Working Paper

The Impact of Globalization on Collaborative Strategic Business Options

Jaroslav Jirásek

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IIASA

International Institute for Applied Systems Analysis □ A-2361 Laxenburg □ Austria

Telephone: (0 22 36) 715 21 *0 □ Telex: 079 137 iiasa a □ Telefax: (0 22 36) 71313

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1 Introduction

Although "globalization" (as an activity) or "globality" (as a predicament) can be traced back to the time of fordistic or batistic[1] industrial expansion (when the "demand power machine" began to operate), its proliferation took off in recent early 1980s. A variety of firms has been embraced by the global framework, and their number is constantly increasing. Cars, consumer electronics, cameras, processed food, jeans and T-shirts, cosmetics, and innumerable other are frequent "global goods." Globality has grown to a topical international issue.

Unusual terms were introduced to demonstrate the importance of global options, such as "world factory," "world-wide systemofacture," "global industry nexus," "global assembly line," "global extended bench," and "global city." This professional slang only draws attention to problems that require a more profound explanation.

Economic systems theory has been challenged by formerly little known phenomenon. Globality impacted the lessons of competitive advantage, rational production size, product life cycle, organizational build-up, spatial linkage, and many others. It appears associated with new dimensions of the economy of scale, advantage of the so-called "permanent change," remote computer integrated control of production and distribution, application of sophisticated informatics, telecommunication and logistic, and changes of technical and social organization.

The systems approach to dynamic economic processes has to take into serious consideration the global factor along with all others.[2] Many problems cannot be solved anymore without the elements of globality. For instance conceptual assumption of advanced production and sales networks, new spatial world-wide division of labor, full use of labor and natural resources, risk distribution, etc.

[1] T. Bata (founder of the Bata Shoes Co.) adopted fordism but extended ideas of factory system to whole town life (Bata, T.: Factory Town, Zlin, 1931).

[2] For instance economic, technologic, social, cultural, ecological, etc.

Globality coincides with an exceptionally high density of collaborative agreements and ventures.[3] In particular, when high technology develops along with widespread commercialization. This working paper is to be taken as an autonomous contribution to the problem of international collaborative options.[4]

It is recommended to get acquainted also with other IIASA working papers on this subject, e.g., Cooperative Business Strategies, 1990; International Cooperative Business Models, 1990; The Impact of High Technology on Cooperative Business, 1990.

2 Spatial extension of production, distribution, and capital

The 45 years after World War II have been marked by an almost continuous material growth around the globe. In the first decade, postwar reconstruction was accomplished in most countries. After another extensive development of national economies, the last decade or more was predicated by a considerable increase of spatial dimensions for production, distribution, and capital accumulation.

International trade exceeded world production growth by a margin of some 15 to 25%. Out of the national GDP, between 10% and 50% is traded internationally (of which 10 to 20% in large, around 25% in middle size and 30 to 50% in small countries respectively).

For a variety of products, economic relations became increasingly transnational. Research and development, design, fabrication and assembly, sales, maintenance, etc., are spatially dispersed and management, production control, resourcing, logistic, communication and transport, capital transactions are effectuated across national borders, often at large distances.

Far from being balanced, this growth proceeded predominanantly in the "active zones" of the industrial world with highest technological advances, productive creativity and capital initiatives. The Triad (consisting of the US – Canada, Western Europe, and Japan – Southeast Asia territorial integrations) has attained the dominant stage. The Second World is declining, thus exposing the dichotomy between the First and Third World.

As international trade grew at an accelerated pace, international competition intensified and brought about new organizational forms. Multinational corporations (MNC) coordinated their global strategies from their headquarters among their various subsidiaries. On the list of the largest world firms, the first 250 are MNCs.

[3]Like industrial agreements on information exchange, joint marketing, or market remuneration, joint R&D (R&E), licensing, franchising, coproduction (parts supply, delimitation of product lines, joint assembly), joint capital ventures.

[4]Cooperative (collaborative) forms expanded particularly after the 1970s. It has been recognized that partnerships are not only sensible responses to imposed market restrictions, but often also a shorter way to the wanted comparative (competitive) advantage.

Unlike national firms operating in single national markets, the multinational oligopolies can make use of a highly rational composite of enterpreneurial, human, cultural, technological, and natural resources of the world. The enhanced competitive edge (articulated not only in widened scales or scopes of economic activities but also in structural advantages), enables the MNCs to reap incomparable superprofits.

In more recent times (from the first half of the 1970s on), the range of MNCs, in particular in the field of high technology, did not appear sufficient to provide for threshold levels of capital, research, manufacturing capacities or distributing networks; leading firms found themselves compelled to enter diverse cooperative arrangements.

Along with the internalization of globality in the NMCs, cooperative agreements and ventures, i.e., externalized combinations of productive factors, began to grow and challenge the strategic policy and decision making. Also the economic, theoretical orthodoxy faces unexpected phenomenons which reach beyond any conventional explanations.

3 Global options

The trend toward global operations affected already an increasing number of industries and commodities. By 1980 internationally traded goods comprised some 80% of all industrial sectors.

The conventional approach to market penetration has been a gradualistic one: the firm set foot in one market and after having embarked on beneficial operations, extended its operation to another market, and so on. However, large R&D commitment and capital investment, which are indispensable in many advanced industries, and the pressure of acute competition, no more allow any prostrated market extension. Large market spaces have to be filled in ("conquered") during short time campaigns.

A number of markets appear increasingly homogeneous as differences in material interests, needs, and tastes are downplayed and buying power or further economic patterns converge.[5] Similarity of markets facilitates placing of uniform products in diverse countries, and stringent competition drives firms to develop large scale regional or global marketing strategies.

From their headquarters, large oligopolist firms develop concentrated global market offensives and try to gain benefits of extensive superprofits. Global information gathering and analysis, global distribution network, global technology transfer, and manufacturing facilities bring goods to the attention of hundreds or millions of potential costumers.

Experience in handling foreign manufacture and sales, new product introduction and adjustment, grew to another competitive advantage of many MNCs. Economies of scale of an elevated order of magnitude provided the most frequent opportunity for improved cost-benefit ratio.

Globalization of products and manufacturing increased the threshold levels of minimum R&D and efficient size of production, thus strengthening market positions of leading

[5]The idea of perfect homogeneity was embedded in the postwar "modernization theory." In forthcoming years it did not prove to be realistic.

firms. Higher expentidures for new products development or manufacture restructuring are spread over a large volume of sales.

Some corporations globalized their manufacturing networks, others used various arrangements with other firms. For instance, some dislocated their retail outlets around the world, others preferred to be served by large export and retail companies. Some expanded their maintenance services, others rely on local maintanence facilities. Some augmented their financial backing, others work with local banks.

Assymetry in globalization is many times caused by preferential treatment by local administration or, on the contrary, by threat of destabilizing factors. Encouraged or discouraged by local diversities, global firms articulate their specific enterpreneural and set their priorities.

Unlike national competitive advantage, global competitivenes can reap composites of national potentials, cultures and traditions, natural resources, spatial configurations, etc. A growing number of companies adopted new logic of global market options, moved by the changing character of products and technologies, and prompted by hard competition.

Examples of industries impacted by globality of products or production methods could be semiconductors, aircraft, pharmaceuticals, or cars, TV sets, cameras, bottled or canned food. The former are pushed to global dimensions due to voluminous R&D, the latter due to wide commerciability, both by massive capital expenditures.[6]

4 Enabling, incentive and restrictive factors of product globality

Trend to globality is not only a simple response to growing quantity of industrial output. Some qualitative changes in the product design, production methods have taken influence, too. In more specific cases also the mandated governmental protection policies or geopolitical settings.

[6]IBM, Sony and Coca-Cola are credited for first breakthrough to globality of products. All are still taking the first three places in public awareness of their trade marks.

In brief, a tentative list of these factors may highlight the dialectics of integration and fragmentation, globalization, and localization:[7]

Promoting globalization	**Promoting localization**
Customers and markets	
Customer interests and market convergence	Local customer interests and habits, market fragmentation
Cultural convergence	Cultural divergence
Income levelling	Income stratification
Design	
Module (structural interchangeability, aggregation from parts and elements) concept	One purpose-concept
Standardization	Customizing
Production capacities	
Flexible, universial	Hard, specialized
Complementary manufactures and services	
...	...
Special technology, maintenance, power, etc.	
Widespread	Localized
Supply and Subcontract	
Transportable at low cost	Just-in-time logistic
Information and Communication	
Technical (internal for MNCs, or external networking)	Social (personal) and spatially bound
Capital Formation and Financing	
Large world banks	Local banks
Legislation	
Open	Protective

[7]For more insight, see also, e.g., The Impact of High Technology on Cooperative Ventures, IIASA, 1990; International Cooperative Business Models, IIASA, 1990, and others. A systematic and summing-up information is provided by the papers of the US National Academy of Engineering: Technology and Global Industry, Companies and Nations in the World Economy (B.R. Guile and H. Brooks editors), Washington, D.C., 1987.

Far from being complete and explicit, the survey indicates, that globalization as the mainstream is continuously challenged by an opposite trend.[8] The solution is not of an either-or but mutually dependent. For instance, global R&D can tap on cross-cultural contributions or global deliveries be supported by local adjustment, global marketing be strengthtend by focusing on local tradition.[9]

5 Assymetry of current globality trends

The penetration of large production, distribution, and capital appears not to be undifferentiated, but driven to particular parts of the world rather then elsewhere. Key determinants of that switch could be identified as follows:

- financial attractiveness (e.g. political and legal guarantees of the invested capital, low tax burdens, available subsidies, easy profit repatriation)
- favorable social and cultural policy (e.g. subsidies for daily life expenditures,[10] widespread education and training, health care, and advanced "work culture")
- acceptable environment policy (e.g. ecological duties of the firms)
- availability of well prepared engineers and craftsmen
- abundance of low cost labor
- background of scientific, technological and other professional institutions
- acceptable level of labor unionization or protective labor legislation
- physical and business infrastructure (e.g. R&D, production or sales facilities, cheap resourcing, reliable subcontract, transport and communications, banking, insurance, consulting, advertising, etc.)
- intellectual property protection (patents, copyrights)
- spatial configuration and provisions for organized complemantarity and synergy.[11]

[8]The theoretical orthodoxy often embarks on deterministic and dichotomic reductions, suggesting here globalization, there localization. Throughout the world economy, an increasing possibilism of complementarities and synergies is carrying on. The classic German thinking (after G.W.F. Hegel) suspected a "hidden trend" toward "one world-wide production," i.e., a congruence of world needs and production potentials.

[9]The EC in its conceptual deliberations relied upon the "European customer" It was presumed that same product would be accepted in all parts of the Common Market, thus considerably increasing the benefits of the economy of scale. However, national and local approach appeared to be a vigorous factor. The expected homegenity of the European Market is still years ahead.

[10]For instance provisions for cheap housing, food, local transport, etc. (so that qualified labor still remains less expensive).

[11]Particularly in locations with high technology networking.

One of the most considered preconditions is the character and stability of the political (and therefore also legal) setting, maturity of the democratic mechanism and market economy relations. Much concern has to be given also to the presence or absence of any strong competitor.

6 Strategic alliances

Globalization is credited for the "sudden surge in strategic partnering now occurring internationally" ... involving "coalitions that are to be seen not as attempts to stiffen competition, but as mechanisms ... for innovations" ... that enable "easily attain" ... the "threshold level" ("critical mass") for market breakthroughs.[12]

Even some extremely large firms are now engaging in collaborative business, because they do not find any other path of development. Not many years ago, it had been hardly suspected that leading oligopolist firms would enter into mutual business cooperation.

Globality has thrown a new light on competitiveness and prosperity. Global collaborative business models are no longer viewed as a kind of second-best solution (in order to accelerate the market entry, avoid competitors or pool expenses and risks), but as a non-alternative outcome of world business trends.

What are the rationales of cooperative global models? Despite a great diversity of individual involvements, the reasons for collaborative global options are basically two:

- integration mode,
- contractual mode.[13]

Large corporations prefer to cover global operations within the reach of their world-wide networks. Others are compelled to adopt inter-firm arrangements. It must be admitted, however, that the divides can be rather fuzzy and mixed modes take often place. Is the global cooperative option then a function of firm dimension?

Before we try another generalization, let us throw a critical light on the problem of firm size. A number of scholars disposed the question of small and large firms promoting technology dominance and global applications. According to a more or less frequent scheme in the long run, small firms are more innovative, but less prosperous, while large ones appear less innovative, but more prosperous.

The divergence of conclusions has been many times bridged by the assistance of the product life-cycle approach. Small firms play an active role in the incubation and early stages, while powerful corporations begin, once the product reached a mature stage, to add advantages of large scale (or scope).

[12]Teece, D.J: Capturing Value from Technological Innovation: Integration, Strategic Partnering, and Licensing Decision, in: Guile, B.R. - Brooks, H. (ed.): Technology and Global Industry, Companies and Nations in the World Economy, Washington, D.C: 1987, p. 90.

[13]Terms coined by D.J. Teece. Other denominations from organizational/market or vertical/horizontal, to internalized/inter-firm linkage. See also previous IIASA papers on cooperative business options.

Globalization as a search of a special competitive advantage is usually directed either toward global mass commodities commercialization or extremely sophisticated breakthroughs for future market application. In the latter case, strenuous, mostly also risky, "precompetitive" scientific, experimental or engineering collaboration is challenged.

Some examples may assist in better understanding of the trend and its diversities. Coca-Cola has gathered an almost incomparable experience with the globalization of a technically simple product. A secret recipe for sirup production assures a strong central position of the headquarters. Globalization is effectuated by a network of franchise bottlers and sellers.

Sony Corp. promotes sophistication of products, prepares global campaigns for widespread use of their magnetophones, radios, TV sets, videos, camcorders, etc. Global distribution is operated by other wholesale and retail companies.

Black & Decker prepared the world-wide manufacture and distribution of electric tools. Most products had to be redesigned to enable performative and low cost fabrication and assembly of flexible products.

Separate attention should be drawn to a new global strategy of the so-called "hollow companies" which focus on engineering, but redeploy manufacturing to other subcontract firms. Large firms, such as Boeing or Westinghouse try to cope with global competition on this path.[14]

7 The case of the semiconductor industry

The semiconductor industry is leading the high technology peleton, so far. Having started after the invention of the chip (1972), up-to-day semiconductor industry was growing at a rapid pace, and at the same time was subject to devastating competition. Only two dozen large producers of universal semiconductor active elements survived. Others had to diversify, retreat to customizing, or were phased out of the business.

The semiconductor industry has been many times used as a paradigmatic example of the "new international division of labor" (often with a parallel orthography "new" international division of labor.)[15] A sizable portion of this industry has been relocated to rapidly developing Third World countries, particularly to the " Four Asian Tigers"[16] and their neighbors.

[14]Time will prove, whether the "hollow" strategy, deprived of direct manufacture experience, will keep pace with other cooperative forms.

[15]Walton, J.: The Third "New" International Division of Labor, in Walton, J. /ed/: Capital and Labour in the Urbanized World, London, Sage, 1985, pp. 3-14. According to this study it is conceived that the international division of labor has developed through three stages: first in times, when agriculture and extraction of minerals dominated the economy; second, when Industrial Revolution shifted the dominance to the industry, but industry in core industrial countries continued trading with "peripheral" primary commodities countries; and third, current, when "semipheral" /newly industrialized countries, NIC/ are being involved.

[16]Taiwan, South Korea, Singapore, HongKong with neighbouring Malaysia, The Philippines, Thailand, Indonesia.

The story of the American semiconductor manufacture seems to provide a teaching insight into the globalization of high technology production.

Twelve leading US semiconductor producers expanded over the globe. However, they opted for only four regions: UK (mainly Scotland), Western Europe, Japan and Southeast Asia:

Activities	Number of units deployed in				
	USA	UK	W. Europe	Japan	S.-E. Asia
Headquarters and overall control	12				
Foreign branches and affiliations		9	7	3	36
R&D	12	4	2		
Design	12	5	1	3	
Marketing	12	5	3		5
Fabrication of masks	12	1			
Fabrication of wafers	12	4	5	3	
Assembly	1	1			36
Testing	12	3	4		

Remarks: Companies surveyed were Motorola, National Semiconductor, Fairchild, Texas Instruments, General Instruments, Hughes, Siliconics, Teledyne, Advanced Micro Devices, Silicon System, Sprague, Zilog. Deployment in the UK: predominantly Scotland and Wales; in Western Europe more than half in France; in Asia mostly in Hong Kong, Singapore and Malaysia.

Source: Henderson, J.: The Globalization of High Technology Production, Society, Space and Semicomductors in the Restructuring of the Modern World, London-New York, Routledge 1989, p. 46-47.

Deployment in the Asian NICs can be argued beyond a mere preference of low cost labor. At least at the early stage, chips fabrication has exploited the incomparable manual decterity of Asian workers (particularly female.)[17]

The division of labor in the semiconductor industry still combines core high engineering with a big share of inexpensive labor while keeping the share of high paid craftsmen low.[18]

As soon as fabrication of chips has been passed on to robots, that advantage will get mitigated. This begins to happen not only as a response to the Asian competition, but also as an indispensable technical change due to the advanced complexity, high resolution standards and increased speed of production.

[17]From their childhood they train their fingers in several popular arts, such as calligraphy, flowers arrangement, wood letters carving, handmade prints, dwarf trees planting, tea ceremonies, etc.

[18]The "Four Asian Tigers" offer a rather advanced engineering and also adequate skilled labor at low cost. This is to be explained not only as a result of a modest standard of life. In HongKong, for instance, housing, food and local transport are subsidized (land is in public ownership), in Singapore, an extensive public ownership of companies allows conveying of unnoticed state subsidies. Low cost labor results from a targeted state policy, too.

The theory of "new" international division of labor is being questioned while it undergoes several substantial changes. For instance, research and development remained typically in the home country nearby the headquarters. However, as more products are developed for voluminous regional or global markets, and for simultanous rather than sequential introduction, a need for networking of pluralistic research, experimentation, development and design has grown.[19]

Also as the main semiconductor client has been transferred from the military to commercial, former prohibitive national provisions are alleviated and dismantled. Semiconductor production and consume can enter new territories.

An "invisible hand" has interconnected semiconductor firms. It is difficult, and without a professional guide almost impossible, to tell "who with whom." Even the largest firms are buying access to novel high technologies (which otherwise could cost them years of trial and error endeavour) or join for "precompetitive research."

The famous (but not fully successful) American consortium involved sturdy competitors in order to challenge the Japanese competition. IBM, largest among all semiconductor clients and holder of some two thirds, or so, of the world computer market, concluded cooperative arrangement with Microsoft Corp. to supply advanced software to IBM's operation systems. At the same time, IBM works together with a number of companies which deliver progressive modules to IBM assembly lines.[20]

This is an example of the newly proliferating "strategic alliances" which are stretching between the main semiconductor producers in the USA, Japan and Western Europe. For instance: Morotora – Toshiba; AMD – Sony; RCA – Sharp; Intel – Oki; Zilog – Hitachi, Fairchild – Hitachi, Motorola – Thomson, Texas Instruments – Philips, National Semiconductor – Thomson; Ferranti – Silicon Systems; and Toshiba – SGS; Toshiba – Siemens; also Philips – Siemens; all kinds of intervowen relations.

These strategic alliances jointly conceive, develop and design, and exploit increasingly expensive semiconductors. Collaborative arrangements from time to time end in mergers and acquisitions, but new alliances are being tried.

After not more than 10 years, the theory of the "new" international division of labor is becoming void. Not cheap labor, but knowledge embodied in science and engineering, education and skills is taking power. Upstream development (towards R&D) and not only downstream (towards cheap labor), in other words all stages of the value added chain are activated.

There is a tendency to use all available (or potential) resources on the global basis as the mainstream of globality.

[19]Doz, Y.: International Industries: Fragmentation Versus Globalization, in: Technology and Global Industry, Companies and Nations in the World Economy, National Academy of Engineering, Washington, D.C., 1987, p. 107.

[20]Once a company can satisfy IBM needs, it can "sell into any other arena" McKenna, R. Market Positioning in High Technology, California Management Review, 3/1985, p. 94, quoting the management of Chipher Data Products, Inc., another IBM collaborator.