged between individuals. Property rights are a bundle of rights in general attached to a physical commodity or service exchanged in the market. This property rights notion was advanced by Ronald Coase in his classic article "The Problem of Social Cost" (1960), being later developed by Armen Alchian (1965), Harold Demsetz (1967), Yoram Barzel (1989), and others. For a society to have an efficient property rights structure, we must be able to measure the rights and the performance of agents in hierarchical structures. There are costs of measuring the performance of contractual agents such as the ones that are provided by labor services or tenant and leasing arrangements. Second, contractual arrangements, as the structure of property rights, are intrinsically incomplete due to the economic costs of specifying the virtually infinite states of nature that the contract may include. Therefore, North (1987, pp. 423-4) writes that, in an impersonal exchange process, "contracts must be specified as precisely as possible and elaborate safeguards to enforce compliance" and avoid opportunistic behavior. Third, there are the costs of enforcing property rights and contracts. Because of the measurement and specifying costs, it is difficult to judge if the contract has been fulfilled or violated (and by

whom). Finally, there are the ideological attitudes that "can be measured by the premium people are willing to incur rather than 'free ride.'"

In summary, transaction costs are classified as the economic costs of measuring, specifying, and enforcing the contractual arrangements and property rights that support the exchange processes. In addition, there are the ideological transaction costs of consenting to acceptable formal and informal rules rather than incurring opportunistic self-interested behavior. Essentially, these exchange costs arise because the information is, in the best-case scenario, costly, imperfect, and asymmetric. In the worst-case scenario, information is nonexistent, with the dark forces of uncertainty and ignorance reigning human social interaction. In the standard neoclassical general equilibrium world of perfect knowledge or costless and complete information, the measurement problem is superfluous since each transacting party has all information attributes of what is being exchanged and the performance of contractual agents. Enforcement is unnecessary because the outcome of all contractual disputes will be clear and known *ex ante*.

However, as Yoram Barzel (1982, p. 28) notes in his classic article on "Measurement Cost and the Organization of Markets," market signaling and adverse selection arguably are instances of the general case of the organization of markets and not a particular instance. Measurement is nothing more than the quantification of information. As Barzel writes, "[p]roduct information is defined as information on the levels of the attributes per unit of the commodity and on the actual amount contained in the nominal quantity. Measurements of these magnitudes are subject to error. The greater the variability of the measurement around the true value, the lesser the information about the commodity." According to Barzel (1982, p. 27), the Hong Kong-born American economist Steven N. S. Cheung "should be credited with pointing out the importance of the 'measurement problem.'" Indeed, in his second proposition for price control analysis, Cheung (1971, p. 61) was the first to assert that, with measurement inaccuracies and opportunism, economic organizations and alternative contractual arrangements will tend to be structured to minimize the potential of income dissipation due to measurement problems. To the contract parties involved, the non-exclusive income dissipation is a waste, i.e., exchange gains can still be realized through forming alternative contractual arrangements.

However, Cheung (1983, p. 2) recollects that it was Coase who hinted at the importance of the measurement problem to the choice of contracts. As Cheung writes, "[y]et Coase, aware of the significance and relevance of the measurement problem, suggested in 1969 that I look into the

various measurements adopted in the timber industry. However, the difficulty of obtaining data blocked that attempt." Cheung received his Ph.D. from the University of California at Los Angeles, under the supervision of Armen A. Alchian. From 1967 to 1969, he was a postdoctoral fellow at the University of Chicago, maintaining close contact and intense association with Ronald Coase and Milton Friedman. In 1969, Cheung moved to the University of Washington in Seattle. He greatly influenced other department members, especially Barzel and Douglass North (who was the chairman of the Department of Economics from 1967 to 1979).

As put it by Barzel (2016, p. 44), "Steve arrived at the economics department at the University of Washington as a whirlwind. [...] Rather quickly, informal discussions veered to transaction cost problems. This process also engulfed a large contingent of economic historians, leading among other things, to Robert Higgs' study of sharecropping in the United States. Chief among the converted economic historians was the chair of the department and future Nobel Prize winner Douglass North." Indeed, North (1997a, p. 260) recognizes that he "learned a great deal from both of them [Cheung and Barzel], and their influence is apparent in my next [North, 1981] book." Wang (2014, p. 101) notes that "North said many times that he learned transaction cost economics from Steve, and Steve learned it from you [Coase]."

In his "A Theory of Price Control" (1971, p. 53), Cheung readily acknowledged that his article "stems from an elaborate investigation of the various phases of rent control in Hong Kong from 1921 to 1972." In this paper, Cheung advanced the hypothesis that individuals operate utility-maximizing behavior not only along price margins but in all other possible manageable and controllable margins. In consequence, when prices are controlled by the government, individuals will adjust along these other multidimensional variable margins. At the same time that Cheung arrived in Seattle, Barzel was independently working on his "A Theory of Rationing by Waiting" (1974). Barzel argued that when limited quantities of commodities are provided for free by the government, such as in the case of centrally planned economies, a different equilibrating adjustment occurs by the resource opportunity cost of the time spent waiting in the queue (the "dissipation of rent").

It was not long before they recognized that government price control is just at the one extreme of price control and that private market sellers also control, to some degree, their prices according to some self-imposed constraints. For instance, sellers do not continuously change their prices when confronted with incessant changing demand (e.g., because of information

costs). In this case, sellers adjust along other manageable margins that they have more control over, generally margins with more measurement problems (for instance, the product or service quality). In 1983, Cheung left Seattle to return to his native Hong Kong as a professor at the University of Hong Kong. The bottom line of the importance of the measurement problem is that imperfect knowledge results in the imperfect measurement of the multidimensional qualities of what is being exchanged and contracted. In turn, imperfect measurement results in imperfect specified property rights, thus creating space for opportunistic behavior.

According to North (1984a, p. 8), the combination of standard neoclassical production and transaction costs determines economic performance. Therefore, the integration of transaction costs theory with the traditional neoclassical production theory is essential to understanding the structure and evolution of past and present economies. This new conceptual framework is an essential and indispensable theoretical apparatus for the economic historian in explaining economic growth and social change. The institutional structure of an economy shapes the costs underlying exchange. In North's (1984a, p. 8) view, one way that we can interpret institutions is as contractual arrangements between principals and between principals and agents (where an agent yields authority to a principal). These implicit or explicit, voluntary or coerced, costly contracts are devised to maximize individuals' utility by realizing the gains from trade and exchange as a result of productive specialization and social cooperation, including specialization in violence and coercion. Therefore, a *sine qua non* condition to operationalize complex and impersonal market transactions is some form of centralized political order that establishes property rights, enforces contracts, and organizes exchange.

North (1984a, pp. 8-9) advances an analytical framework that rests on three fundamental assumptions, (i) individuals maximize at any and all margins, (ii) transaction costs are positive, and (iii) ideology modifies and shapes the contours of utility-maximizing behavior. The first assumption implies that individuals "may also gain in disobeying the rules that they, themselves, agree are important for other people to obey." That is, individuals can free-ride. Thus, one of the main functions of organizations "involve[s] attempts to define and enforce rules that it is in the individual's interest to disobey." Regarding the second assumption, the exchange relationship is not, as standard economic theory assumes, an instantaneous and costless trade of a uni-dimensional good or service. Instead, what is exchanged are property rights that have multi-dimensional valued attributes that are extremely costly to specify, measure, and enforce in

the contractual relationship. In a classic agency dilemma, an agent can cheat, shirk, and practice opportunism toward the principal.

It is extremely costly to specify in clear terms the contractual arrangement to constrain the individual self-interested behavior, measure his/her output in the contractual multiple dimensions, and enforce the contractual procedure. Indeed, it is often difficult or impossible to know if a contract has been fulfilled. Moreover, enforcement judiciary officials have their own utility functions. Thus, these officials are themselves agents subject to agency problems. Since third-party judicial enforcement is also imperfect and costly, decisions are greatly influenced by moral and subjective views of contractual justice and fairness. In consequence, we arrive at the third assumption. In North's (1984a, p. 10) opinion, an ideology derives from the individual's previous experience. An ideology is mainly a device that "economizes on the amount of information that people must have" to make sense of the external physical world. An ideology, therefore, also carries a normative view on society, involving normative judgments about the fairness or moral legitimacy of the social institutional infrastructure.

Both geographical and occupational specialization produce contrasting individual experiences and divergent ideologies. North (1988, p. 15) defines ideology as the "subjective perceptions that people have about what the world is like and what it ought to be." These sources of division of labor and knowledge result in market impersonal exchange, breaking the explicit or implicit contractual arrangements from the influence of personal relationships and shared customs, traditions, and habits. In a simple tribal social order, for instance, customs and informal rules passed through cultural evolution are sufficient to specify exchange within a consensus ideology and shared worldview. In a world of personal exchange, individuals engage in repeat dealings. In general, they have personal, direct, and tacit knowledge about the multidimensional attributes, characteristics, and features of their trading counterparts. Indeed, several cultural traditions and habits evolve to connect the exchanging parts in a dense social network, limiting dissent and opportunism by a rigid cage of norms of behavior and traditions.[61]

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[61] For instance, see North's account of what he called the challenge of Karl Polanyi (e.g., North, 1977b, 1978c). In his famous book on *The Great Transformation* (1944), Polanyi argued that reciprocity and redistribution embedded in a cage of customs, traditions, and norms constituted the most dominant allocation procedure in ancient societies (see also Polanyi, 1977). Polanyi accused standard neoclassical economic theory of committing the economicist fallacy, which consists of looking at recorded human history through the lens of an economic theory purely based on a nineteenth-century phenomenon (when impersonal market exchange expanded as a social coordination procedure). In his book, Matthijs Krul (2018) centers his critical discussion and comprehensive assessment of the Northian research program around North's attempt to provide a theoretical answer to the challenge of Karl Polanyi.

In the absence of the institutional structures that configure the market process coordination, different cultural forms of ensuring social cooperation through kinship, family, status, and hierarchy evolved. Therefore, North (1987, p. 420) writes, "while measured transaction costs in such [tribal] societies are low (although unmeasured costs of societal cooperation in tribal societies may indeed be high), their production costs are high, because specialization and division of labor are limited by the extent of the market defined by personal exchange." At the other end of the spectrum, in a world of impersonal exchange marked by a complex structure of productive interdependence and social cooperation under the division of labor and knowledge, individuals do not engage in repeating dealings (which extends both in time and space) and, in addition, they do not have personal knowledge of their counterpart.

In the impersonal exchange world that characterizes the modern extended and open society, the contractual multidimensional valued attributes and the performance of agents have to be specified since the exchange relationships occur between impersonal, strangers, and unknown individuals. In addition, without informal habits, cultural traditions, and the dense cage of norms, the enforcement of the terms of exchange is extremely difficult, onerous, and costly. This opens the door to opportunistic gains. In this world, North (1987, p. 421) continues, "resources devoted to transacting are large (although small per transaction) but the productivity associated with the gains from trade is even greater." The most relevant fact is that uncertainties associated with the exchange process are deeply present at every step. Individuals cannot rely only on informal mechanisms to ensure interdependent cooperation and social coordination.

Indeed, a wide range of formal institutional arrangements must be developed to guarantee that expected outcomes vastly remote from our personal knowledge, social network, and control are reliably manifested. A vital *sine qua non* institution to give predictability and confidence for individuals in exchange expected outcomes is the creation and development of a third party to exchanges (i.e., government) which specifies property rights and enforces contracts. Therefore, the creation and evolution of relatively impersonal courts, law systems, and a body of judicial enforcement was a paramount force in permitting the gradual development of a complex system of property rights and contracting that extends time and space (e.g., see also the famous work by North and Weingast, 1988; and Milgrom, North, and Weingast, 1990). The emergence of a third party to exchanges is a necessary condition for complex and impersonal social coordination, but it is not by any means a sufficient condition. Because of transaction costs and the inevitable

incompleteness of property rights and contracts, norms of behavior that constrain the exchange parties and give a *de facto* counterpart to formal rules are essential to complex interdependent interaction that sustains modern Western living standards and productivity.

Moreover, with economic growth derived from complex specialization, division of labor, and impersonal exchange, the tendency is that ideological diversity increases as society begins to extend itself. In North's (1984a, p. 11) view, "more resources will have to be devoted, first to defining the rules precisely, and second to enforcing those rules." The resources devoted to capturing gains of trade will tend to increase. With conflicting ideologies and views on contractual fairness, individuals will be not constrained by informal rules and norms of behavior in their self-interested opportunism. Given transaction costs, "ideological consensus or alienation is a fundamental influence upon the form of institution."

The subjective perceptions affect economic outcomes directly by individuals living up to the contractual agreements when they could defect and indirectly by individuals engaging in the collective decision political process and thus devoting resources to altering the rules when they could be free-riding. The passage from personal exchange to modern, complex impersonal exchange poses a fundamental complication to social cooperation. As North (1987, p. 421) writes, "[t]he breakdown of personal exchange is not just the breakdown of a dense communication network but is the breakdown of communities of common ideologies and of a common set of rules that all believe in." In a personal exchange, a myriad of informal institutions reduce the need for costly contractual specification and enforcement. As North (1988, p. 19) put it, in this world, "[a] handshake suffices for even complex exchange."

North (1984a, p. 11) applies this conceptual framework to interpret the economic history of the Western world, with particular emphasis on the two economic revolutions. The first economic revolution occurred ten millennia ago in the Middle East with the development of settled agriculture. It demanded more complex forms of social cooperation, notably the evolution of a set of property rights excluding non-members to economic benefits over animals and plants that, at that time, involved some form of community authority and military defense. Rising agricultural productivity led to population expansion, increasing the cost of consent and communal decision-making. The result was the creation of the state, the monopoly of coercive power and legal authority within a delimited territory that structures and enforces a body of

internal rules. Such institutions were probably not created *ex nihilo* or *de novo* but evolved from previous nomad tribal forms of norms and habits of organization.

According to North (1984a, pp. 12-3), the creation of the state "was certainly the most fundamental achievement of the ancient world." The unequal distribution of power and means of potential violence is at the core of the emergence of the state. Hence, although the "state is an essential prerequisite for capturing the gains from trade," it is also the source of intrinsic and continuous exploitation of the constituents by the dominant elite and its rulers. The unequal distribution of coercive power implies the opportunity for individuals to enforce rules according to their own utility-maximizing functions, regardless of their effects on efficiency. The property rights distribution of coercive power or violence potential matters and the development of military technology greatly impacted the forms of collective choice and state organization. North (1981, ch. 10), for instance, asserts that the military technology of the heavily armored knight and the medieval fortified castle led the way to feudalism. With the development of the pike, longbow, and gunpowder, property rights distribution of potential violence changed, paving the road to the end of feudalism.[62]

These changes in the property rights distribution of violence potential caused by varying military technology are just one of the major sources of change in relative prices and, in consequence, social change. Others have been population change and changes in the stock of knowledge. In North's (1984b, pp. 260-1) opinion, constraints throughout history basically evolve "from a change in the relative bargaining power of rulers versus constituents (or rulers versus rulers), and, broadly speaking, changes arise because of major, persistent changes in relative prices." These persistent changes led to efforts of one party to re-contract against the fundamental constitutional rules or traditional customs. In the case of rulers, there is no free rider problem. Thus, the efforts of re-contracting in favorable terms to the ruler will be more direct. In the case of constituents, there is the free rider problem for concerted collective action. Therefore, a necessary condition for re-contracting efforts is a subjective change in the fairness of the contract terms.

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[62] Margaret Levi and Douglass North (1982) make a case for a property rights theory of exploitation based on the access and distribution of the means of potential violence, thus political power. Many years later, in connection with the development of social coordination in human history, the inexorable violence potential problem was famously worked on in North's last book, co-authored with John Joseph Wallis and Barry Weingast, *Violence and Social Orders: A Conceptual Framework for Interpreting Recorded Human History* (2009).

The second economic revolution is the industrial revolution that originated in the eighteenth century and matured in the mid-nineteenth century with the wedding of the manufacturing process of mass production and scientific and technological progress. An elastic supply curve of production at a constant cost of new knowledge and efficient substitution of all margins made possible astonishing economic growth since this period. The technology was characterized by capital-intensive increasing returns, indivisibilities, and scale economies, demanding a continuous large flow of production and distribution processes. In this connection, the modern corporation is the product of a series of organizational innovations that had the purpose and effect of minimizing transaction costs in realizing the gains of the large-scale firm allied with modern technology. Transactions, specialization, and productivity grew on an exponential scale.

Nevertheless, this enormous economic growth and social welfare came with a price. As North (1984a, p. 13) put it, the price was an "enormous increase in the resources devoted to transacting and political and economic institutions that are inherently even more unstable." In an attempt to measure these transacting costs, North (1984a, p. 14) documents that "between 1900 and 1970, the United States labor force grew from 29 million to 80 million. Manual workers, however, increased only from 10 million to 29 million." White collar workers, which the great bulk is concerned with transacting, increased from 5 million to 38 million. Moreover, "the second economic revolution fostered a growing number of firms specializing in transacting from producer to consumer. These include finance, banking, insurance, auditing, accounting, etc. In addition government, also primarily concerned with transacting, grew immensely," from 1 million to 12.5 million workers in the same period.

In his influential book *The Visible Hand: The Managerial Revolution in American Business* (1977, p. 282-3), the business historian Alfred D. Chandler sustains how the organizational structures in modern corporations changed to adapt to the new technology of the second economic revolution, in particular, the integration of mass production with mass distribution (see also Williamson, 1981; North, 1981, ch. 12).

> "The changing ratio of capital to labor and of managers to labor thus helped to create pressures to integrate within a single industrial enterprise the process of mass distribution with those of mass production. By 1900 in many mass production industries the factory, works, or plant had become part of a much larger enterprise. In labor-intensive, low-level

> technology industries most enterprises still operated little more than a factory or two. But in those industries using more complex, high-volume, capital-intensive technology, enterprises had become multifunctional as well as multiunit. They had moved into marketing of the finished goods and purchasing and often the production of raw and semi-finished materials. These enterprises did more than coordinate the flow of goods through the processes of production. They administered the flow from the suppliers of raw materials through all the processes of production and distribution to the retailer or ultimate consumer."

Furthermore, in this context, North (1985b) documents how the increasing specialization within the scientific-technological revolution radically altered the demand for and supply of government in the United States. The growing problems of measuring inputs and outputs, performance, and quality control at each step in the lengthening production chain led to growing agency problems in the labor force and government bureaucracy. Indeed, technological and organizational innovations and labor-substituting capital goods were partial solutions for these rising transaction costs. Therefore, the scientific management system delineated in Taylorism attempted to control labor performance and measure individual marginal contribution in team production. A range of methods for sorting, grading, and labeling were devised to measure the multidimensional characteristics of goods, services, and contractual relationships. Many required a third-part governmental intervention, such as in defining quality standards.

Another point that North (1984a, p. 14) notes is that the technology underlying the second economic revolution involves complications of large, specific, indivisible, and fixed "capital investments that had long life and low scrap value and that required exchange relationships in contractual agreements over long periods of time." These multifaceted agency problems proliferate the gains in altering the contractual terms at strategic points and timing. In consequence, vertical and horizontal integration resulted in a manner to deal with opportunistic behavior (e.g., see North, 1981, p. 277-9). In this sense, North (1984a, p. 15) argues that "[t]he growth of the business firm was a method of internalizing unpriced benefits."

North (1984a, p. 16) delineates two major social, political, and economic consequences of the second economic revolution. The first is that complex productive specialization and impersonal social cooperation induced massive ideological alienation. This resulted in the breaking of the

social fabric of a communal ideological superstructure that legitimized the rules of the game. A myriad of new and conflicting but legitimate perceptions of reality are formed in connection with an expanding open, liberal, and cosmopolitan society. This process creates inherent political instability and group reaction against the social coordination by the market-extended institutional system. These groups overcome the collective action problem to try to control the state for their interests, reducing competitive pressures and seeking redistribution income. These radical changes altered the traditional roles of social, political, and economic institutions.

In particular, for instance, these changes were accompanied by profound alterations to the long-established functions and roles of the family and kinship relations. The demand for a replacement of these traditional roles exerted by the extended family could not be effective and realized solely by voluntary organizations because of the well-known problems of asymmetric information (leading to moral hazard and adverse selection) and free-riding in the context of non-rivalrous and non-excludable public goods. Therefore, these emerging demands for new institutional arrangements that could provide social and economic functions that were part of the customary and acceptable role of the extended family were taken, for the most part, by the state. On the other hand, the supply of state action in scale and scope was made possible by new technologies and increasing returns that lowered the costs of public goods provision and increased the efficiency of government taxation. This process led to the immense growth of the public sector in both scale and scope experienced in the Western developed countries in the twentieth century.

On a controversial note, North (1984a, pp. 16-7) concludes that all these social and political problems are not confined to a certain particular institutional architecture, such as the market-extended and commercial society. On the contrary, he maintains that these are the result of a world of specialization and division of labor molded by modern technology. Socialist societies also have to deal with the same problems of cheating, shrinking, and alienation.[63] Arguably, in fact, these are problems that civilization *per se* produced. In his well-known book *Civilization and Its Discontents* ([1930] 2010), the Austrian founder of psychoanalysis Sigmund Freud argues that there is a fundamental opposition and conflict between the individual primitive

[63] In the same way that a socialist system, or any form of social and economic coordination, has to deal with the fundamental scarcity problem imposed on every society. The formal similarity thesis of the marginal preconditions to efficient resource allocation applies to every human societal arrangement, as demonstrated long ago by early marginalists such as Friedrich von Wieser in *Natural Value* ([1889] 1893), Vilfredo Pareto (1897, 1909), and many others.

desires and civilizational demands for instinctual repression and social conformity. Along the same lines, North (1984a, p. 17) argues that "[t]he price of civilization is the growing costs of political and economic organization and the instability that has accompanied them." For North, understanding these problems within an analytical basis "is the task that confronts the modern social scientist today."

## IV. *CONTRA* THE OBJECTIVE INSTRUMENTAL RATIONALITY POSTULATE: A TRANSACTION COST APPROACH TO POLITICAL INSTITUTIONS, SHARED MENTAL MODELS, AND INSTITUTIONAL CHANGE (1989-1997)

At the end of the 1980s, Douglass North's growing analytical concerns became concentrated on a profound critical reaction to the behavioral foundations of neoclassical economic theory, particularly what he called the instrumental rationality postulate, and the integration of transaction cost and institutional analysis in the political realm of exchange towards a theory of institutional change. The development of this research program gave birth to North's most influential and cited book until today, published in 1990, *Institutions, Institutional Change, and Economic Performance* (1990a). As North (1990a, p. vii) writes in the preface, although the book builds on his earlier studies on institutions from the past twenty years, "it delves much more deeply than the earlier studies into the nature of political and economic institutions and how they change. The specification of exactly what institutions are, how they differ from organizations, and how they influence transaction and production costs is the key to much of the analysis." Moreover, as in his life-long research program, the central focus of the book "is on the problem of human cooperation, specifically the cooperation that permits economies to capture the gains from trade that were the key to Adam Smith's *The Wealth of Nations*."

In his articles "A Transaction Cost Approach to the Historical Development of Polities and Economies" (1989b) and "A Transaction Cost Theory of Politics" (1990b), North extended the transaction cost approach to the political markets, exploring the drastic implications and intrinsic connection between the development of political and economic institutions. In North's (1989b, p. 661) definition, political institutions are the rules that "broadly specify the hierarchical structure of the polity, its basic decision rules, and the explicit characteristics of agenda control." Politics is about the continuous exchange and bargaining over the rules, rights, and structure of society

and the economy. In general, political institutions determine economic institutions that, in turn, influence political institutions through the property rights structure and economic interests of the politically dominant elite. Thus, social, political, and economic institutions are in everlasting and ongoing co-evolution. In equilibrium, however, a given property rights structure will be consistent with a particular set of political institutions.[64] In the later 1950s and early 1960s, the public choice literature applied standard neoclassical economic analysis and its underlying assumptions to non-market political decision-making.

Standard rational choice models used in the study of political behavior carried the assumptions of objective instrumental rationality and efficient markets derived from the neoclassical general equilibrium framework encapsulated in the first and second fundamental theorems of welfare economics. Of course, this canonical welfare conclusion rests on several additional assumptions embodied in the standard general equilibrium model, i.e., complete markets (thus, zero transaction costs), complete knowledge, and perfect competition (defined by perfect and objective information, price-taking actors, and the absence of externalities). Incorporating the more modern rational expectations notion, North (1990b, p. 356) defines instrumental rationality as human agents having "either the correct models by which to interpret the world around them" (i.e., perfect knowledge) or receiving "information feedback that will lead them to revise and correct their initially incorrect theories. Actors and their organizations that fail to arrive at correct theories will perish in the competitive markets."

In North's (1990b, p. 356) view, one of the best illustrations of this instrumental rationality approach in treating politics is delineated in Gary S. Becker's (1983) model of political competition among pressure groups for influence. In this model, an income redistribution game occurs where subsidies provided to one special interest pressure group are financed by taxes paid by all the other groups. In the redistribution process, there are deadweight losses from taxes and subsidies, implying that the economic burden of total taxes is inclined to rise more rapidly than the benefits from subsidies. This encourages political pressure from taxpayers. Hence, the process of income redistribution will be limited to a political equilibrium that depends on the efficiency of pressure groups in producing political pressure, the effect of additional pressure on

[64] In a famous article, North (1989c) provides a historical introduction to the interdependence of political and economic institutions, examined in contrast to the standard hypotheses of neoclassical economic theory. As an example, North illustrates the precedents of American institutions to the political institutions, in particular, the evolution of common law in England. Moreover, he contrasts the decentralized political institutions that evolved in England with those developed in centralized Spain.

the group's influence, the number of people in each group, and the deadweight cost of taxes and subsidies. In his political economy model, Becker (1983) assumes that the players of this direct and explicit redistribution game have accurate knowledge of the game parameters (i.e., in this case, the source of their rising taxes and income losses) and that all players have equal access to the political decision-making process.

Of course, these hypotheses are inapplicable to real-world political markets, as Becker (1989) himself later acknowledged. In contrast with this Beckerian approach, North (1990b, p. 356) argues that real-world political markets exhibit significant transaction costs, ignorance and imperfect information of the affected parties, and unequal access to the decision-making process. As a celebrated example of a process of rent-seeking and income redistribution policy, North (1990b, p. 357) mentions Anne O. Krueger's (1988) historical study on the political economy of sugar in the United States. In her detailed analysis, Krueger (1988, p. 54) makes clear that the policies pursued by the interest groups of the sugar program became very far from the intentions of its advocates. Each new modification in the program of sugar control produced a new round of interest group pressures that contributed more to the Byzantine policies.

According to North (1990b, p. 358), the most efficient political market extant occurs in legislatures in modern political democracies. In modern representative democratic societies, a representative body of legislators reflects multiple interest groups, i.e., elected legislators reflect particular kinds of voters that have specific interests, locations, and occupations (e.g., elderly and retired people in Florida, the automobile industry in Michigan, etc). Since rational legislators have only a limited concentration in their determined interest group, no particular legislator can form a majority to pass bills that attend to the interests of his/her voters. Therefore, legislators must engage in political exchange with their peers - who possess different interests - to advance their political agendas. In their ground-breaking book *The Calculus of Consent: Logical Foundations of Constitutional Democracy* (1962), James M. Buchanan and Gordon Tullock advanced the hypothesis of vote-trading or log-rolling between legislators.

However, this approach assumed that political exchanges occurred in an environment where all the timeless agreements, objective bills, and payoffs were *ex ante* perfectly known. The standard vote-trading model assumes that the transaction costs of political exchange are zero. In contrast, North (1989b, p. 664; 1990b, p. 359) notes that political trade relations necessarily involve commitments made for a future date with highly uncertain payoffs. This fact points to the crucial

question of credible commitment that enables political exchanges in a context where payoffs are in the future and on completely different issues. North (1990a, 1990b) generalized the transaction cost argument for politics, arguing that political markets are inherently less efficient than economic markets due to the higher transaction costs of measuring and enforcing trading agreements. In contrast to traditional rational choice models in politics, North builds a transaction cost theory of political behavior based on costly information, subjective interpretations of reality, and the preponderance of imperfect measuring and enforcing problems.

In economic markets, objective multidimensional criteria (such as quantity, quality, size, weight, color, etc) measure the physical dimensions of property rights attached to goods and the performance dimensions of agents in services exchanged in the market. Impersonal judicial courts enforce and guarantee these contractual arrangements. In judging disputes, the judicial courts also measure the legal dimensions of the contractual relationships of what property rights are being exchanged to assert whether a contract has been violated, by whom, etc. In this case, with an institutional framework that secures property rights, contractual consent, and effective market price coordination, competition in product and factor markets tends to reduce transaction costs and enhance economic coordination and social welfare. In contrast, in modern democratic political markets, promises made by political actors seeking (re)election are exchanged for the votes of their constituents. A rational voter, as it is well known, has very few economic incentives to be informed on the political alternatives regarding his/her vote since the expected probability that his/her vote matters for any election (i.e., that his/her vote will be the pivotal one in deciding an election) is infinitesimal.

Indeed, if voting is facultative, rational self-interested constituents will have no incentive to vote since the economic costs will be greater than the expected benefits. The empirical fact that voters incur expected net economic costs in voting to express their beliefs in elections constitutes the so-called paradox of voting (or Downs's paradox), analyzed in Anthony Downs's pioneer book *An Economic Theory of Democracy* (1957). In political markets, North (1990a, 1990b) argues that there are no mechanisms to define, measure, and enforce political agreements or promises (i.e., to make credible commitments) in any comparable form as in economic markets. In particular, it is extremely costly to measure what is being exchanged in political trades (between constituents and legislators and legislators and agents), thus to enforce these agreements. The only form of competition in political markets in a democracy is periodic

elections, where representatives are judged and held accountable by their uninformed constituents. In North's view, these factors imply congenital high transaction costs, low competition, and widespread inefficiency in political trading relative to economic exchanges. Moreover, it drastically increases the extent of the role of ideology in shaping political choices.

According to North, reputation and self-enforcement are certainly a valuable trait in lowering these transaction costs. Nevertheless, self-enforcement is not a sufficient condition to permit these mutually beneficial exchanges to occur since the costs of measurement and enforcement make it very difficult to discover and punish defectors and free-riders. It is very costly to ascertain that a political agreement has been violated and by whom, to measure the extent of the violation and the damages to the trading parties, and enforce and punish the violator. Therefore, political institutional arrangements that enable credible commitments permitting exchanges over space and time must be devised to measure and enforce the trading agreements (for a more lengthy discussion on the problem of credible commitment, see North, 1993a). Political institutions are created to reduce uncertainty and constitute a stable structure for *ex ante* political agreements and exchanges on different issues throughout time and place. Hence, we see a complex system of committee structure consisting of formal and informal rules for organizing these political exchanges in modern democratic legislatures.

An influential study in this matter is Barry R. Weingast and William J. Marshall's article on "The Industrial Organization of Congress; or, Why Legislatures, Like Firms, Are Not Organized as Markets" (1988). Weingast and Marshall provide a theory of legislative institutions that parallels the Williamsonian new industrial organization literature accounting for the relevant preferences (in this case, representatives seeking reelection) and the relevant transaction costs involved in political exchange. They argue that legislative institutions in the United States Congress, particularly the committee system, enforce bargains among legislators and account for a more efficient non-market exchange device relative to market exchange due to the peculiar forms and related transaction costs of legislative bargaining. As Weingast and Marshall (1988, p. 157) write in their concluding remarks,

> "Instead of trading votes, legislators exchange special rights affording the holder of these rights additional influence over well-defined policy jurisdictions. This influence stems from the property rights established over the agenda mechanisms, that is, the means by

> which alternatives arise for votes. The extra influence over particular policies institutionalizes a specific pattern of trades. When the holders of seats on committees are precisely those individuals who would bid for votes on these issues in a market for votes, policy choice under the committee system parallels that under a more explicit exchange system. Because the exchange is institutionalized, it need not be renegotiated each new legislative session, and it is subject to fewer enforcement problems."

However, Weingast and Marshall's influential analysis only points out that as a result of elaborate institutional mechanisms the legislature of the federal government of the United States has relatively low transaction costs. For this reason, the United States Congress is relatively efficient in facilitating exchange agreements and making possible credible commitments in time and space. In North's view, however, the overall political markets are extremely prone to inefficiency due to higher transaction costs. North (1990b, p. 360) defines efficiency as measured by the wedge between the actual political market result and the hypothetical zero transaction cost result. An efficient political market is one "in which constituents accurately evaluate the policies pursued by competing candidates in terms of the net effect upon their well-being; only legislation (or regulation) that maximized the aggregate income of the affected parties to the exchange would be enacted; and compensation to those adversely affected would ensure that no party was injured by the action."

Therefore, an efficient political market must imply some very restricted hypotheses. First, constituents and legislators need to possess true mental models of the external world such that they accurately evaluate the gains and losses of alternative policies in political discussion. Second, legislators would have to vote in the constituents' interests and not in their own interests. The vote of legislators would have to be weighted by the net gains or losses of their constituents, permitting eventual losers to be compensated. That is, this hypothesis implies that there is no principal-agent problem between legislators and constituents. Unfortunately, these two heroic hypotheses are not present in real-world political markets. Constituents generally do not know their interests, nor do they have knowledge about the variety of issues that legislators vote on. In general, in fact, constituents are rationally ignorant or misinformed about political issues. Indeed, in *The Myth of Rational Voter: Why Democracies Choose Bad Policies* (2007),

Brian Caplan argues that voters are rationally ignorant in political matters and have systematically biased opinions in economic affairs.

Moreover, North (1990b, p. 361) argues that constituents cannot know how competing legislators will behave - and legislators cannot know how the legislation will affect directly or indirectly the constituents, nor do legislators possess true mental models and knowledge about the themes in political discussion. As he concludes, "[i]mperfect models of the complex environment that the politician (and constituent) is attempting to order, the institutional inability to get credible commitment between principal and agent (voter and legislator; legislator and implementers of policies), the high cost of information, and the low payoff to the individual constituent of acquiring information all conspire to make political markets inherently very imperfect." For this reason, except for simple, easy-to-measure, and straightforward bills, ideological stereotyping plays a substantial role in political exchanges, particularly between legislators and constituents.

When socially shared, individual subjective mental models constitute ideologies. Ideologies attempt to explain the external reality, providing a normative benchmark for what the external world ought to be. These subjective mental models are an economizing device that structures and interprets the continuous flux of informational stimuli from objective external to our inner subjective world. This organized structure exerts an extensive normative role in shaping individual preferences (e.g., to express our beliefs for some political cause, engage and convince other people to our preferred world views, etc). Potential legislators actively engage themselves in fitting into one target ideological framework and stereotypes shared by particular voters. Accordingly, North (1990b, pp. 363-4) writes that a transaction cost approach to politics must inevitably "build on two ingredients missing or slighted in rational choice models: the subjective models of the actors and the transaction costs that arise from the specific political institutions that underlie exchange in different polities."[65]

The discussion above points out one of the main characteristics of institutions, i.e., their role in promoting a stable structure for mutually beneficial exchange within a myriad of political and

[65] Indeed, as North (1993b, p. 159) contends in an article in commemoration of the twenty-five years of the journal *Public Choice* regarding the future of the public choice literature, "[t]he central task of public choice over the next twenty-five years will be a critical exploration of the behavioral assumption it employs. A dissection of the rationality assumption is essential in order to incorporate much more "realistic" assumptions to be derived from the diverse mental models that guide human decision-making." Indeed, "[i]f individuals have different theories to explain the world around them, they will make different "rational" choices. Ideas matter."

economic institutional arrangements. As North (1989b, p. 666) maintains, institutions are mainly stable throughout time because they are structured in a complex hierarchical order, each level more costly to change than the previous one. Moreover, the informal constraints composed of traditions, customs, and habits are extensions, modifications, and qualifications of the formal rules, giving the *de jure* legal institutions a *de facto* counterpart. Informal institutions are more robust and persistent than institutionalized formal rules in human societies because they are derived from beliefs and culture, being an even more relevant anchor of social stability.

Beliefs, habits of thought and behavior, and social norms are based on the evolutionary cumulative experience of society. They are formed by repeated social interaction and passed down to new generations through culture. Therefore, culture is a function of the past experiences of a group of individuals, being extremely difficult to change by government legal decrees or by mere social or legislative will. If formal rules and informal constraints are inconsistent, it generates permanent social and political instability. Institutional stability for exchanges is a necessary condition for complex human interaction. *Nonobstant*, it is not a sufficient condition for economic growth and social efficiency. Changes in formal rules are created and enforced by political institutions. The available historical evidence points out that economic growth, technical change, and rising living standards are closely associated with the rise of representative government, the rule of law, and a secure property rights system.

However, North (1994b, pp. 366-7) points out that we are still pretty much in the dark about how to build political institutions capable of creating, defining, and securing property rights and contracts. The fact that some countries experienced long-run economic stagnation or decline and others economic growth led us to the quest for a theory of institutional change and economic performance (see also North, 1989a). One paramount source for institutional change has been changes in relative prices, as North and Thomas (1973) famously illustrated in the case of the Black Death shock and the decline of feudalism in Western Europe in the fourteenth century. With a relative price change, one or both parties of the political or economic exchange relationship will try to capture perceived potential returns created by altering the contractual agreement. The relative bargaining power of the exchange parties will determine whether, when, and how the new contractual arrangement is structured and established. Another major component of institutional change is preferences. Ideas, subjective worldviews, and ideologies matter a lot for social change. According to North (1989b, p. 666), the agents of institutional and

social change are the political and economic entrepreneurs. In their utility-maximizing behavior, they alter the margin of the institutional structure of a society.

In this sense, North (1990a) conceptually distinguishes institutions and organizations. Until this point, organizations were merely treated as manifestations, expressions, or sub-types of institutions (e.g., Davis and North, 1971). Institutions are the rules of the game. Organizations are the players of the game defined by the institutional framework. They are composed of groups of individuals that share some objective function. There are economic organizations, such as firms, trade unions, cooperatives, etc; political organizations, such as political parties, legislatures, regulatory agencies, etc; and social voluntary organizations, such as clubs, voluntary associations, churches, and other religious organizations. Organizations can make three sets of choices that are not mutually exclusive. They can maximize their utility under given constraints, devote resources to altering constraints, and practice opportunistic behavior towards the established rules. Organizations continuously evolve in different forms and directions to capture potential economic returns structured by the basic institutional framework. Therefore, North revives the spirit of his early 1970s neoclassical institutional innovation model in the sense that organizations also gradually alter the institutional framework within which they operate.

Organizations modify the rules of the game indirectly by the interaction of its utility-maximizing behavior and its effects on informal institutions. In addition, organizations directly change the rules by investing resources to alter these formal institutions via collective decision-making and political processes (such as lobbying). The most important organization, in this context, is perhaps the state. In many cases, the state has the power to externally break the rigid cage of traditional and informal norms that constrain individuals by imposing some cost on these *status quo* habitual behaviors. Therefore, for example, public policies can be designed to encourage or discourage established social prejudices and norms of behavior (e.g., regarding the role and participation of women in collective decision-making by universal franchise, etc). This continuous interaction between the institutional framework, organizations, and political and economic entrepreneurs constitutes a dynamic co-evolution between the incentives that organizations and entrepreneurs face and the given institutional structure at a particular time and place.

Institutions are characterized by increasing returns and path dependence. Predominantly, changes are heavily biased in favor of the *status quo* institutional framework. As a result,

institutional change is an incremental, continuous, and gradual process. It is the culmination of the cumulative causation of millions of individual decisions made by entrepreneurs and organizations that, in the aggregate, led to modifications in the basic rules of societies. Potential short run profit opportunities faced by organizations and entrepreneurs cumulatively create and pave the long run path of institutional change. The symbiotic relations and reinforcing mechanisms between institutions and organizations shape the overall paths and streams of social, political, and economic change. The cumulative result of these social interaction processes can be defined as dynamic efficiency (in opposition to the neoclassical equilibrium-oriented allocation efficiency) in the sense that the dynamic relationship between the institutional matrix and organizations can produce flexible institutions and a path of institutional change that is favorable to economic growth, technological progress, and social welfare (see also North, 1992b).

In many instances, these long run changes are unpredictable and unintended consequences of deliberate human action. They are unintended consequences because the entrepreneurs are solely interested in capturing short run potential returns, being alien to the external consequences of their actions. They are unpredictable because individuals act in consonance with their subjective and incomplete internal constructions of external reality. Therefore, in North's (1989b, p. 667) opinion, there is a significant difference between intended and actual outcomes due to our limited capabilities to process the external world and predict the consequences of our actions. As North writes, "[t]he path of institutional change that determines the long run evolution of economies is shaped by constraints derived from the past and the (sometimes unanticipated) consequences of the innumerable incremental choices of entrepreneurs which continually modify those constraints. Path dependence means that history matters, that it is a consequence of incremental change and that it can account for the divergent paths of economies."

Standard neoclassical economic theory assumes that individual agents have a perfect and objective perception of external reality. Even when relaxing this assumption, as in the asymmetric information literature, agents still have objective descriptions and information about the real world. With objective instrumental rationality and the utility-maximizing hypothesis, human intentions in their unfolding actions are straightforwardly materialized in the actual outcomes. As North (1989a, p. 242) put it, the objective rationality assumption makes a direct and inviolable connection between individual action plans and their choices and actual outcomes,

"with no intervening dilemmas about the information or the about processing the information or deciphering the complexities of the environment." At this point, North became deeply influenced by Herbert A. Simon's theory of bounded rationality. In Simon's (1986, pp. 210-1) view,

> "If we accept values as given and consistent, if we postulate an objective description of the world as it really is, and if we assume that the decisionmaker's computational powers are unlimited, then two important consequences follow. First, we do not need to distinguish between the real world and the decisionmaker's perception of it. He or she can predict the choice that will be made by a rational decisionmaker entirely from our knowledge of the real world and without a knowledge of the decisionmaker's perceptions or modes of calculation (we do, of course, have to know his or her utility function). If on the other hand we accept the proposition that both the knowledge and the computational power of the decisionmaker are severely limited, then we must distinguish between the real world and the actor's perception of it and reasoning about it. That is to say, we must construct a theory (and test it empirically) of the processes that generate the actors' subjective representation of the decision problem he or she frames."

In standard neoclassical economic theory, agents have perfect knowledge of the external world. With zero transaction costs, efficient political and economic markets characterize economies. In the neoclassical world, institutions are unnecessary. Ideas, mental models, and ideologies are irrelevant since *ex hypothesis* agents have perfect and objective knowledge of the world, i.e., they have what North calls instrumental rationality. Therefore, the place to begin a theory of institutions is inevitably in the rejection of the instrumental rationality assumption. With transaction costs, incomplete knowledge, and limited cognitive capacity to process external informational stimuli, humans devise formal and informal institutions to structure social interaction. Ideas, mental models, and ideologies play a paramount role in the constitution of a mental procedure device for interpreting the external world and molding individual choices. This results in imperfect political and economic markets. As North writes in his 1993 Alfred Nobel Memorial Prize address "Economic Performance Through Time" (1994a, p. 362),

> "[i]t is necessary to dismantle the [instrumental] rationality assumption underlying economic theory in order to approach constructively the nature of human learning. History demonstrates that ideas, ideologies, myths, dogmas, and prejudices matter; and an understanding of the way they evolve is necessary for further progress in developing a framework to understand societal change."

In his pioneering and widely influential article "Shared Mental Models: Ideology and Institutions" (1994), co-authored with Arthur T. Denzau, North develops the concept of subjective mental models that human beings possess about the world around them. These mental models are primarily derived from culture but *pari passu* crucially constructed by individual idiosyncratic personal experiences. In addition, these models are partly acquired non-locally and non-culturally by other means, such as formal education. Indeed, culture is nothing more than the intergenerational transfer of knowledge, habits, and social norms of behavior, varying tremendously between different human societies across the globe and throughout time. Personal experience is intrinsically connected with the particular conditions of time and place, being tacitly and locally determined. Thus, it varies radically among different physical and social environments.

According to Denzau and North (1994), the initial mental architecture that structures the subjective interpretations of the varied external signals and stimuli received by our senses is genetic and, to some degree, common to all human beings. However, the subsequent development of this mental architecture is the reverberation of the individual idiosyncratic experiences and sensational stimuli throughout life. These experiences can be those received by the physical environment and those internalized by the socio-cultural linguistic environment. Our mental architecture or sensorial order is composed of classifications that gradually evolve since we were born to order and arrange the sensory perceptions we get from external stimuli and to access in our memory past analytical conclusions derived from past experiences with the external world. The conjunction of these sensorial classifications forms mental models to explain and interpret the world around us. In particular, these categories are formed to support individual action toward some desired end and the most appropriate means to achieve that goal. The mental categories and the resultant mental models that are formed are in constant evolution, reflecting new experiences and feedback from our interactions with the world.

The feedback derived from new experiences may reinforce our initial convictions (i.e., sensorial categories and mental models) or lead to some revision or modification of our initial prejudices - implying some form of learning. Individual choices are determined by subjective preferences derived from mental constructs by which humans process external informational stimuli. Therefore, the same set of external information will generate different individual subjectively rational choices. Individuals are only intendedly or subjectively rational. Players do not necessarily know the correct means to achieve their ends. Individuals continuously learn and modify their subjective mental models. In particular, individuals constantly engage in the process of adequacy between the predicted outcomes of their mental models and the *de facto* outcomes of their actions. If their predicted outcomes are not realized, if the expected outcome determined by the subjective mental model is inconsistent with the realized (to some degree objective) outcome, expectations will have to be revised. The mental models carried by individuals will have to be modified in some sense - they will learn.

The continuous evolutionary reordering process of the mental models from particular and local special-purpose categories to successively more abstract and general forms of action gives origins to what Andy Clark and Annette Karmiloff-Smith (1993) called representational redescription. This capacity to generalize particular sensorial stimuli and past experiences to the general categories of action is the source of belief systems and shared mental models (i.e., ideologies). Belief systems organize and integrate in a more or less internally consistent way explanations of the external world and natural processes. Gradually, these belief structures co-evolve into a common culture formed by habits, conventions, and norms of behavior that, in turn, are transfigured into formal institutions and social rules of conduct. These artifactual structures embody learning from past generations that are transmitted as culture into the beliefs of the present generations. The informal institutions, in particular, serve as the carriers of the artifactual structures. Therefore, they change much more slowly in time. As North (1994a, p. 363) writes, "[m]ental models are the internal representations that individual cognitive systems create to interpret the environment; institutions are the external (to the mind) mechanisms individuals create to structure and order the environment."

According to a more sophisticated instrumental rationality notion, erroneous mental models that agents possess will be corrected via an informational feedback process that punishes deviant behavior. In a repeated evolutionary process, this will lead to surviving players having the correct

models. However, this learning process does not necessarily make subjective mental models more consistent with the external objective world. As Frank H. Hahn (1987, p. 324) accurately put it, "there is a continuum of theories that agents can hold and act upon without ever encountering events which lead them to change their theories." This fact opens the door for multiple equilibrium positions between subjective mental models and one external world, explaining the persistence of infinitely diverse subjective worldviews by different individuals across societies and throughout time.

With this behavioral understanding of mental models, we arrive at North's (1993a, p. 17) five propositions on institutional change (see North, 1995). These are,

> "1. The continuous interaction between institutions and organizations in the economic setting of scarcity and hence competition is the source of institutional change. 2. Competition forces organizations to continually invest in skills and knowledge to survive. The kinds of skills and knowledge individuals and their organizations acquire will shape evolving perceptions about opportunities and hence choices that will incrementally alter institutions. 3. The institutional framework provides the incentives that dictate the kinds of skills and knowledge perceived to have the maximum payoff. 4. Perceptions are derived from the mental constructs of the players. 5. The economies of scope, complementarities, and network externalities of an institutional matrix make institutional change overwhelmingly incremental and path-dependent."

In North's (1994a, p. 384) vision, religion was the most comprehensive form of belief system throughout history, "although they have shared the stage with less comprehensive ideologies and in the modern world they have shared the stage with secular belief systems such as communism." In reinterpreting the Great Enrichment process in Western Europe in the eighteenth century, North (1994a, p. 387; 1994b, p. 365) argues that it was a result of the construction of a gradually evolving belief system in the context of dynamic "competition among fragmented political bodies that resulted in an especially creative environment." Although politically fragmented, the national states in Europe were "integrated in having both a common belief structure derived from Christendom, and information and transportation connections that resulted in scientific, technological, and artistic developments in one part spreading rapidly throughout Europe." Thus,

political competition became the underlying force of social change. Competition among nation-states produced different results in different institutional contexts, leading the Netherlands and England to pursue a path to economic growth and Spain to pursue a path to economic decline. This historical argument is more extensively developed in Part III on "Economic Performance" of *Institutions, Institutional Change and Economic Performance* (1990a) and in North's 1994 article on "The Historical Evolution of Polities" (1994a).

## V. COGNITION, INSTITUTIONS, AND THE PROCESS OF ECONOMIC CHANGE (1997-2005)

According to North, the interaction between institutions and organizations shapes the path of institutional change in human societies. The competition between a myriad of social, political, and economic organizations determines the rate of institutional change. However, the direction of social change is a function of the subjective perceptions and mental models of the individual entrepreneurs who command organizations. Therefore, the most fundamental long-run source of institutional change is the cognitive learning process by individuals and entrepreneurs since the beliefs of individuals, groups, organizations, and societies determine their choices and shape how economies evolve across space and throughout time. The analytical incorporation of beliefs involves the cognitive investigation of how people subjectively learn, model, and update the internal mental representations of the objective environment they are inserted into. Hence, to understand the process of social and economic change, we must investigate how our brain structure and cognitive architecture derived from biological evolution are linked to mental phenomena and observable behavior.

In his reminiscences, North (1997a, p. 263) writes that it was in his 1990 book that he "began to puzzle seriously about the rationality postulate." In this context, he continues, one simply cannot get a theoretical understanding of subjective preferences, ideologies, ideas, myths, and mental models "without digging deeply into cognitive science in attempting to understand the way in which the mind acquires learning and makes choices. Since 1990 my research has been directed toward dealing with this issue." Indeed, in his path-breaking article on "Shared Mental Models" (1993), co-authored with Denzau, North made his first major step in dealing with the intricate cognitive foundations of beliefs and human learning. This theme began to take more and more of

North's intellectual attention and analytical developments in the second half of the 1990s and first half of the 2000s, culminating in the publishing of his 2005 celebrated book *Understanding the Process of Economic Change* (2005). In this work, North develops a cognitive and institutional approach to economic change to explain the different performances of economies. As North (2005, p. viii) put it in the book preface, "[t]he underlying source of this [institutional] persistence had to be features of the human environment and of the ways humans interpret that environment. What I did not consider in earlier studies was the character of societal change and the way humans understand and act upon that understanding of societal change."

Indeed, in North's (2005, ch. 4) vision, in contrast to the Darwinian theory of biological evolution, the human evolutionary change in history rests on the purposefulness and intentionality of human action. Human action unfolds under the intentionality of pursuing some defined goals and ends according to a mental description of the causal chains of the world. In this sense, the process of social evolution is shaped by human decision-making which are deliberated choices reflecting the subjective internal perceptions of the agents of change. Therefore, for the most part, social and economic change is a deliberate process of millions of human actions shaped by the internal perceptions of the agents regarding the consequences of their actions. Economic change is the result of human action - although it is not a complete product of human design and deliberation. To understand economic change, we must understand how humans come to interpret their environment and how they learn and change their mental constructs derived from personal, social, and cultural experiences. We can divide human learning into two different but intertwined dimensions, individual and collective learning. In both instances, we have the interplay between the genetic cognitive mental architecture and the evolving physical environment and social, cultural, and linguistic conditions created deliberately by humans to order their physical surroundings.

At this point, North (2005, ch. 3) adopts his pragmatic notion of mental models defined as complex, plastic, and flexible neural structures that gradually evolve to organize our perceptions received by the senses and keep track of our memories. With neuroplasticity, the ability of neurons and neural networks in the brain to change their connections and organizations in response to new informational stimuli, the mental architecture constitutes pragmatic responses to the problems humans are confronted with to interpret and act toward some problem-solving goal. The mental models are the final prediction or expectations the mind makes regarding the

physical environment and its causality relations before it can receive any response feedback from the external world. To some degree, the environmental feedback will validate or invalidate the *ex ante* subjective expectations created by the individual agent. In this process, the initial mental model will have to be revised, refined, or entirely replaced. Therefore, individual learning is the complex modification process of mental models according to the feedback received from the environment.

This complex individual learning procedure is accompanied *pari passu* by the representational redescription process, where particular solutions to specific problems are reordered and generalized as a comprehensive problem-solving model for other applicable circumstances. Thus, individual learning is an evolutionary process of trial and error in testing solutions to particular problems confronted by individuals in their physical environment. This learning process does not necessarily lead to finding, filtering, or discovering correct or true mental models because the environment and the problems confronted are constantly evolving and changing. As Denzau and North (1994, p. 16) write, "[i]ndividuals act on incomplete information and with subjectively derived models that are frequently *erroneous*, the information feedback is typically insufficient to correct these subjective models." Thus, individual actors will disagree over what is the subjectively rational action in the face of the same evidence presented. On this point, in the later 1990s and early 2000s, we should note that North gradually distances himself from his earlier emphasis on bounded rationality derived from Herbert Simon's theory toward a view similar to the Austrian economist and social philosopher Friedrich A. von Hayek and its remarkable resonances with modern cognitive science work (e.g., see North, 2005, pp. 32-33). In North's (1997a, pp. 263-4) view, "Simon was the pioneer who attempted to persuade social scientists to examine the actor's subjective perception of the world."

Since the epoch-making book *Administrative Behavior: A Study of Decision-Making Processes in Administrative Organization* (1947), based on his Ph.D. dissertation in Political Science at the University of Chicago, Simon argued that both human knowledge and computational power are severely limited. Under these conditions, rational decision-making processes will be grounded in cognitive heuristics in which the choice will be redeemed as satisfactory rather than optimal. As Simon put it in his "Rational Choice and the Structure of the Environment" (1956, p. 129), the article that introduced the term satisficing, "[e]vidently, organisms adapt well enough to 'satisfice'; they do not, in general, 'optimize.'" Thus, Simon's emphasis is more on the

limitations of the computational power of processing information in human decision-making. In contrast, North (1997a, pp. 263-4) writes that his "concern with ideologies focused more on the information available to the actor and the imperfect feedback that the actor received as a result of the choices he/she made."

In chapter 3 of *Understanding* on "Beliefs, Culture, and Cognitive Science," North (2005, pp. 32-33) maintains that "[t]he place to begin to build an integrated approach" to the cognitive foundations of beliefs and culture "is with an acknowledgment of Friedrich Hayek, whose book *The Sensory Order* (1952) pioneered in developing an understanding of the process of learning and the formation of beliefs long before cognitive scientists had developed connectionist theory. For Hayek beliefs are a construction of the mind as interpreted by the senses. We do not reproduce reality; rather we construct systems of classifications to interpret the external environment." Indeed, in his first academic article written as a student in 1920 and developed more than thirty years later in his 1952 theoretical psychology book, Hayek anticipated the Canadian psychologist Donald O. Hebb's contributions to the neuronal and synaptic plasticity model of learning and memory (see Hayek, 1952, pp. v-vi). In *The Sensory Order: An Inquiry into the Foundations of Theoretical Psychology* (1952), Hayek describes the brain as a complex hierarchical and adaptive system of self-classification of the senses that generates a spontaneous sensory order, in contrast with the external natural order. In an interview, North emphatically acknowledges that Hayek "is the most important social scientist of modern times," adding that Adam Smith, David Hume, and Hayek "have been enormously influential in the way I've evolved" (Kling and Schultz, 2009, p. 155).

When the environmental feedback confirms to some degree the same *ex ante* subjective expectations a sufficient number of times, this mental model is stabilized and crystallized. A relatively crystallized mental model is called a belief - and the interconnection of beliefs, which can be either consistent or inconsistent with each other, is a belief system. In Mantzavino, North, and Shariq's (2004, p. 76) words, "the belief system is progressively shaped by the involvement of a parallel emotional adaptation, and it therefore takes on the character of a general filter for all new stimulus processing, so one may safely hypothesize that it is relatively resistant to abrupt changes." In turn, collective or shared learning occurs in two distinctive forms. In static learning, the repeated communications between individuals in a given social and cultural environment give origin to the formation of shared mental models, i.e., a common and shared mental

architecture to interpret the environment and solve collective problems such as the fundamental economic problem imposed by scarcity. Thus, this shared mental architecture provides a common interpretation of physical reality that is the foundation and the *sine qua non* condition of human interaction, division of labor and knowledge, and social cooperation.

In evolutionary collective learning, the formation and unfolding of shared mental models first occurs in social organizations such as families, schools, etc. In a social sphere, the process of discovering, storing, and transmitting knowledge across generations and throughout time is embodied in cultural evolution. For instance, as the external symbolic storage of past knowledge in cultural expressions, social conventions and norms, and moral rules. The recording of ideas and events in an external and public medium artifact made possible the transmission and accumulation of theoretical-scientific and practical knowledge utilizing natural and artificial symbols across generations. In North's (2005, p. vii) opinion,

> "Culture not only determines societal performance at a moment of time but, through the way in which its scaffolding constrains the players, contributes to the process of change through time. The focus of our attention, therefore, must be on human learning - on what is learned and how it is shared among the members of society and on the incremental process by which the beliefs and preferences change, and on the way in which they shape the performance of economies through time. Part of the scaffolding humans erect is an evolutionary consequence of successful mutations and is therefore a part of the genetic architecture of humans, such as innate cooperation within small interacting groups; part is a consequence of cultural evolution such as the development of institutions to favor larger group cooperation. Just what is the mix between the genetic architecture and the cultural heritage is in dispute."

In this context, collective learning encompasses the spontaneous emergence of informal institutions in a process of innovation and imitation. In North's (2005, p. 42) view, "[i]nformal norms develop that blend the moral inference of genetic origin with the intentional aims of humans, which together provide the backbone of what we should mean by the term culture." From an internal and cognitive point of view, as Mantzavino, North, and Shariq (2004, p. 77) write, informal institutions "are nothing more than shared mental models or shared solutions to

recurrent problems of social interaction. Only because institutions are anchored in people's minds do they ever become behaviorally relevant. The elucidation of the internal aspect is the crucial step in adequately explaining the emergence, evolution, and effects of institutions; it is this that makes for the qualitative difference between a cognitive approach to institutions and other approaches." Informal institutions emerge as an internal or endogenous process within a social environment that shares conventions, moral rules, and social norms of behavior. In contrast, formal institutions are imposed externally as an exogenously generated product of the state and its rulers.

Therefore, the process of social and economic change is encapsulated in the following feedback evolutionary scheme: external world and physical "reality" > beliefs > informal and formal institutions > specific policies > outcomes (and, thus, altered "reality"). We should note that the feedback mechanism from outcomes and altered reality to our mind is very far from a direct correction mechanism since we have an extremely limited knowledge of these complex environmental interactions and necessarily interpret the outcomes according to our highly imperfect mental models. Moreover, physical reality and its underlying conditional challenges are constantly changing in a non-ergodic and uncertain world. As North (1997a, p. 264) writes, "[c]ollective learning, according to Hayek, consists of those experiences that have passed the slow test of time and are embodied in our language, institutions, technology, and ways of doing things. The accumulated stock of knowledge of past experiences is built into our learning and is the deep underlying source of path dependence - the powerful influence of the past on the present and future. Learning then is an incremental process filtered by the culture of a society that determines the perceived pay-offs, but there is no guarantee that the cumulative past experiences of a society will necessarily fit them to solve new problems."

The relatively inflexible shared beliefs system is the source of cognitive path dependence, shaping institutions that are also path dependent. Hence, it also generates the economic path dependence that characterized human recorded history. The immense variation of the economic performance of different societies is a function of the complex processes of shared collective learning based on internal mental models or shared knowledge and the formal external institutions or scaffoldings that are erected in synergism with those cognitive structures and informal rules of behavior. In particular, North (2005, pp. 69-70) emphasizes the importance of adaptive efficiency of the institutional matrix, or what he called artifactual frameworks, as

relatively flexible collective cognitive learning devices to survive in ever-changing circumstances derived from the radical uncertainty of a non-ergodic world.

> "Successful economic development will occur when the belief system that has evolved has created a 'favorable' artifactual structure that can confront the novel experiences that the individual and society face and resolve positively the novel dilemmas. Failures will occur when the novel experiences are so far removed from the artifactual structure of the evolved belief system that individual and society do not have the 'building blocks' of the mind and artifactual structure to resolve the novel problems. If we are going to come to grips with an understanding of the differential performance of different parts of the world both over time and cross-sectionally in the modern world it is here that we must begin. Put it simply the richer the artifactual structure the more likely are we to confront novel problems successfully. That is what is meant by adaptive efficiency; creating the necessary artifactual structure is an essential goal of economic policy."

## VI. EPILOGUE

In the 1990s, Douglass C. North gradually evolved from his emphasis on bounded rationality derived from Herbert Simon to a view associated with the modern connectionist approach in cognitive psychology. The connectionist model understands human knowledge as encoded and distributed by the neural connections among representations stored in the brain, made by neurons and neural networks. These flexible neural networks are activated by external stimuli received by the five senses that humans utilize to perceive the world, making the neural connections more structured and resilient. Indeed, this cognitive property is in the foundation of neuronal and synaptic plasticity models of human learning and memory, advanced and worked on by Friedrich A. Hayek in his book *The Sensory Order* (1952). The human computation power aspect stressed by Simon's theory of bounded rationality has put a primary emphasis on the cognitive process at the individual level. Therefore, standard psychological research on rational decision-making, such as famously and widely expressed in modern behavioral economics, focuses on the behavior of individuals isolated from the cultural and institutional context.

In this sense, individual rationality is essentially divorced from the social context. Hence, this literature judges the rationality of individual decisions compared to a theoretically constructed objective rationality concept of neoclassical economic theory. According to Jack Knight and Douglass North (1997, p. 218), in this approach, "[t]he definition of rationality is theoretically derived independent of social context; cognition is assessed in terms of the ability of the mind to assimilate the information *correctly* (as defined by the outside observer). Given its lack of attention to the role of social context in the cognitive process, there is little that this research alone can tell us about the specific role of social institutions and cultural heritage in the cognitive process." They argue that a more productive, integrative, and complex way to understand the interplay between cognition and institutions is to start with the observation that much of the so-called individual rational decision-making is "the product of beliefs that are instantiated in social institutions and other cultural symbols."

As the cognitive anthropologist Edwin Hutchins put it in his book *Cognition in the Wild* (1995, p. 354), "culture, context, and history [...] are fundamental aspects of human cognition and cannot be comfortably integrated into a perspective that privileges abstract properties of isolated individual minds." In the 1990s, Hutchins developed the approach of distributed cognition processes in which, in a very fundamental sense, human cognition is a cultural and social process expressed in external artifacts and cultural systems for interpreting reality. Thus, this cognitive approach views human cognition as an interactive and intertwined process involving internal individual mind dynamics and external physical and cultural artifacts (see also North, 2005, pp. 33-37). This process reverberates in North's emphasis on adaptive efficiency and how societies are capable of constructing into an institutional framework what Vernon L. Smith (2003) called ecological rationality, that is, a flexible external artifact that is capable of adapting to the everlasting changes that are occurring in our non-ergodic world, permitting innovations, trials, and errors, and eliminating those new institutions and organizations that do not work.

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