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University of California at Berkeley
Institute of Urban and Regional Development

REGIONS AS INTERNATIONAL PLATFORMS FOR ECONOMIC DEVELOPMENT: THE CASE OF THE WEST COAST OF KOREA

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Introduction

The development of regions in the Pacific Rim has lately received much attention around the world. There is increasing interest in the emergence of the Pacific Rim as a new venue for a new form of economic development. It is clear that the resource base and energy systems that drove the economy of the twentieth century will not and cannot shape the next century.

The reasons for this are fairly self-evident. First, the natural resources that undergirded the industrial manufacturing economy are totally reshaped. Industrial production is no longer limited to the so-called advanced industrial nations. New technologies have made it possible for the first time to export productive capacity to low-wage, low-cost areas, like China and Bangladesh, and away from the basic natural and human resources that created the infrastructure for manufactured products. Moreover, industrial activity has placed an enormous strain on the physical environment, creating air, water, and soil pollution in the most advanced industrial nations. As a result, industrial activity is no longer viewed favorably by many communities. Finally, natural-resource constraints, such as depleting oil supplies and the diminishing requirements for raw materials in production, are reconfiguring the role of both nations and regions within nations. In essence, what "was" will not shape what will be. We know this, but we do not know very much more about how to determine the path of development in the next century or what role nations and regions within nations might play.

In this paper, I will make the case that advanced information and international trade-based regions are the new base for national economic form and the new venue for economic development. I will do this by tracing the factors and forces that are bringing these transitions about and describing the new role for international trade and information as the core industrial base over natural resources and locational attributes. I will describe the role of international transportation and high technology in regional development with particular reference to the Korean West Coast.

New Roles, New Rules

It is important for policymakers to comprehend the altered context of regional economies. Regional areas are moving beyond their parochial and limited roles framed solely by their local eco-

conomic base to areas with a genuine stake in the international economy. There is considerable evidence that regions are responding to forces and factors that lie outside of their immediate economic circumstances. The capacity of regions to respond to these changed conditions will allow them to shape their own destiny rather than be shaped by the forces that surround them.

Regional development in Korea will undergo far-reaching changes. In the next two decades, Korea will have to re-position itself in the international economy. Korea's emergence as an economic power in manufacturing and consumer products will be challenged by China and other rapidly developing economies in Southeast Asia, the Middle East, and Russia. As a result, as stated in *Realigning Korea's National Priorities*:

the promotion of technological development is crucial (because) the driving force behind Korean economic growth in the past, is not likely . . . and the acquisition and transfer of foreign technology is becoming more expensive and difficult. Advanced countries are increasingly aware of the 'boomerang effects' . . . in the erosion of the competitiveness of the technology supplier.¹

Korea will have to develop economic development strategies that make it more than a producer of raw materials. It will have to be a developer of new science, based on its geographic advantages as a natural transportation path for world commerce. These structural reforms, according to Korean policy advisors, must be designed to improve the efficiency for development of science-based industries and producing higher-value-added products². This is precisely why the West Coast of Korea is an important element in Korea's next stage of economic development.

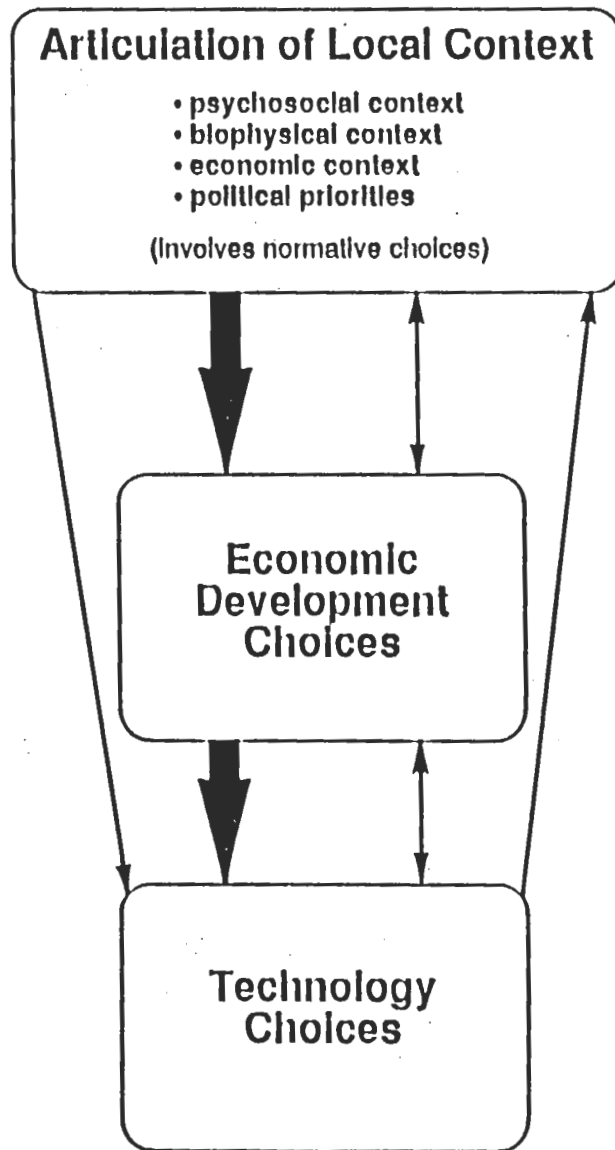
As Korea's economy transforms, there will have to be a merger between its natural advantages, biotechnology and pharmaceuticals, computers, and transportation industries, as well as basic production firms. These firms will need space, work force, communications, and housing. The emergence of the West Coast area as a venue for this development will become important to the nation's economic growth and development. In addition, Korea will have to open not only its economy but its national borders to both expatriate Koreans who have developed industrial and scientific knowledge in the United States and Europe and its own youth who seek an international standard in high-quality lifestyles. Research recently completed by me and others indicates that Korea's West Coast stands in a direct path of this form world economic growth and expansion, as indicated in Figure 1, below.

The World Scene: Regions, Technology, and Economic Development

On a world scale, a lively debate has recently emerged over the relationship between technological change and urban or regional form. The rise of various "high-technology" regions, particularly in the United States, has stimulated efforts by state and regional governments throughout the world to create or induce the formation of similar high-technology industrial nodes in their own territory. A range of policy instruments has been devised for this purpose, including, for example, science parks, technology parks,

Figure 1

Economic Development Planning and Technology Choice



Planning processes



"Real world" economic, technological and political processes

innovation centers, training programs, taxation zones, targeted research funding, regulatory streamlining, direct subsidies to firms, or special financial schemes to aid small start-up high-technology firms.

First, technological innovation has become recognized as a determinant of the economic performance of industrial firms and sectors. Changing market conditions, increasing costs of industrial inputs, greater emphasis upon information flow as part of the economic process, more complex trading patterns, difficult regulatory requirements, and sophisticated product-standard environments— to name some of the key pressures facing contemporary businesses— all place a premium on an organization's competence in adopting and managing new technology. Technology, furthermore, has come to be seen less as something which emerges miraculously out of the "black box" of science and engineering, exogenous to the processes of the economy, but rather as linked with the regional economic and managerial context.

Second, growing international competition and interdependency in trade has given technological innovation an even higher profile in economic policy, and firms are increasingly forced to innovate in order to remain in business. In the 1950s, Korea embarked on an import substitution path to build the economy. This policy was successful as long as the economy was closed. As the Korean economy opened to the international marketplace, it was necessary to shift emphasis to export expansion (see Table 1).

Table 1

Korea Economic Growth-Import/Export

<u>Demand Sources</u>	<u>1955-63</u>	<u>1963-73</u>
Export Expansion	7.0	35.8
Import Substitution	35.7	10.6
Domestic Demand	24.9	34.8
Changes Input-Output Coefficients	32.4	18.8

Source: Kwang Suk Kim and Michael Roemer, *Studies in Modernization of the Republic of Korea, 1945-75: Growth and Structural Transformation* (Cambridge, Mass.: Harvard University Press, 1979, pp. 114-15).

As a consequence, the strategic management of trade and technological innovation has become an important component of corporate management, and most national and provincial governments have now established some kind of bureaucracy that deals with technology policy. Consequently, education becomes a new central resource for regional and national policy.

Third, the phenomenon of "uneven development" has received considerable scholarly and political attention in Korea. It has long been recognized, at least since the classic work of Adam Smith or Karl Marx, that the generation of wealth tends not to be distributed evenly between either social classes or nations and regions within nations. This tradition in scholarship has witnessed a revival in recent years, fed by contributions from a number of disciplines, including political economy, geography, city and

regional planning, and sociology. Much of the recent literature is united by the theme that the economic disparity between regions and within regions increasingly exhibits structural features, changing in consonance with macro-economic structural changes in the national and international arenas.

Fourth, uneven participation in human resource development and application has come to be seen as an explanation of uneven economic development among and within regions. Some of the research dealing with this theme is based on certain technology-based industry sectors in particular places, such as micro-electronics in Britain.

Fifth, as a consequence of the above themes emerging within scholarly debate, cities, or urban regions, have been recognized as the locus for leading-edge technological development, with a number of prominent "international" cities receiving the greatest attention: for example, the San Francisco Bay Area; the greater Los Angeles region; Cambridge, Massachusetts; Tokyo; Singapore; Cambridge, England; the M4 Corridor in Britain; and, more recently, Hsinchu in Taiwan and Osaka, Japan.

Sixth, given the prominence of a relatively small number of "international" high-technology metropolitan regions and their apparent interdependence, scholars have sought to understand both the way in which advanced technology industries affect urban form, and the way in which city structure affects the prospects and form of local educational infrastructure. No generally accepted theory has yet been distilled from these efforts, but a consensus does appear to have emerged that a shift from an industrial style of economy (with its emphasis on the flow of resources and goods, and the accumulation of tangible assets) to an advanced industrial style of economy (with its emphasis on the flow of information and the accumulation of knowledge) will be accompanied by a shift away from the "19th century agro-industrial" regional city form (with its simple center-periphery land-use patterns) to something more complex and probably more decentralized polynucleated system of communities within a regional system. This is precisely the type of regional economic system emerging in the Seoul-Inch'on region.

The convergence of two fields of scholarly endeavor, technological innovation studies and urban and regional studies, has been mirrored in the national policy arena in Korea and elsewhere, with the emergence of deliberate efforts to create modern cities in which "high technology" and its associated social forms may flourish. Examples include the "technopolis" regions in Japan, and the "multifunction polis" idea in Australia.

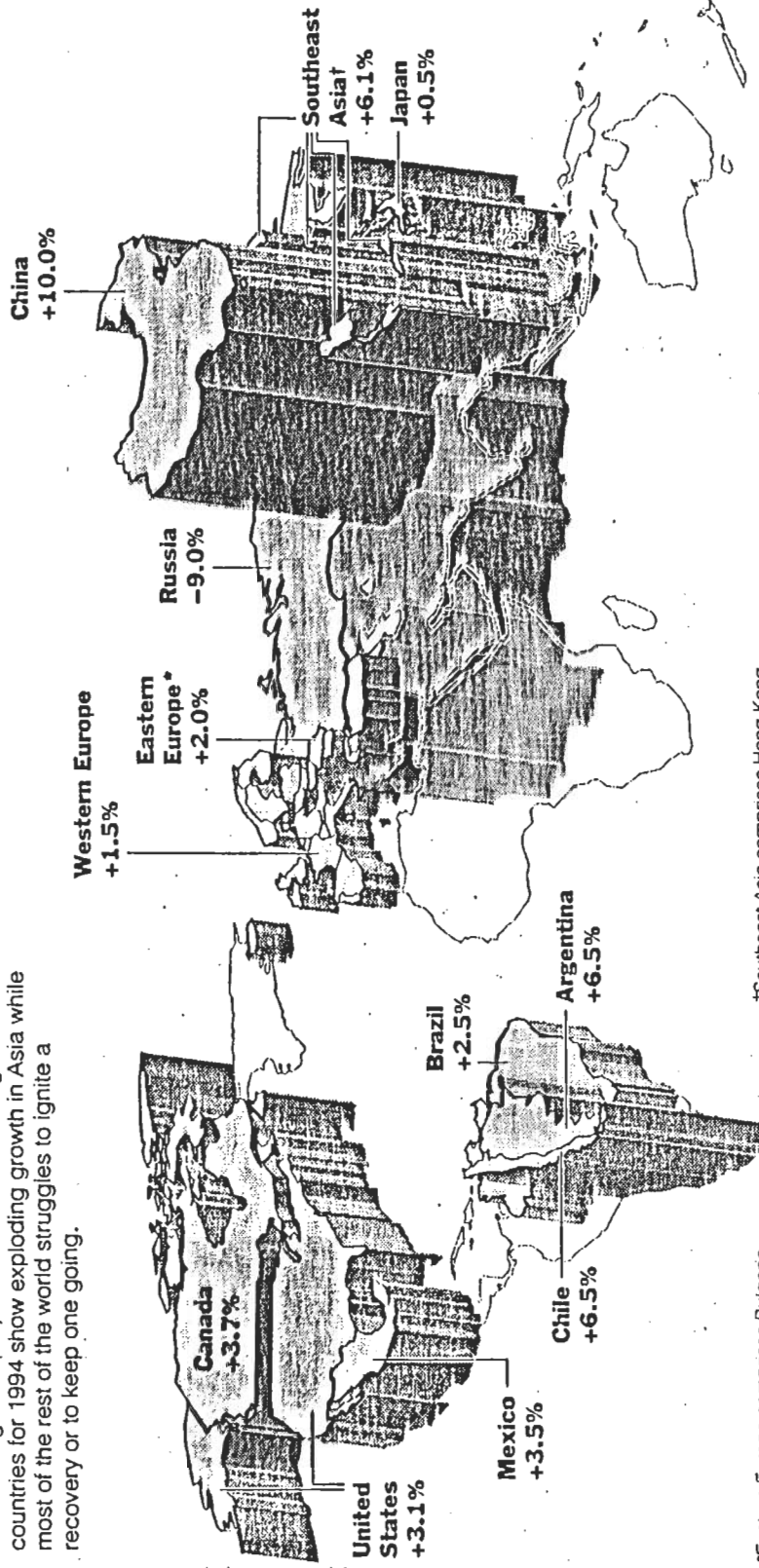
High-technology industries seemingly emerge in cities with a certain kind of regional structure, and the development of those industries subsequently exert influence on the region and reinforce the spatial features which first led to the flourishing of those industries. The result of these mutually reinforcing tendencies is that once a region becomes established as a high-technology region, it develops an international competitive advantage. Conversely, cities or regions that lack the appropriate structure find themselves increasingly bypassed by advanced technology industries and employment. Figure 2 shows the economic development planning and technology choice model that forms the base for an advanced regional economic development policy process.

Figure 2

An Era of Global Economics and Business Strategies

A Policy Compass Points East and South

Economic growth projections for selected regions and countries for 1994 show exploding growth in Asia while most of the rest of the world struggles to ignite a recovery or to keep one going.



*Southeast Asia comprises Hong Kong, Malaysia, Singapore, South Korea, Taiwan and Thailand.

*Eastern Europe comprises Bulgaria, Czech Republic, Hungary, Poland, Romania and Slovakia.

Sources: Organization for Economic Cooperation and Development; International Monetary Fund; Chinese Government

There are practical policy implications of this perspective. First, civic authorities and their advisors in high-technology regions may adopt such a perspective in planning the "urban" infrastructure most fitting to the evolving industrial base of their economy (e.g., transport facilities, housing developments, zoning requirements, project development regulations, educational institutions, communications facilities, et cetera). Second, managers of advanced technology firms may be indirectly influenced by such theories when making decisions about the location of their activities. Third, regional and city policymakers wishing to improve the economic prospects of their region may look to such ideas to guide the adoption of policies aimed at altering their comparative economic advantage.

There is little doubt, based on this discussion, that a new notion of economic development will be guided by a new set of regional parameters. This new view of region is emerging as separate identifiable socio-economic units. The old regional relationships based on rural and raw materials is dying because of external events, too large in scale and too distant from the locality to influence. Global and not local controllable factors, I am arguing, are influencing the pattern of regions and communities to a far greater degree than community development options. This can be observed in small resource-based communities as they spring to life because outside investors decide that the location is suitable for urban retirees, second homes and hobby farms for urbanites, backroom offices, or new exploitations of natural resources. In many instances, the existing rural identity was overwhelmed, left out, or left behind by these changing economic circumstances.

The transformation of regional economies form the basis of the global restructuring debate as it affects all of the world's metropolitan regions. It is manifest through such signs as the alteration of identity of once-proud small farm towns and the changing relationships among cities in the same national framework. It is obvious that these city/metropolitan regions are shaped by very different external economic forces and not by national economic trends. In a larger view, Seoul may have more in common with Los Angeles than it does with any other city in Korea. Similarly, Los Angeles has deeper relations with Tokyo and Seoul than with San Francisco. So, as we will see in the remainder of this paper, regions in the new advanced industrial economy are like islands of economic and social interaction in a global ocean. The relationship of these islands depends on their information trade, and it is within this context I sketch the new resource dimensions of the new global regional economy.

The Search for Regional Form in a Global Society

There is a series of new global realities that affects the nation so deeply that the understanding of regional development is being altered. The entire regional development process is being recast by a series of global realities that affect communities different ways. In large measure, these global realities are associated with specifically identifiable transformations, yet their impacts and implications are numerous and cross many conceptual areas in different ways. In the wake of these developments, some analysts have sought to produce general theory to describe and explain the confluence of urban and technological change.

This "high-technology regional form" notion, although normally implied rather than explicitly articulated as formal theory, suggests that there is a typical pattern in the way urban/regional spatial structure and the structure of high-technology industries coalesce. Walker observes this thematic development as follows:

[T]echnology has come to be viewed by the public as the key to the magic kingdom of regional development and national competitiveness. . . . It is not surprising, therefore, that various kinds of technological determinism have found their way into the regional debate, such as the notion that high tech industries have a unique locational pattern, that R&D centers are crucial to local growth because of their innovative function, or that the product cycle dooms older industrial regions to imminent stagnation.³

There are four new dimensions to the new technology regional development process that vocationally based education must consider.

Restructuring Wealth Generation

Wealth creation is no longer based on available rurally based natural, physical, or human resources. At one time, small rural communities with requisite natural wealth could depend on those resources, if properly managed, to produce sustained economic growth. The presence of iron ore, forests, or other natural resources were a key barometer of both local and national wealth. In fact, places derived their reputations and frequently their names from the wealth they generated. This natural wealth developed both an industrial form (for good or bad) and a community culture based on that pattern. It also developed a set of institutions designed to support this system of economic activity. In essence, this was a closed system in open competition with the rest of the world.

Similarly, cities with strategic locations such as seaports, rail heads, river access, and more recently international airports were the strongest in the economic system. These communities acted as international gateways for the natural resource areas as well as the finance and trade centers. Of course, an institutional system, including a social pattern, that was clearly recognizable emerged in these centers. Human resources provided a special set of assets for many communities that attracted capital and employment. This natural hierarchy of communities, combined with a rather predictable pattern of development, provided a conceptual base for regional development. Today, however, community assets in themselves are no longer wealth generators.

Regional wealth is created in today's financial environment through the re-combination and the re-designation of capital/financial assets rather than by producing products from the natural environment. As a result, money is the base asset. Thus, money alone is the determinant of the use of other assets, not the product of their use. The mobility of capital has created a new order of firms independent of places. A new order of international firms is emerging that is altering the development process in regions of all sizes which cannot be controlled or altered by a single community.

Community self-help schemes pioneered in Korea are stymied by this new system that may not recognize the intrinsic qualities of a rural or urban community (physical, natural, or human resources) as assets. While the old regional economic development orientation was to build wealth on community resources, the new economic order relies on the ability of a community to attract capital. The means to capital is through human networks and not other resources. Higher educational institutions have become nodes in the international capital distributing information network.

Repositioning of the Process of Region Building

Not only is the world order of nations changing, so is the organization of cities and towns. Information-dense large cities, not resource-based towns, are the major gateways for development. These cities operate outside the regional and even the nation state system. Their role as international centers of information and capital places — cities like New York, Los Angeles, San Francisco, Seoul, Taipei, Singapore, Hong Kong, Sydney, London, and Tokyo— operate on a different plane. They seldom need to interact with their surrounding communities or even the nation. This same pattern is emerging at small centers such as Las Vegas, Nevada, which is an international medical and software center as well as a gambling capitol. Similar movements are already underway in the West Coast developments in Korea. These new semi-rural areas connected by fax machine and computer are the new venues for rural development and not the farm center.

Accordingly, the notion of a "high-technology regional form" has appeared in the literature. Something of the spirit of this notion is reflected in the following extracts from a recent futuristic paper in this field, with a focus on North American cities:

A new national economic expansion driven by information-intensive technologies and the extension of global business services should be underway by the early 1990s. . . . Cities will be more polynucleated, with the development of more multiple-use mega-structures, and medium-density planned housing unit developments. . . . Increasing leisure and use of telecommunications will facilitate increasing low-density developments in which residential, work, leisure activities . . . and other local life-support activities are integrated, and increased emphasis on lifestyle and quality will ensure an increasing range and diversity of these developments within, at the periphery and beyond the urban area. The new affluence (for some) created by new technology will further add to this diversity and to the range of spatial development activities including global networks and virtual (global) cities. . . . The cities of an advanced industrial society — the future metropolis— will be primarily engaged in indirect, and partially abstract, transactional activities, and may be hungry for collective rites to offset social fluidity, economic transience and electronic isolation.⁴

In essence, the entire hierarchy of metropolitan communities with their surrounding towns and cities and the metropolis has been permanently altered. Small cities are not part of the new regional network. They are now part of the global economic roles. Even small communities, with the advent of new

telecommunications technologies, can play international roles. As a result, the interrelationships between communities that helped forge the community building-block context for mutual development has broken down.

Regional development practice has not recognized the extent and the means to assist communities to reposition themselves. The focus of regional development has been on the micro-community level rather than the macro forces changing communities' positioning in the international order.

The new regional development provides opportunities for communities to tie themselves into a dense regional communications network that builds on the human resources and projects them internationally. The natural resource base then become secondary to the information system and the manner by which it is articulated internationally.

The Uncoupled Professionals

Professions and professionals operating in metropolitan regions have, until recently, played their roles in relatively clear and well-defined boundaries. An economist was expected to give economic advice and leave social and political systems to others. Today, the economist is one of several emerging professions that are not related to any institutional or similar base. This new free range of professionals include people trained in law, medicine, accounting, urban planning, and many other fields. Their backgrounds are not as important as their roles. In some instances, they are called consultants. But in many cases they function as organizer, leader, and/or director of a myriad of new activities in cities or regions. These new practitioners assist in designing new computerized methods of producing farm products, designing economic and financial plans or software. They are powerful, unseen, and scarcely ever accountable. Yet, they form a new breed of "econocrats" that have increasing power over the destiny of communities of all sizes.

This new breed of professional is not bound by the past or by any form of professional ethic or institutional form. They are involved in almost every aspect of economic and social life. They make up the majority of senior-level officials in almost all government agencies. The econocrats are fashioning new community economic development agencies that rely more on technical than human expertise. The "econocrats" now have effective ascendancy in state governments as directors of bureaus of commerce, finance, or economic development. If we look more closely at the corporate sector, we see these well-trained econocrats organizing and maximizing economic resources as if people didn't matter. The econocrats have created a notion of progress through their manifestos such as *Megatrends* (1982) and *In Search of Excellence* (1982), combined with a whole group of futurologists who are recodifying both individual and institutional relationships.⁵ In fact, the econocrats view rural communities as commodities. These communities are used until they are no longer useful. As a result of their influence, cities or regions all over the world are uncertain of the loyalty of corporations, even corporate headquarters.

Econocrats are a special breed who view their activity as more important than the place or the employer. This new "professionalism" transcends the particular background of the person practicing it.

Korea has been slow to incorporate many of the econocratic skills. In essence, tension between community as human fulfilling space with personal relationships is gradually being replaced by a new economic base model which views community in terms of its output rather than its processes. This change is troublesome because it fragments rather than integrates communities within the nation. Yet it is increasingly obvious that the communities that possess information resources and not those that recruit new factories will become the dominant communities of the future.

Uncoupling Regional and Community Roles

Cities, as discussed earlier, were marked by the firms and the transportation or resource infrastructure that inhabited them. That is no longer true today. Firms are footloose to an extent than they never were in the past. This footlooseness is manifest not only in the way the firm utilizes its physical and financial assets but the way in which human assets are associated with the organization. Not only has work changed but the relationship of the worker to the work has changed. The labor force, as many analysts have shown, is increasingly in the service sector rather than the production sector.⁶ Service work is not only work performed in restaurants and among retailers, service work is now the dominant form of production.

An interesting and provocative aspect of this transformation has been the need for many workers to mark the place — a lifestyle area or rural, beach, or urban inner city — as the boundary of their profession. As a consequence, firms have moved to the workers or the workers have increasingly moved the work to wherever they choose to be in the world. In a real sense, the old attachment of firms to places has been replaced by a new attachment of skilled individuals to certain places. A rising number of professionals are opting for non-metropolitan environments. It is this professional talent that can form the base for economic revitalization. A new form of industrial recruitment is based on attracting skilled people to a locality rather than attempting to attract firms to new localities. This change in the nature of firm development is a signal to look to human capital in new ways in the development process. Rather than viewing humans as the victims of industrial forces, a different paradigm might be put in place that views human intellectual wealth as a new international commodity. This view of people in relationship to forming their environment rather than being victimized by it radically alters the perspective of the role of regional development. That is, we have to start about building an infrastructure for people as deliberately as we build an infrastructure for industries.

The Shape of Things to Come

The above factors influence the scale and scope of the regional development. Regions in Australia and all over the world are reacting to forces that are rapidly transforming what we see and what we do. This new template is the one from which new industrial forms will emerge. It is these new forms that education must take into account to become a new agent of regional economic development. The shape of the social system that will emerge is already outlined by current trends. Harlan Cleveland (1987), a recog-

nized authority on development trends, points out that the future is already here with respect to the dominant forms of economic activity. Nearly 50 percent of the developed world's labor force will be in the knowledge sector in only a few years hence in 2000.⁷ In essence, the shape of things to come is already here. As Table 2 shows, Korea lags far behind its competitors in the transition to an information society.

Table 2

Advanced Industrial Employment by Sector

	<u>Year</u>	<u>Information</u>	<u>Service</u>	<u>Manufac</u>	<u>Agric</u>
Japan	1960	17.9	18.4	31.3	32.4
	1975	29.6	22.7	33.8	13.9
U.S.	1970	41.1	24.1	31.5	3.3
W. Germany	1978	32.2	25.9	35.1	5.8
Korea	1980	14.6	22.4	29.2	24.0
	1983	16.6	29.4	28.5	25.6

Source: *Realigning Korea's National Priorities*, p. 86.

The real issue is how regions can begin to shape their destiny by utilizing new capacities of telecommunications and knowledge into a new set of natural resources that can provide all areas with that ability to deal effectively in a global economic order. The components of this system are described in the following sections.

Research: The Central Industrial Form for Korea

Research is now an industrial form. In fact, research is the leading industry in most of the United States and has been for many years. As John McHale (1982), author of *The Changing Information Environment* shows, information is limitless and expandable.⁸ In fact, research expands as it is used. This, in turn, creates whole new industries based on the pursuit of knowledge. New industries are created to exploit scientific research, technology transfer, biotechnology, computer software, and the like. These new industrial forms have no conceptual or physically boundaries. This means Korea's rural communities are now competing for becoming headquarters or the central locations for many emerging industrial areas. They have no opportunity boundaries. Castells summarizes the new perspective as follows:

The most direct impact of high technology on the spatial structure concerns the emergence of a new space of production as a result of two fundamental processes: on one hand, high technology activities become the engine of new economic growth and play a major role in the rise and decline of regions and metropolitan areas, according to their suitability to the requirements of high tech production; on the

other hand, the introduction of new technologies in all kinds of economic activities allows the transformation of their locational behavior, overcoming the need for spatial contiguity.⁹

Thus, by the use of information technology, firms are able to concentrate functions of the organization while simultaneously dispersing the total organization by locating various parts of its activities in geographical locations, like the West Coast of Korea, that are best suited to each respective function or the organization's overall strategic goals. Some scholars have applied this insight to inter-metropolitan location decisions, and some to intra-metropolitan location decisions.

In essence, we have entered an era in which research is the base for a totally new central industrial system that is not an adjunct to industry but as a new industrial activity. This activity depends on crossing all economic frontiers local, state, and national, physical and intellectual.

Knowledge Institutions: The New Engine for Economic Development in Korea's West Coast

With the rise of a knowledge society, the role of all institutions is changing. The role of universities is most challenged in this context. Universities were once the custodians of knowledge. Now universities are the propagators and developers of new industrial wealth. The university is the center of economic development. It must be seen as such. University resources are being harnessed as part of economic development schemes and programs all over the nation. Despite the purported "footlooseness" of high-technology industries, such industries have in fact emerged in certain key geographical regions, the most famous of which is in Santa Clara county in California ("Silicon Valley"), Cambridge, Massachusetts (USA), and Sophia Antipolis, France. Worldwide, the development of high-technology regions has been rather uneven, with the result that much debate has emerged over just how feasible it is for more than a small number of such regions to thrive. The phenomenon of high-technology regions has once again raised the theme of industrial concentration into prominence. Given the evidence of some urban areas emerging as clear leaders in high technology, and given that early entry into the use of such technology may provide a competitive economic edge to those urban areas, some commentators have argued against the view that the wide uptake of high technology will diminish the importance of geographic location for industries. As a result, the development of the West Coast must incorporate a major university on the western model as its core. The idea that new technology is likely to entrench the dominance of a handful of principle world cities is now quite established in the literature. As Table 3 shows, research and development investment remains too low for Korea to play a major role as a technology competitor.

The existence of high-technology regions is required because, as *Realigning Korea's National Priorities* notes,

Priority should be given to the development of technologies that will eventually help future industrial development. Science and technology policy should be linked to the other policy objectives such as the promotion of . . . balanced regional development.

Table 3

Trends in Korean R&D Investment as Percent GNP

	<u>1980</u>	<u>1982</u>	<u>1984</u>	<u>1986</u>
Government R&D	.58	.56	.45	.52
Private R&D	.28	.53	.99	1.47
Gov:Priv	68:32	52:48	32:68	26:74

Source: *Realigning National Priorities*.

Saxenian similarly views the parameters of high-technology regions as: (1) a high-caliber research university to ensure a science-base and a supply of scientists and engineers; (2) an ample supply of venture capital to fund new firms; (3) public investment devoted to research and procurement of new technologies; (4) a quality of life able to attract and retain footloose highly qualified professionals; (5) the absence of trade unions; (6) an industrial park to house start-up firms; and (7) adequate infrastructure to ensure efficient transportation and communication linkages. Saxenian observes,

The underlying message — though rarely stated — is that once these prerequisites are assembled innovation and growth will follow. Like a souffle which exceeds the size of the initial ingredients, a region endowed with the proper mix of institutional and economic resources will be the lucky recipient of rapid high tech growth.¹⁰

Universities in California, North Carolina, and, more recently, Texas are now famous for their role in stimulating the "souffle" of economic development for their regions. Europeans and the Japanese have very quickly copied this pattern with even more dramatic results. In almost every advanced industrial nation university, resources are being used directly to sponsor activities as wide-ranging as the development of science or industrial parks, the operation of small business incubators, and the direct development of new firms. First, it means that the university is no longer an innocent or neutral bystander in the regional development process. University involvement with an area or community can have a marked impact on a rural community's economic survival. Second, the most important aspect of the growth in the education sector is the significance of the use of knowledge resources as basic infrastructure for economic development.

Information as an Industrial Product

Information is the most widely available and the most difficult product in the world today. There is plenty of information in the world. In fact, industrial problem-solving is now done on a worldwide basis.

Engineering projects now use the skills of the best engineers all over the world rather than concentrating on the internal skills of a single firm. For example, Boeing Aircraft can use engineering talent

from an international pool to develop components of its new commercial aircraft rather than depending entirely on a large internal staff of engineers with total capacity to develop all of the complex components of a 747. In essence, there is a worldwide storehouse of knowledge on almost every subject and a control system to facilitate its exchange. Harlan Cleveland observes,

The ultimate limits of growth of knowledge and wisdom are time (time available to human minds for reflecting, analysis, and integrating the information that will be brought to life by being used) and the **capacity** of people— individually and in groups—to analyze and think integratively . . . the capacity of humanity to integrate its collective experience through relevant individual thinking is certainly expandable . . .¹¹

As we approach the new century, the issue for regional development will be how to improve the information capacity of the most remote villages and arrange access to new information on a range of topics not available before. This is not to say that certain human process skills will not be important. However, the leading information-gathering and dissemination skill that was the central resource of the educational institution may become less important.

Shaping the Future of the West Coast of Korea

West Coast Korea must begin to fashion new perspectives on its role in regional economic development. These perspectives will shape the destiny of Korea as well as much of Asia.

1. Regional Development for Global Economic Development

The West Coast must become the international market developer and not merely a link to the international corridor of economic development. That is, the West Coast must globalize as the gateway international region for Korea and the Tianjin region of China. The West Coast's information center is building the technology base for the nation, as shown in Figure 3.

2. The West Coast must now be at the Center of Regional Development

The core infrastructure of every region will be its higher educational system. For too long we have built education on the farming model. That is, at some point education ended and work began. Now education in an information era becomes a major technological tool and a requirement for participation in the economic system. Everyone will have to have access to education on both a formal basis and a non-formal basis. Therefore, higher education will have to re-think how it offers or packages knowledge. The course is an outmoded delivery vehicle. The new modes may require the introduction of existing technologies into new delivery modes such as cable television. New forms of education on demand need to be designed so that adults can constantly learn and plug themselves into the world of knowledge as part of their work rather than separate from it. More education will have to be delivered at the times and places people need it, using the best available information. For example, surgeons are now able to simulate

Figure 3

Support Systems Required for Advanced Technology Development

<u>Support System</u>	<u>Research</u>	<i>Stages of the Development Cycle</i>		
		<u>Development</u>	<u>Diffusion</u>	<u>Production</u>
Information Communications Strategic relationships	Social interactions library and database	Conference facilities	Innovation centers	Publications Media support Commercial Marketing
Human resources	Research scientists Inventors	Skilled technicians	Entrepreneur venture capitalists	Top management skilled and flexible
Education and research facilities	University or Research Institute	Research labs	Conference facilities	Community/ Vocational/ Technical College
Environmental quality	High-quality houses and recreation areas	High quality recreation and cultural areas	High-quality living and working envir.	High-quality work facilities and equipment
Business and community institutions	Contracts from large firms	Venture capitalists for start-up firms	Entrepreneurs and local social network	High-tech specialists
Government	Government contracts available	Joint-venture technology companies	Information services	Offset policies
Finance	Research grants	Private investment	Investor consortia	Institutional finance
Physical infrastructure	Specialized infrastructure in support of technology	Research facilities accessible to local investors	Fibre optics or related transmission services	International airports Toxic and scientific waste systems
Enterprise facilities	Research Institutes, Universities	Incubator buildings	Innovation centers	Technology and/or business and science parks
Community facilities and support	Good community facilities	Regional recreational, cultural, and social facilities (e.g., golf, symphony, sports, etc.)		Specialized commercial and professional services
Technology image	Technology Publications Name Status	Environmental quality reputation	Designation/or reputation for specific technology	Top-quality high-tech firms
Planning and development regulations	Controls related to industrial requirements	Provision of research and testing areas	Designated mixed-use areas	Regional technology strategy

operations on patients before the operation, using knowledge and techniques gathered from international data files on similar patients. This is learning interactively! Already, many educational institutions are using advanced databanks to assist people learn about international finance and urban economics. Regions with good education/information interfaces will have worldwide competitive advantage.

3. Institutions are Regional Economic Engines

In the near future, there will be no region with international potential that will not be without a research park. The research park will be seen as so central and integral to the institution that many older institutions will re-locate in order to develop such facilities. The reasons for this are very clear. New industries will emerge from new information and new ideas. The university or technical institute will be the new *natural resource base*. Creative human energy is already critical to regional development. As a result, it is imperative that the West Coast region must make the best interface between the development of new knowledge and its transformation into new or revised products or services. Education will be a critical vehicle and not an idle bystander. Education becomes the resource for economic development.

4. Regional Development of the Next Century will be Based on Recruiting People

The old model of "smokestack chasing" is bankrupt. Yet regional development specialist continue to promote it. It is clear from the previous discussion that regional development will be based on increasing the human resource pool and not the industrial pool. The question is how? The answer to this is that the best way to increase the pool is both to recruit new human resources and to develop the existing human resource base. As a result, building better communities that meet international standards in the Inch'on region will be essential to the development of the nation and the region.

These people start firms and tend to maintain them at the point of origin. Second, higher education is the vehicle to link both individuals and institutions to the entire world knowledge and market system. The intellectual, social, and information infrastructure of higher education can form a new infrastructure for international connections beyond any other institutional device. Finally, higher education can keep human resources fresh and vital so that the people in a region are able to adapt to international and local conditions early and re-train or develop new skills valuable to the international marketplace. In essence, the world comes to or is created by the human resources in the region.

5. Research must be a Central Regional Development Tool

For far too long, educators have eschewed applied real-time research as a useful tool. In part, it has been the result of the old research paradigm which was based on assessing what transpired in the past. A new "real time" research paradigm is emerging that emphasizes obtaining information and organizing information for decisionmaking and international trade. This research model is a necessary

adjunct to a development approach: a practice that is based on assisting groups make decisions based on the best available information in the world.

Conclusions

There is a new challenge facing Korea's West Coast. The challenge is quite simply whether the nation wants to build from its old base or meet the challenges of becoming part of shaping the future or be shaped by it. This is a difficult challenge since the scope moves beyond the territorial and conceptual limits that formed the field of regional development. The new regions will liberate people and firms from places. Therefore, regional development will create regions and communities to offer new skills and new tools and will thus become engaged in forging a new future.

This will only occur by reconceptualizing the issues and designing a new paradigm for regional development to proceed. Modernity is here. Modern life has not solved all of Korea's problems. In some respects it has created new and more difficult problems. The direction of change is not toward re-establishing the rural past but toward *building a new future* for emerging regional economic systems for the West Coast as partners in the emerging global economy.

NOTES

¹*Realigning Korea's National Priorities.*

²*Ibid.*, p. 58.

³R. A. Walker, "Technology Determination and Determinism: Industrial Growth and Location," *High Technology, Space and Society*, M. Castells, ed. (Beverly Hills: Sage, 1985, p. 34).

⁴G. Gappert, "Urban Issues in an Advanced Industrial Society," *The Spatial Impact of Technological Change*, J. F. Brotchie, P. Hall, and P. W. Newton, eds. (London: Croom Helm, 1987, p. 22).

⁵J. Nisbett, *Megatrends: Ten New Directions Transforming Our Lives* (New York: Warner Books, 1982), and T. Peters, *In Search of Excellence: Lessons from America's Best Companies* (New York: Harper and Row, 1982).

⁶H. Cleveland, "The Twilight of Hierarchy: Speculation on the Global Information Society," *International Journal Technology Management* 2(1), 1987.

⁷*Ibid.*

⁸J. McHale, *The Changing Information Environment*, Boulder, Colo.: Westview Press, 1987.

⁹M. Castells, "High Technology, Economic Restructuring and Urban-Regional Process in the United States," in *High Technology, Space and Society* (Beverly Hills: Sage Publications, 1985, p. 12).

¹⁰A. Saxenian, *The Cheshire Cat's Grin: Innovation, Regional Development and the Cambridge Case*, Working Paper No. 487 (Berkeley, Calif.: Institute of Urban and Regional Development, University of California at Berkeley, 1989).

¹¹H. Cleveland, *op. cit.*, p. 49.

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