

International Cooperation and Competitiveness on a Regional Level: Theoretical Overview

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要 旨

グローバル化とローカル化が生み出した地域レベルの国際関係は、国際協力と競争関係からなる。地域レベルの複雑な関係を説明できる理論を構築する必要がある。そのため、本論文では、国際競争力と国際競争を扱うさまざまな理論を検討する。

Keywords: cooperation, competition, competitiveness, game theory

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I. Introduction

Two tendencies leading the evolution of world political and economical order – globalisation and regionalisation (or localisation) - have been at the center of much political and economic debate in recent years. They are dialectically opposite sides of the same contradictory tendency – the increasing interdependence of the modern world. As a result, most countries are both integrating with the world

economy and devolving power to local governments and communities. Slowly but steadily regions are emerging as new actors of international interactions, taking a place between macro-, or nation-state, level, and micro-, or company level.

In their interactions these new actors meet an old choice of options: they can either cooperate, or compete, or ignore other actors, as a rule, regions of the same level, just like the actors do. However, it should be noted that cooperation and competition are another pair of dialectically united opposites. Current political and economic ideas about competition and cooperation are rooted in those two modes of human behavior that, to some extent, have shaped all of the world's cultures. All societies seek the right blend of cooperation and competition. In fact, no society has ever been entirely one or the other. Wherever there is a scarce resource there is competition and wherever two or more people work together to get that scarce resource, there is cooperation.¹ Competition and cooperation exist together in any environment. It is their interaction that forms the economic structures we observe. Human societies must balance these two modes of operation if they hope to achieve some level of political and economic stability.²

In research of international relations on a regional level the first thing needed is a theory. Because cooperation and competition are so widespread in society, a considerable research has been done on both of those phenomena. However, the economical and political theories of interactions on the regional level are yet to be developed. Since it is obvious that regional level resembles more a mini-state than a big company, we shall instead review the evolution of cooperation and competitiveness theory on the macro-level. We start with competitiveness theory developing from classical trade theories. The research on competitiveness is in advanced position comparing to the cooperation theory, first, because it has started centuries ago, and second, because the limits of research were kept relatively narrow. In contrast, the cooperation theory has not evolved till the middle of the last century; however, the research has been made in most abstract terms: the cooperation theory can be applied virtually to any system, from an ecosystem to international relations.

II. Competitiveness theories

1. Evolution of competitiveness theory from trade theory

International business became important in the era of discovery and exploitation during the 15th century. Mercantilism, which was the main economic theory at that time, emphasized the necessity of a country to

acquire an abundance of precious metals. To do this, the country had to export the maximum of its own manufactures and to import the minimum from other countries. Mercantilism viewed trade as a zero-sum game in which a trade surplus of one country is offset by a trade deficit of another country.

In contrast, Adam Smith (1723-90) viewed trade as a positive-sum game in which all trading partners can benefit if countries specialize in the production of goods in which they have absolute advantages. Specifically, the advantage comes from the division of labor. Smith extended this idea to that of “international division of labor”. Competition was important, because it assured that each person and nation would do what they were best fitted to do, mutually rewarding their services and maximally contributing to the common good.

Ricardo extended absolute advantage theory to comparative advantage theory. According to Ricardo, even if a country does not have an absolute advantage in any good, this country and other countries would still benefit from the international trade. However, Ricardo did not satisfactorily explain why comparative advantages are different between countries.

Heckscher and Ohlin explained that comparative advantage arises from difference in factor endowments. According to their model, there are two basic characteristics of countries and products. Countries differ from each other according to the factors of production they possess. Goods differ from each other according to the factors that are required in their production. A country will have comparative advantage in, and therefore will export, that good whose production is relatively intensive in the factor with which that country is relatively well endowed.

This model has been expanded by three important theorems.

The factor price equalization theorem states that free trade will equalize factors of production between countries under some conditions, namely no transportation costs, no trade barriers, and identical technology. Two important conclusions can be derived. First, with formation of a trading bloc, the country of low income will benefit more than the country of high income. Second, a less developed country should actively pursue an open door policy to increase its income level.

The Stolper-Samuelson theorem links international trade to the domestic distribution of income. Free trade benefits the abundant factor and harms the scarce factor.

The Rybczynski theorem says that at constant prices, an increase in one factor endowment will increase by a greater proportion the output of the good intensive in that factor and reduce the output of the other.

The Heckscher-Ohlin model is simple, logical, makes common sense, and appears to be virtually

self-evident. However, the famous empirical study conducted by Leontief proved the opposite. Many economists, including Leontief, have attempted to explain the paradox or to develop alternative theories of international trade. These theories include product cycle, country similarity, and trade based on economies of scale.

Raymond Vernon argued that many manufactured goods go through a product cycle of introduction, growth, maturity, and decline. Thus, comparative advantages of these goods shift over time from one country to another.

Staffan Linder's country similarity theory explains international trade among countries that have similar characteristics. The theory has two assumptions. First, a country exports those manufactured products for which there is a significant home market. Manufacturers introduce new products in order to serve the domestic market because they are familiar with the market. Production must be large enough for firms to achieve the economies of scale and thus to reduce costs. Second, the country exports the product to other countries with similar tastes and income levels. The theoretical contribution of the model is its identification of two important variables – domestic demand and economies of scale – in explaining different types of international trade.

The economies of scale model focuses on production side. Economies of scale, or increasing returns, means, that if inputs were doubled, output would be more than doubled. If there are economies of scale, countries would benefit if they specialize in the production of a limited range of goods. Economies of scale and international trade make it possible for each country to produce goods more efficiently without sacrificing of variety of goods.³

Although all those theories could partially explain the Leontief paradox, no explanation in terms of classical competitiveness theory was good enough.

2. New competitiveness theory

To investigate why nations gain competitive advantage in particular industries and the implications for company strategy and national economies, Michael Porter conducted a four-year study on ten important trading nations. Porter defined a nation's industry as internationally successful if it possessed competitive advantage relative to the best worldwide competitors. As the best indicators he chose the presence of substantial and sustained exports and/or significant outbound foreign investment based on skills and assets

created in the home country. Porter concluded that nations succeed in particular industries because their home environment is the most forward-looking, dynamic and challenging. Specifically, the determinants are factor conditions; demand conditions; related and supporting industries; and firm strategy, structure, and rivalry. In addition, there are two outside variables: government and chance.

Porter criticized the traditional doctrine. According to Porter, national prosperity is created, not inherited. Porter model is thus dynamic. Porter model is also comprehensive because it includes not just factor conditions, as most traditional models do, but also other important variables simultaneously. In his “The competitive advantage of nations” Porter says:

A nation’s competitiveness depends on the capacity of its industry to innovate and upgrade. Companies gain advantage against the world’s best competitors, because of pressure and challenge. They benefit from having strong domestic rivals, aggressive home-based suppliers, and demanding local customers.

In a world of increasingly global competition, nations have become more, not less, important. As the basis of competition has shifted more and more to the creation and assimilation of knowledge, the role of nation has grown. Competitive advantage is created and sustained through a highly localized process. Differences in national values, culture, economic structures, institutions, and histories all contribute to competitive success. There are striking differences in the patterns of competitiveness in every country; no nation can or will be competitive in every or even most industries. Ultimately, nations succeed in particular industries, because their home environment is the most forward-looking, dynamic, and challenging.⁴

According to Porter, four attributes of a nation create the national environment in which companies are born and learn how to compete, as shown in Figure 1:

1. Factor conditions. The nation’s positions in factors of production, such as skilled labor or infrastructure, necessary to compete in a given industry.
2. Demand conditions. The nature of home-market demand for the industry’s product or service.
3. Related and supporting industries. The presence or absence in the nation of supplier industries and other related industries that are internationally competitive.
4. Firm strategy, structure, and rivalry. The conditions in the nation governing how companies are created, organized, and managed, as well as the nature of domestic rivalry.

Each point of the diamond – and the diamond as a system – affects essential ingredients for achieving

international competitive success.⁵

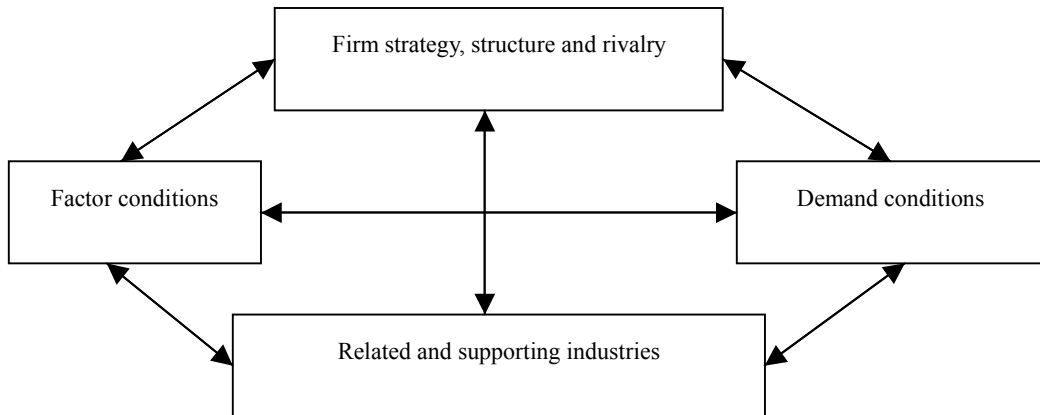


Figure 1. Determinants of national competitiveness. Source: Dong-Sung Cho, Hwy-Chang Moon. From Adam Smith to Michael Porter: evolution of competitiveness theory. 2000 P. 61

Since Porter published his book in 1990, debates have continued over the diamond model and its application in the real world. Rugman maintained that Porter’s single diamond has two flaws. First, multinational activity is not incorporated. Second, the government’s role is understated. Porter’s single diamond model has been extended to the double diamond model (Rugman and D’Cruz), the generalized double diamond model (Moon, Rugman and Verbeke) and the nine-factor model (Cho).

The generalized double diamond model (Moon, Rugman and Verbeke, 1998)

In additions to Porter’s four points of diamond, this model incorporates multinational activity and government (Figure 2).

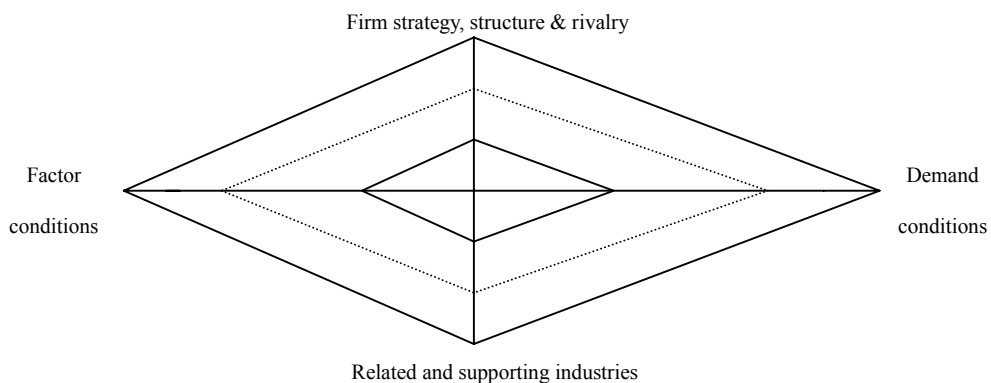


Figure 2. The generalized double diamond. Source: Dong-Sung Cho, Hwy-Chang Moon. From Adam Smith to Michael Porter: evolution of competitiveness theory. 2000. P. 116

In considering multinational activity two elements were emphasized. First, sustainable value added in a country results from both domestically owned and foreign owned firms. Second, sustainability requires a value added configuration spread over many countries. Thus, multinational activity, whether inbound or outbound, is important for a nation's competitiveness. Since multinational activity affects all the determinants of the diamond, this variable is incorporated by doubling the diamond.

The nine-factor model (Cho, 1994)

Cho emphasizes different groups of human factors and different types of physical factors (Figure 3).

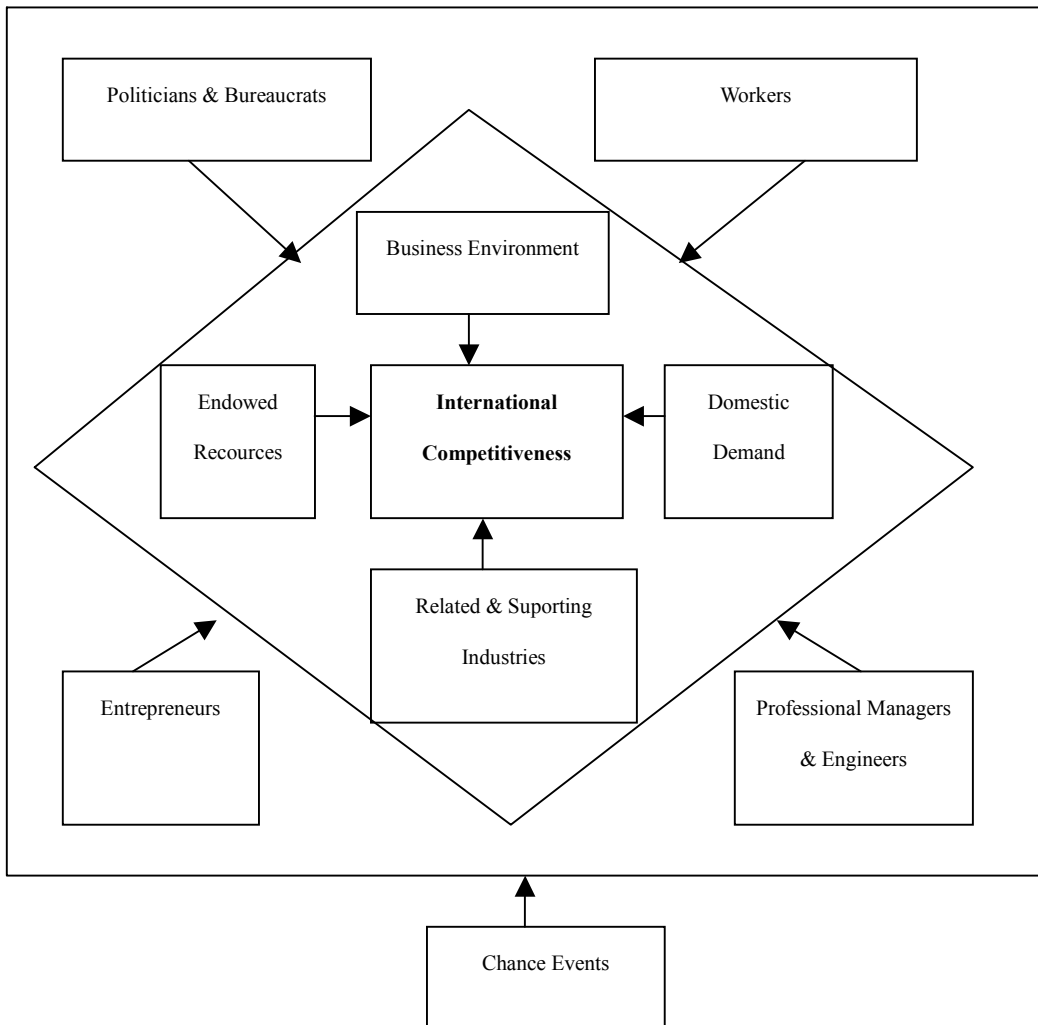


Figure 3. The nine factor model. Source: Dong-Sung Cho, Hwv-Chang Moon. From Adam Smith to Michael Porter: evolution of competitiveness theory. 2000. P. 143

Human factors include workers, politicians/bureaucrats, entrepreneurs, and professionals. Physical factors include endowed resources, domestic demand, related and supporting industries, and other business environment. An external factor, chance, is added to these eight internal factors to make a new paradigm.⁶

Although the competitiveness models mentioned above have been developed for nation-states, it is relatively easy to adapt them to a regional level, independently on what size the region in question is. It becomes possible then to analyze how international cooperation could influence regional competitiveness by affecting one or several competitiveness factor. However, it is not so easy to do, due to certain abstractness and pluralism of opinions in cooperation theory.

III. Cooperation theory

1. General cooperation theory

Cooperation is not purely an economical or political term. Cooperation exists in all natural systems. What unites the research on cooperation in different fields is that this research focuses on the systemic level of analysis, that is, on the sources of and constraints on cooperative behavior. Game theory is mostly used as the central tool of analysis.

The recent literature on international cooperation has made two general contributions. First, there is now a consensus on a definition of cooperation, which can help distinguish what behavior counts as cooperation. Second, the literature has developed propositions about the conditions under which cooperation is likely to emerge, by using game theory to model relations at the systemic level.

Following Robert Keohane, a number of scholars have defined cooperation as occurring “when actors adjust their behavior to the actual or anticipated preferences of others, through a process of policy coordination.”⁷ This conception of cooperation consists of two important elements: (1) it assumes that each actor’s behavior is directed toward some goal(s); (2) cooperation provides the actors with gains or rewards.

Cooperation is usually opposed to competition or conflict, which implies goal-seeking behavior that strives to reduce the gains available to others. However, there are other alternatives to cooperation, e.g. unilateral behavior, in which actors do not take account of the effects of their actions on others, or inactivity. Although such behaviors may not attempt to lower the gains of others, they can be considered uncooperative if they do not reduce the negative consequences for others.⁸

S. Franklin offers a typology of cooperation (see Figure 4)—placing it in the context of multi-agent systems and then defining specific types of cooperation.

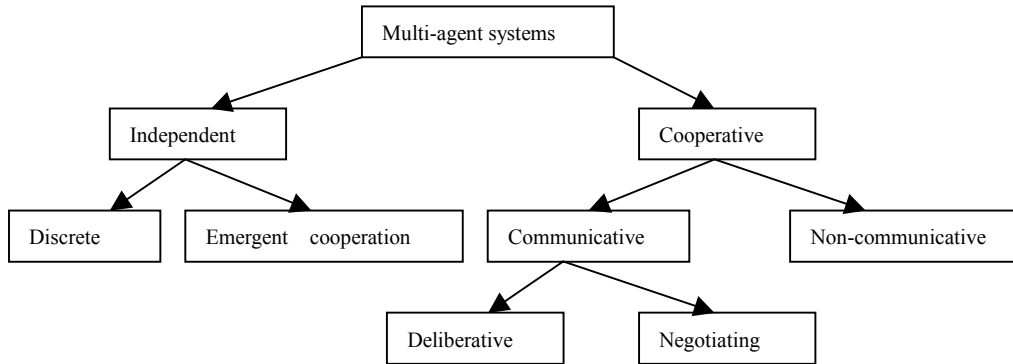


Figure 4. Cooperation typology. Source: J. E. Doran, S. Franklin, N. R. Jennings, T. J. Norman. On cooperation in multi-agent systems. www.csd.abdn.ac.uk/~tnorman/publications/ker1997.pdf

A multi-agent system is independent if each agent pursues its own agenda independently of the others. A multi-agent system is discrete if it is independent, and if the agendas of the agents bear no relation to one another. Discrete systems involve no cooperation. The complement of independent systems are systems in which the agendas of the agents include cooperating with other agents in the system in some way (cooperative systems). Such cooperation can either be communicative in that the agents communicate with each other in order to cooperate or it can be non-communicative. In the latter case, agents coordinate their cooperative activity by each observing and reacting to the behavior of the other. Intentional communication can take at least two forms—agents can deliberate or they can negotiate. In deliberative systems agents jointly plan their actions so as to cooperate with each other. Such cooperation may, or may not, entail coordination. Negotiating systems are like deliberative systems, except that they have an added dose of competition.

It is clear that definitions of basic social phenomena are important for research. While it is unlikely that universally acceptable definitions will emerge in the future, the need for precise formulations and consistent use of basic terms exists. What may emerge in this field are definitions of a number of different types of cooperation, rather than one all embracing definition. In this case, only when all the definitions are taken together can the full range of phenomena, which come under the umbrella of cooperative problem solving, be defined. Once reasonable definitions and perspectives are in place, the next stage of the debate is to identify the types of mechanisms, which need to be present within the agents to deliver desirable cooperation. Such

mechanisms need to indicate when cooperation is appropriate, what forms of cooperation are appropriate in what circumstances, and how the agents should act in the given social context to benefit most from the potential of cooperative problem solving.⁹

In the book “The evolution of cooperation” (1984) Robert Axelrod formulates the general Cooperation Theory. According to Axelrod, the basic problem that Cooperation Theory addresses is the common tension between what is good for the individual actor in the short run, and what is good for the group in the long run. In particular, Cooperation Theory has three central theoretical questions:

1. Under what conditions can cooperation emerge and be sustained among actors who are egoists?
2. What advice can be offered to a player in a given setting about the best strategy to use?
3. What advice can be offered to reformers who want to alter the very terms of the interaction so as to promote the emergence of cooperation?¹⁰

Answering to the first question, Axelrod comes to the conclusion that under condition that individuals have a sufficiently large chance to meet again cooperation can get started even in a world of unconditional defection. However, the development cannot take place if it is tried only by scattered individuals who have virtually no chance to interact with each other.¹¹ Axelrod’s comments on virtual inevitability of international cooperation are remarkable:

Fortunately, friendship is not necessary for cooperation to evolve. Even antagonists can learn to develop cooperation based upon reciprocity. The requirement for the relationship is not friendship but durability. The good thing about international relations is that the major powers can be quite certain they will be interacting with each other year after year. Their relationship may not always be mutually rewarding, but it is durable. Therefore, next year’s interactions should cast a large shadow on this year’s choices, and cooperation has a good chance to evolve eventually.¹²

Doran argues that the characteristics of an agent population and its goals, as well as the population’s environment, identifies the optimal patterns of cooperation and the type of cooperation engendering processes the agents should best incorporate to achieve it.¹³

According to Helen Milner, cooperation can be achieved in a number of ways.

- (1) It can be tacit and occur without communication or explicit agreement. In this case cooperative behavior emerges as the expectations of the actors converge.
- (2) Cooperation can also be negotiated in an explicit bargaining process.
- (3) Finally, cooperation can be imposed. The stronger party in a relationship can force the other side to

alter its policies. If the stronger party also adjusts its own policies and attempts to realize mutual gains, cooperation has occurred. Some versions of hegemonic stability theory explain cooperation in these terms. The joint gain in such a situation need not be equal. In any case, the definition of cooperation itself says nothing about how the mutual gains from cooperation will be distributed.¹⁴

Doran finds that patterns of cooperative actions can arise from the following processes.

- Reflex. Agents simply act. Therefore when cooperation occurs it does so without reflection upon possible actions. There is no prediction or predictive planning and therefore no intention (Steels, 1990). Hence cooperation is “emergent”.

- Deliberative. Agents reflect upon the combinations of actions they and others might perform. They are given some means to choose, in principle, between different combinations of action, possibly after some process of negotiation, which lead to a convergence of their behavior.

- Concept based. Agents are designed to maintain an explicit concept of cooperation, which the agent uses to help select its actions and plans, and which itself may be modified in the light of experience and also may be passed between agents. Such an agent may decide to cooperate prior to any particular set of actions being considered.¹⁵

According to Axelrod, the actual process of evolution of cooperation can be influenced by four factors: labels, reputation, regulation, and territoriality. A label is a fixed characteristic of a player, which can be observed by the other player. It can give rise to stable forms of stereotyping and status hierarchies. The reputation of a player is malleable and comes into being when another player has information about the strategy that the first one has employed with other players. Regulation is a relationship between a government and the governed. Governments cannot rule only through deterrence, but must instead achieve the voluntary compliance of the majority of the governed. Finally, territoriality occurs when players interact with their neighbors rather than with just anyone. Hence their success depends in large part on how well they do in their interactions with their neighbors. However, neighbors can also provide a role model. If the neighbor is doing well, the behavior of the neighbor can be imitated. In this way successful strategies can spread from neighbor to neighbor.¹⁶

The answer for the question about the best strategy is reciprocity. According to Keohane, reciprocity “refers to a pattern of interaction in which the actions of each party are contingent of the prior actions of the others in such a way that good is returned for good, and bad for bad. Fear or reprisal, or at least the loss of a flow of benefits from the commitment, is the key mechanism by which reciprocity leads states to maintain

commitments that would otherwise be more burdensome to keep than to reject”.¹⁷ Axelrod argues, that “a strategy based on reciprocity can thrive in a world where many different kinds of strategy are being tried. Cooperation, once established on the basis of reciprocity, can protect itself from invasion”¹⁸.

Although Axelrod considers cooperation based on reciprocity to be stable, he is concerned with speeding up its evolution.

Without the foresight, the evolutionary process can take a very long time... The core of the problem of how to achieve rewards from cooperation is that trial and error in learning is slow and painful. The conditions may all be favorable for long-run developments, but we may not have the time to wait for blind processes to move us slowly toward mutually rewarding strategies based upon reciprocity. Perhaps if we understand the process better, we can use our foresight to speed up the evolution of cooperation.¹⁹

To promote the emergence of cooperation, Axelrod suggests (1)making the future more important relative to the present; (2)changing the payoffs to the players; and (3)teaching the players values, facts, and skills that will promote cooperation.

There are two basic ways to make the future more important relative to the present: (1)by making the interactions more durable, and (2)by making them more frequent. A good way to increase the frequency of interaction is to keep others away. Hierarchy and organization are especially effective at concentrating interactions between specific individuals. In a bargaining context, another way to make the interactions more frequent is to break down the issues into small pieces. This would allow parties to make many relatively small moves rather than one or two large moves. However, as long as the interaction is not iterated, cooperation is very difficult. That is why an important way to promote cooperation is “to arrange that the same two individuals will meet each other again, be able to recognize each other from the past, and to recall how the other has behaved until now”.²⁰ On the other hand, just as the future is important for the establishment of the conditions for cooperation, the past is important for the monitoring of actual behavior. It is therefore essential that the players are able to observe and respond to each other’s prior choices.

Raub and Weesie consider a different way to promote cooperation. Instead of iterating the game, they analyze the possibility that a player (called the trustee) can voluntarily provide a hostage, such as a bond. The hostage is intended to convince the other player (called the trustor) that the trustee will in fact cooperate.²¹

The research on cooperation theory has been extensive. It is very difficult to summarize it therefore; however, some parts of this theory can explain cooperation processes between regions of different countries.

To get one level down we shall look at international cooperation theory, which has mostly political character. Nevertheless, since any region is a part of sovereign state, the theory of international relations is a valuable source of some ideas to reflect on.

2. International cooperation theory

That cooperation produces benefits superior to conflict has not been challenged by different system theorists; the collective gains from coordination outweigh the solo benefits of conflict. The divergence has always been over whether cooperation will occur. The main argument on this point has developed between two most influential schools of international relations: realism and liberalism.

Realism depicts international affairs as a struggle for power among self-interested states and is generally pessimistic about the prospects for cooperation. "Classical" realists such as Hans Morgenthau and Reinhold Niebuhr believed that states, like human beings, had an innate desire to dominate others, which led them to fight wars.

By contrast, the "neorealist" theory advanced by Kenneth Waltz ignored human nature and focused on the effects of the international system. For Waltz, the international system consisted of a number of great powers, each seeking to survive. Because the system is anarchic (i.e., there is no central authority to protect states from one another), each state has to survive on its own. Waltz argued that this condition would lead weaker states to balance against, rather than bandwagon (cooperate) with, more powerful rivals.

In his book "Cooperation among nations" (1990) Joseph Grieco's maintains that in an anarchic world (1) states fear for their lives: this fear means (2)that they can depend only upon their own capabilities to survive, (3)that changes in one's capabilities relative to other states are a state's central concern, and finally (4) that states will not accept cooperative agreements that are relatively unfavorable since this reduces their security.²²

The principal challenge to realism came from liberal theories. Liberalists challenged the realist analysis that anarchy and the security dilemma inevitably lead states into conflict, first with the concept of transnational relations, which undermines the centrality of the state as the unit of analysis²³, then with neoliberal institutionalism, which argues that even if the state is a unitary actor, institutions can overcome the obstacles to cooperation that arise from anarchy. Liberalists have also suggested that the "globalization" of world markets, the rise of transnational networks and nongovernmental organizations, and the rapid spread of

global communications technology are undermining the power of states and shifting attention away from military security toward economics and social welfare.²⁴

Questioning the unitary state, Robert Keohane and Joseph Nye developed the concept of "complex interdependence." Countries deal with multiple issue areas - economics, environment, migration, and culture. In each of these areas, there may be more than one dimension, each with its specific patterns of power and influence. The definition of country interests, the influences on countries from actors within them, and the way countries interact flows through a network of relationships only some of which pass through the formal institutions of the nation-state. Some of these networks are embodied in formal institutions at the international level, like IMF or IATA, but most are not, being comprised of very influential patterns of norms or relationships, which John Ruggie called "regimes."²⁵

International regimes are set of norms, principles, rules, or decision-making procedures around which actors' expectations converge. Keohane showed that cooperation often fails because of coordination problems. Actors lack information about the behavior of others and find it costly to obtain such information. Keohane argued that institutions can ease these problems. Regimes facilitate cooperation through the function they perform for states. They mitigate the effects of international anarchy for states by aiding in the decentralized enforcement of agreements. Regimes are seen as improving each side's information about the behavior of the others.²⁶ They are also thought to change the pattern of transaction costs of cooperating by reducing "incentives to violate regime principles"²⁷. This further encourages cooperation, because the more actors are able to observe each other, the more they are able to assess the willingness of the other to comply with cooperative agreements.²⁸

Although institutions can facilitate cooperation when it is in each state's interest to do so, it is widely agreed that they cannot force states to behave in ways that are contrary to the states' own selfish interests.²⁹ It is also noted that the very existence of a regime indicates a prior series of decisions by states to cooperate.³⁰

The possibility of emergence of the international cooperation has given a spur to the development of hypotheses about the conditions under which cooperation is likely to occur. Helen Milner counts six such hypotheses: international regimes hypothesis discussed above; epistemic community hypothesis; absolute gains, relative gains and reciprocity hypotheses; number of actors hypothesis; iteration hypothesis; power asymmetry hypothesis.³¹

(1) Epistemic community hypothesis

An "epistemic community" is a "professional group that believes in the same cause-and-effect

relationships, truth tests to accept them, and shares common values; its members share a common understanding of a problem and its solution.”³² Its role can be similar to that of a regime. One difference between regimes and epistemic communities seems to lie in the type of information each provides. Whereas a regime gathers data on the preferences and compliance of other members, an epistemic community furnishes negotiators with “expert” information – a particular solution or compromise that advances the negotiations by coordinating states’ expectations.

(2) Absolute gains, relative gains and reciprocity hypotheses

A central proposition in the cooperation theory is that states cooperate in order to realize absolute gains. Following economic reasoning, it is posited that states act rationally to increase the net benefit they receive.

Grieco argues that states also pursue relative gains, always seeking to compare their absolute gains with those of other states. Relative gains are not their only concern; absolute gains do matter. But, in this setting, cooperation, he suggests, is much more difficult even when all sides can achieve absolute gains, because no state wants to realize fewer absolute gains than any other.³³

Reciprocity means that the absolute or relative gains received for cooperation must be roughly equivalent. However, what “balanced” or “equivalent” means for the different authors is unclear. It could mean that gains are distributed equally to all players or that they are distributed proportionally to some value, such as the players’ prior power positions or their costs or investments in the issue.

(3) Number of actors hypothesis

The hypothesis is that “the prospects for cooperation diminish as the number of players increases”³⁴. It is posited that large numbers increase the probability of defection and reduce the feasibility of sanctioning defectors. However, several strands of argument challenge this claim. First, a large number of players may be better, since it provides more opportunities for exchanges. Up to some point, then, more players may not necessarily hinder cooperation. Second, the number of actors may not be a structural condition but rather may be a strategic one that can be manipulated by the actors themselves. In such cases, situations involving large numbers can be broken down into situations involving smaller numbers. Third, the possibility of cooperation in a relative gains environment can be enhanced by increasing the number of players. Snidal argues that it is probably more dangerous to suffer a loss in a world with fewer actors than in one with more players, since “more actors enhance the possibilities of protecting oneself through forming coalitions, and, generally, the less well united one’s enemies, the safer one is.”³⁵ These three points suggest that the relationship between the number of actors and cooperation may be quite complex.

(4) Iteration hypothesis

As it has been already mentioned, the players' willingness to cooperate is influenced by whether they believe they will continue to interact indefinitely. Many have shown that adding repeated play (iteration) to the game makes the cooperative outcome more likely, as, over time, the value of continued cooperation comes to outweigh the benefits of defection at any one time.

(5) Power asymmetries hypothesis

This hypothesis suggests that imbalances in power are conducive to cooperation. This argument resembles the hegemonic stability theory. These differences in influence allow stronger actors the greater role in organizing the system. However, studies by Grieco and Haas have shown that in fact the weaker states obtain the better terms.³⁶

The consensus on a definition of cooperation as well as the above mentioned propositions about the conditions under which cooperation is likely to emerge made a significant contribution to the cooperation theory. However, the theory is neither homogenous nor complete.

For example, constructivists and sociological theorists consider that both realism and liberalism neglected nonrationalist and nonmaterial aspects of the interaction of units. Neither has paid much attention to culture, ideas, values, the internalization of norms, the constitutive elements of identity, or the tissue of human exchanges and cultures that structure interaction. Some constructivists offered a model of the strategic interaction of unitary states being shaped by the cultural and cognitive understandings each internalized from a global system of cultural construction.³⁷

On the other hand, the domestic politics school complained that the domestic politics elements of international politics were being neglected. Keohane notes countries can cooperate if they want to. For these critics, the issue of whether they want to cooperate turns on domestic politics, on whether there is support at home for cooperation, and whether the supporters are able to prevail in policy debates. States may devise internationally cooperative solutions and overcome cheating and relative gains concerns, only to find that their domestic situations will not support them. Cooperation may be unattainable because of domestic intransigence, and not because of the international system.

There are four prominent theories of domestic politics, each of which highlights different factors: pluralist theories; elite theories, institutional theories; and Marxist theories.

Pluralist theories suggest that the preferences of interest groups and the dynamic of party systems should matter most. Groups of parties that anticipate net gains from cooperative agreements will vie with

those likely to suffer losses, and the influence of these actors and their relative access to policy-making institutions will shape the state's preferences and bargaining abilities.

Elite theories of politics locate the sources of cooperation in the nature of the national decision makers. The background, beliefs, and political context of these elites will shape international bargaining.

Institutional theories of the state focus on domestic decision-making structures. The character of domestic political institutions may condition both the preferences of a state and its ability to negotiate internationally.

Finally, Marxist theories of politics illuminate the centrality of capitalism and classes for cooperation. It is the interests of capital that determine the national interest. Domestic capital may desire international cooperation and pursue it through cross-national alliances and cartels, or national capital of different states may battle each other for foreign markets.

Economic cooperation is considered to be a part of the process of international political cooperation.³⁸ International cooperation in economic policy extends back at least to 19th century cooperation between central banks. The Bank of England and the Bank of France, the major repositories of gold in Europe, helped each other in several 19th-century crises, starting as early as 1825. Russia and France, economically linked through French loans to Russia, also cooperated in maintaining the convertibility of gold in France.³⁹

Economic cooperation penetrates all levels economic activity: from government to workers. Lane Kenworthy has summarized the types of economic cooperation in the Table 1.

Actors cooperating	Institution(s) promoting cooperation	Economic Benefits
Macro level		
1. Firms across industries	Centralized business federation	Reduced rent-seeking
2. Unions	Centralized and/or concentrated labor movement	Wage restraint
3. Government and interest groups	Centralization/ concentration of authority in the state and interest group	Coherent, productive government policy
Meso level		
4. Purchasers and suppliers	Long-term commitment by purchasers	Heightened communication, greater supplier willingness to invest and raise productivity
5. Investors and producers	Long-term commitment by investors – a product of investors having large ownership stakes and a means of effectively influencing producer decision making	Extended time horizons for producers
6. Competing firms	Industry trade associations or consortiums; government incentives	Quicker agreement on standards; greater investment in R&D and employee training; assistance with financing, technology diffusion, design, accounting, marketing, etc.
Micro level		
7. Labor and management	Long-term commitment by employers (employment guarantee)	Greater willingness on the part of workers to share valuable knowledge, accept productivity-enhancing

8. Workers	Employee participation in decision making combined with team production and/or revenue sharing	technology, and upgrade skills Greater work effort
9. Functional divisions within firms	Unified teams that link the various departments along the production chain	Quicker, more effective transition from R&D to production

Table 1. Summary of key types of economic cooperation. Source: Kenworthy Lane. In search of national economic success: balancing competition and cooperation. 1995. P. 157

Economical geography made its contribution to the cooperation theory by developing the gravity model. The gravity model, as social scientists refer to the modified law of gravitation, takes into account the population size of two places and their distance. Since larger places attract people, ideas, and commodities more than smaller places, and places closer together have a greater attraction, the gravity model incorporates these two features: size and distance. Some prefer to use the functional distance (as time needed to cover the actual distance) instead of the actual distance.

Opponents of the gravity model explain that it can not be confirmed scientifically, that it's only based on observation. They also state that the gravity model is an unfair method of predicting movement because it is biased toward historic ties and toward the largest population centers.⁴⁰

Obviously, the economic science needs a comprehensive cooperation theory. It may borrow the basic elements from theories of cooperation in other spheres. However, it would be most interesting to see a theory of international economic cooperation complete with economic analyses of kinds, reasons, and possible results of cooperation. In particular, that could help answer the question about developing regional comparative advantage through international cooperation. The idea that cooperation and competition could effectively work together is not new, at least in microeconomics.

IV. Coopetition and game theory

In most of the modern theories of business, competition is seen as one of the key forces that keep firms lean and drive innovation. That emphasis has been challenged by Adam Brandenburger of the Harvard Business School and Barry Nalebuff of the Yale School of Management. In part using some of the ideas of game theory, they suggest that businesses can gain advantage by means of a judicious mixture of competition and cooperation:

Business is cooperation when it comes to creating a pie and competition when it comes to dividing it up. In other words, it is simultaneously war and peace. As Ray Noorda, founder of the

networking software company Novell, explains: "You have to compete and cooperate at the same time." The combination makes for a more dynamic relationship than the words "competition" and "cooperation" suggest individually.⁴¹

To find a way of bringing together competition and cooperation, Brandenburger and Nalebuff turned to game theory.

The roots of game theory go back at least to the nineteenth-century economists Augustin Cournot and Francis Edgeworth. The formal theory was introduced in 1921 by Emil Borel, a French mathematician, who wrote about "la théorie du jeu" in a note which looked at the phenomenon of bluffing in poker. In addition to noting the possible applications of game theory to political and economic issues, Borel listed some basic questions: "For what games is there a best strategy, and how does one find such a strategy?"

Von Neumann's 1928 contribution was to show that for two-person zero-sum games, a best strategy could indeed be found. He then extended the analysis to more general games. In their book "The Theory of Games and Economic Behavior", which appeared in 1944, von Neumann and Morgenstern stated their belief that economics would develop into a rigorous mathematical science. It led to large numbers of technical papers in the fields of economics, politics, military strategy, law, computer science, and even evolutionary biology. In each of these fields, game theory has resulted in major discoveries.⁴²

The theory of games provides a set of mathematical techniques for analyzing situations in which each agent's utility depends not only on his own actions but also on the actions of others; and all of the agents takes these interdependencies into account when deciding their actions.

In a zero-sum game, the sum of all agents' utilities is always zero. A zero-sum game is a game of pure conflict: what one agent wins, some other agents must lose. Clearly a constant-sum game is equivalent, with appropriate normalization, to a zero-sum game. A game of distributing a pie of fixed size is a zero-sum game; in most games in economics, however, the size of the pie depends upon how it is divided.

Nonzero-sum games have elements of both conflict and cooperation. It is in the agents' mutual interest to reach an outcome where the sum of utilities is relatively high; but the agents' interests conflict over their shares in that sum.

Depending on the institutional context, a nonzero-sum game may be either cooperative or noncooperative. A game is cooperative if agents can, before acting, costlessly make agreements which are binding and enforceable. It is noncooperative if there are no institutions which ensure that the agents will keep any promises they make.⁴³

Game theory makes it possible to move beyond overly simple ideas of competition and cooperation to reach a vision of co-opetition. It is particularly effective when there are many interdependent factors and no decision can be made in isolation from a host of other decisions. Game theory has had little influence on the theory of international economics: little mention of game theory is to be found in the trade-theory textbooks. Despite game theory's lack of impact on the body of trade theory, many of the important policy issues of international economics have some game-theoretic character.

Although the original co-opetition theory was developed as a company strategy, "agents" in game theory are not specified as companies. Therefore it is reasonable to suggest that game theory should make it possible to develop such a strategy for a regional level. There are many games that can predict potential benefits or losses as well as propose the best strategy for cooperating and competing regions.

V. Conclusion

Globalization of the world economy presents opportunities and challenges for the development process as well as risks and uncertainties. As a result of the process of globalization and growing interdependence in the economic, social and environmental fields, an increasing number of issues cannot be effectively addressed by countries individually. Therefore, international cooperation is required. If Robert Axelrod is right, cooperation is inevitable, because both state and non-state actors can be quite certain they will be interacting with each other year after year. Furthermore, non-state actors have important roles to play in the emerging network of international cooperation.

It is important that regions realize the potential of economic development by promoting cooperation. For that purpose a comprehensive theory connecting international cooperation to development of regional competitive advantages and thereby to economic development is needed. Such a theory would be helpful in the process of planning. If the cooperation theory was in place, the characteristics of a particular region would then identify the optimal patterns of cooperation and the type of cooperation engendering processes the regions should incorporate to achieve it.

It is common that regional governments have departments of international relations. They analyze current state of international economic relations with foreign countries or regions. It is uncommon, however, that those departments present plans or programs of developing those relations. The reason might lie in the problem of subordination to central state authority, in the lack of initiative from regional bureaucrats, or in

unwillingness to finance international projects. However, the underlying reason might be a lack of a comprehensive theory of international regional relations.

It is therefore important to develop such a theory. It will take not a single decade: as we have observed, consistent theories have been developing for centuries. However, with time the necessity for this theory should be realized. Hopefully, economic science can provide the tools needed for its development.

Endnotes

- 1 True cooperation usually occurs where the safety or survival of the parties depends on sharing resources. It will continue as long as all those cooperating receive more of a scarce resource than they would by competing with the others. The cooperative interaction results in more scarce resources being acquired than would be possible by individual actions. This is sometimes referred to as a “non-zero sum game” because a gain for one cooperator is not a loss for the others. However, a reduction in one or more of these resources will cause former cooperators to compete or former competitors to cooperate, or both.
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- 23 For the model of "transnational relations" see Robert Keohane, Joseph Nye, "Transgovernmental Relations and International Organizations" (1974) and Transnational Relations and World Politics (1972).
- 24 This view has been challenged by scholars who argue that the actual scope of "globalization" is modest and that these various transactions still take place in environments that are shaped and regulated by states. Nonetheless, the belief that economic forces are superseding traditional great power politics enjoys widespread acceptance among scholars.
- 25 The major statement of these themes was published as "Power and Interdependence" (1977).
- 26 The regime theory has been attacked for its inattention to power issues. The distribution of power internationally is seen as underlying regimes and as being responsible for changes in them. Given their concerns about relative position,

states are likely to disagree about the amount of information they will release to others and about the principles that define the regime.

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