

THE ROLE OF UNIVERSITIES IN LOCAL ECONOMIC DEVELOPMENT: THE CASE
OF IZMIR UNIVERSITY OF ECONOMICS

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ABSTRACT

THE ROLE OF UNIVERSITIES IN LOCAL ECONOMIC DEVELOPMENT: THE CASE OF IZMIR UNIVERSITY OF ECONOMICS

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This thesis reviews the concepts and theories related to the assessment of the effects of a university on the local economy where it is located. The theories of the methods of impact analysis and a literature review have been presented. A case study is conducted to assess the two economic functions of Izmir University of Economics in relation to local and regional economic development. The first function is associated with the University's direct and indirect impact as an economic force in Izmir Metropolitan Area. Through the application of an economic impact analysis, direct and induced effects of the University's very presence and Keynesian type income-expenditure multipliers have been estimated. A number of assumptions have had to be made in order to reach some concrete conclusions. Whenever these assumptions occur, they have been clearly detailed. Next is presented the knowledge impact of the University via introducing the role the University plays in local development by enhancing local human capital base, engaging in contract research, establishing partnerships in regional networks, encouraging local entrepreneurship and fostering the formation and development of start-up firms. Hence, it has been concluded that Izmir University of Economics is a prominent economic force in local income and employment creation as well as a significant knowledge node in regional networks.

Keywords: university impact analysis, regional income multipliers, entrepreneurial university

ÖZET

UNİVERSİTELERİN YEREL EKONOMİ ÜZERİNDEKİ ETKİLERİ: İZMİR EKONOMİ UNİVERSİTESİ ÖRNEĞİ

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Bu tez, üniversitelerin buldukları bölgeler üzerindeki etkilerinin değerlendirilmesinde yararlanılan kavramları ve teorileri incelemektedir. Tezde ekonomik etki analizlerinde kullanılan metotlar ve bir literatür taraması sunulmuştur. Yerel ve bölgesel ekonomik gelişme ile ilgili olarak, İzmir Ekonomi Üniversitesi'nin yarattığı iki ekonomik etkinin değerlendirilmesi amacıyla bir vaka çalışması yapılmıştır. İlk etki, üniversitenin ekonomik bir güç olması dolayısıyla İzmir Metropolitan Alan üzerinde yarattığı doğrudan ve dolaylı harcama etkileri ile ilgilidir. Ekonomik etki analizi uygulanarak üniversitenin varlığının yarattığı doğrudan ve dolaylı gelir etkileri ve Keynezyen tipi gelir-harcama çarpanları tahmin edilmiştir. Bu çalışmada somut sonuçlara ulaşabilmek amacıyla bazı varsayımlar yapılmıştır. Bu tür varsayımlar çalışma boyunca açıkça belirtilmiştir. Bunun ardından, üniversitenin yerel kalkınmada oynadığı rol, yerel insan sermayesi tabanını geliştirmesi, araştırma sözleşmelerine dahil olması, bölgesel ağlarla ortaklık kurması, yerel girişimciliği desteklemesi ve yeni şirket oluşumunu ve gelişimini teşvik etmesi yoluyla ortaya konulmuştur. Bu sayede, İzmir Ekonomi Üniversitesi'nin hem yerel gelir ve istihdam yaratma sürecinde önemli bir ekonomik güç olduğu hem de bölgesel ağlarda önemli bir bilgi düğümü olduğu sonucuna varılmıştır.

Anahtar kelime: üniversite ekonomik etki analizleri, bölgesel gelir çarpanları, girişimci üniversiteler

To My Beloved Family and Dear Friends

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INTRODUCTION

An institution of higher education can play a significant role in local economic development. The very magnitude of the presence of a university has economic development implications for the region in which it is located. Contemporary universities are large complexes, which employ thousands of workers, occupy large areas of land and consume large budgets. In a given area, they are similar to a business complex, running specialized research centers, hospitals, residential accommodation, sports, catering and cultural facilities and sometimes associated with commercial ventures such as a research park. Consequently, even without a proactive, explicit role in promoting local economic activity, the results of its policies and decisions are likely to have large income generation and employment creation impacts on the local economy in which it is located. Thereby, this study aims to estimate the expenditure impact of Izmir University of Economics on the Izmir Metropolitan Economy in terms of income generation and employment creation.

The expenditure impact of a university on local income and employment can be assessed by analyzing direct, indirect and induced effects. The direct income effect of the university results from the expenditure made by the university for its operations and maintenance activities and from the expenditures of its students and visitors. Indirect effects are the new economic activities, which are triggered by the direct expenditures of the university, students and visitors. Indirect effects are mainly the consequences of spin-offs in demands that follow from the initial direct spending, thereby generating more economic activities. The benefits of indirect effects are reaped by other sectors of the economy, which are indirectly related to the university

as a result of the subsequent economic activities. Finally, induced effects are the result of the university's spending on wages and salaries that induce spin-offs or a continuous chain of proportionate re-spending according to the marginal propensity to consume. This induced effect is also known as "Keynesian multiplier process". Surprisingly, only a few university impact analyses have been carried on in Turkey and even those studies are far from incorporating the induced effects as they did not include an estimation of a Keynesian-type income multiplier. Thereby, contributing to the literature of university economic impact analysis in Turkey by estimating Keynesian-type income-expenditure multipliers for Izmir University of Economics has been another motivation for this study.

Today, contemporary universities act more like an entrepreneurial university as they engage in commercial activities, form partnerships with businesses and encourage entrepreneurship through incubation processes. These activities stimulate local economic activity and innovation through synergistic processes of collective learning. Hence, this study also assesses the knowledge-generating role of Izmir University of Economics and its implications for the development of the metropolitan economy.

This study is comprised of three chapters. Chapter one illustrates a theoretical framework for regional development, which is significant in assessing the role universities play in local and regional development. The first part summarizes some of the fundamental concepts of regional development and clarifies their association with universities. These concepts are learning regions, innovation and regional synergetic networks. The second part deals with some of the fundamental theories of

regional development, which are necessary in assessing the spending impacts as well as the knowledge impacts of universities. These theories can be summarized as the economic base model, the theory of localization economies and agglomeration economies, new industrial districts and flexible specialization, the product cycle model, the innovative milieu approach, entrepreneurship and regional development and the theory of regional networks.

Chapter two aims to conceptualize the role universities play in local economic development. In this chapter, first backward and forward linkages of the university with its local economy are discussed. Next is introduced the methodological approaches to expenditure impact analysis. These approaches are the Keynesian Income-Expenditure Approach and the Input-Output Approach. Then, the weakness of regional multiplier analysis is discussed. Following that section, a brief literature review of the university economic impact analysis is presented. Finally, knowledge impacts of universities on their local economies are assessed. The knowledge-generating role of the universities includes developing human capital, establishing university-business partnerships and engaging in entrepreneurial activities and consequently stimulating local and national economic development.

Chapter three is basically a case study, which illustrates some of the backward, or expenditure linkages between Izmir University of Economics and Izmir Metropolitan Area in terms of local income generation and employment creation for the fiscal year 2004. The methodology used in this study is the model developed by Huggins and Cooke (1997) to measure the economic impact of Cardiff University on the local economy, which is indeed a development of the model configured first by Bleaney et

al. (1992) for Nottingham University and then by Armstrong et al. (1994) for Lancaster University. The induced impact of Izmir University of Economics on the metropolitan economy is calculated in terms of gross local output of the area and local disposable income of the area.

Data on university expenditures have been extracted from the University's financial statements for the fiscal year 2004 to estimate the direct and indirect effects of the University's expenditures on staff salaries, wages, goods and services. Moreover, all the invoices were examined to determine the proportion of goods and services purchased in Izmir Metropolitan Area by the University.

To estimate the student expenditure impacts and the proportion of student spending in Izmir Metropolitan Area, a survey of 200 students has been undertaken. Another survey has been conducted to 80 academic and administrative staff of the University to determine the percentage of their spending in Izmir Metropolitan Area.

Using the survey results and the data extracted from the University's financial statements, the induced effects of the University's expenditures and five income multipliers have been estimated. The estimated multipliers are the basic Keynesian multiplier, gross local output multiplier, local disposable income multiplier, expenditure base multiplier for gross local output and expenditure base multiplier for local disposable income. All of the estimated multipliers have been greater than 1, implying that Izmir University of Economics has a non-marginal impact on the Izmir metropolitan economy.

Finally, the knowledge impacts of the University on its local economy are assessed. First, the role of Izmir University of Economics as an entrepreneurial university is discussed by introducing the Embryonix unit the university has institutionalized to foster local entrepreneurship and start-up firm formation. Afterwards, the role of the University as a knowledge node in regional networks is assessed by presenting the role the University plays in local development by enhancing local human capital base, engaging in contract research and establishing partnerships in regional networks, encouraging local entrepreneurship and fostering the formation and development of start-up firms.

Thus, as a large-scale consumer of inputs such as labor, goods and services and generators of outputs such as skills, know-how and local attractiveness, the university becomes a major factor in local economic development. Therefore, determining the expenditure and knowledge impacts of Izmir University of Economics on its local economy is prominent in acknowledging and assessing the local development dynamics of the city of Izmir and the future policies to be implemented by the local governments as well as the national government.

CHAPTER 1

A THEORETICAL FRAMEWORK OF REGIONAL DEVELOPMENT

I. FUNDAMENTAL CONCEPTS OF REGIONAL DEVELOPMENT

This chapter illustrates a theoretical framework for regional development. The first part summarizes some of the fundamental concepts of regional development and clarifies their association with universities. The second part examines some of the fundamental theories of regional development, which are prominent in assessing the role universities play in local and regional development.

A. Learning Regions

Learning economy can be defined as an economy where the ability to learn is crucial for the economic success of firms, regions and national economies. In this context, “learning” refers to not only getting access to information, but building new knowledge, competence and skills as well (OECD, 2000; 124). Learning economy emphasizes the high rate of economic, social and technical change that underlies continuous formation and destruction of specialized knowledge. Modern learning economies are characterized by a very high rate of knowledge creation and destruction; of intense learning and forgetting (OECD, 1996; 14).

In analyzing learning economies, it is important to make distinctions between information and knowledge, and between different kinds of knowledge. Information is codified data, which can be sent between economic agents. Knowledge is more

complex, as it is not comprised of only accumulated information. In a categorization made by OECD (1996), knowledge is differentiated into four types: know-what, know-why, know-how and know-who. Know-what refers to knowledge about facts and data, whereas know-why refers to scientific knowledge of the principles and laws of nature. These types of knowledge can be codified and measured. On the other hand, know-how refers to skills and capability to do something and know-who involves information about who knows what and who knows to do what and refers to the formation of social relationships, co-operation and communication with different kinds of experts. Know-how and know-who types of knowledge are socially embedded knowledge, which are typically obtained in social practice and cannot be transferred easily through formal information channels. As the learning economy develops know-how and know-who types of knowledge become more prominent (OECD, 1996; 12-13).

In the learning economy, the basic learning agent is the individual. Much of the individual learning takes place in firms and the firm itself has become a learning agent. The firm in the learning economy can be viewed as a knowledge creating entity and the capability to create and utilize knowledge can be viewed as the most important source of competitive advantage for an increasing number of firms. Thus, firms increasingly involve in co-operative interactions with other firms and form networks with customers, suppliers and knowledge institutions in competence building. *Knowledge institutions* such as universities, research centers, technological service organizations are important elements of the knowledge infrastructure and can be regarded as the third type of learning agent in the learning economy (Gregersen and Johnson, 2001; 5).

The work on the learning economy has its parallel at the regional level in the literature on learning regions. The paradigm of learning economy is highly dependent on localized or regionally-based sources of knowledge and learning. The social nature of learning and innovation necessitates that these processes work best when agents involved are close enough to allow frequent interaction and effective information exchange. The regional level is critical because the factors of space and proximity contribute to tacit knowledge and regional communities that share a common knowledge base can sustain innovative capabilities. Hence, universities, research centers, telecommunication networks, libraries, databases, etc. are important agents of the regional knowledge base, which facilitate the formation of the learning region (Gregersen and Johnson, 1996; 481). Spatial proximity facilitates close, face-to-face interactions. Both formal and informal interaction networks foster 'learning through interaction'. Thus, firms clustered in the same region often share a common regional culture that can help them build up a common language or code of communication, which can facilitate social learning. Common code of communication can be further supported by the creation of regional institutions, which help produce and reinforce a set of rules and conventions governing firm behavior and interactions (Wolfe, 2002; 5-6).

The modern learning region is based on information and communication technologies, which have reduced the costs of storing, handling, moving and combining information and have made different kinds of networking possible. This has made new combinations of knowledge and interactive learning possible. At least four kinds of learning can be identified in learning regions: *interactive learning*, *organizational learning*, *institutional learning* and *learning by learning*. *Interactive*

learning is the process of interaction between individuals, firms and institutions, which integrates the knowledge required for the production systems to run smoothly. *Institutional learning* means (in the learning economy, formal institutions include governmental organizations, development agencies, associations, laws and informal institutions include values, routines, codes of conduct, customs, trust, etc.) the capability of institutions to adapt their structures and their objectives, and regenerate themselves in line with the changes of the environment. *Organizational learning* is the process of learning where an organization acquires the know-how associated with its ability to carry out its collective activities, not only by the individual members of the organization but by the aggregate itself. *Learning by learning* is the process of improving skills linked to learning (Maillat and Kebir, 2001; 262-266).

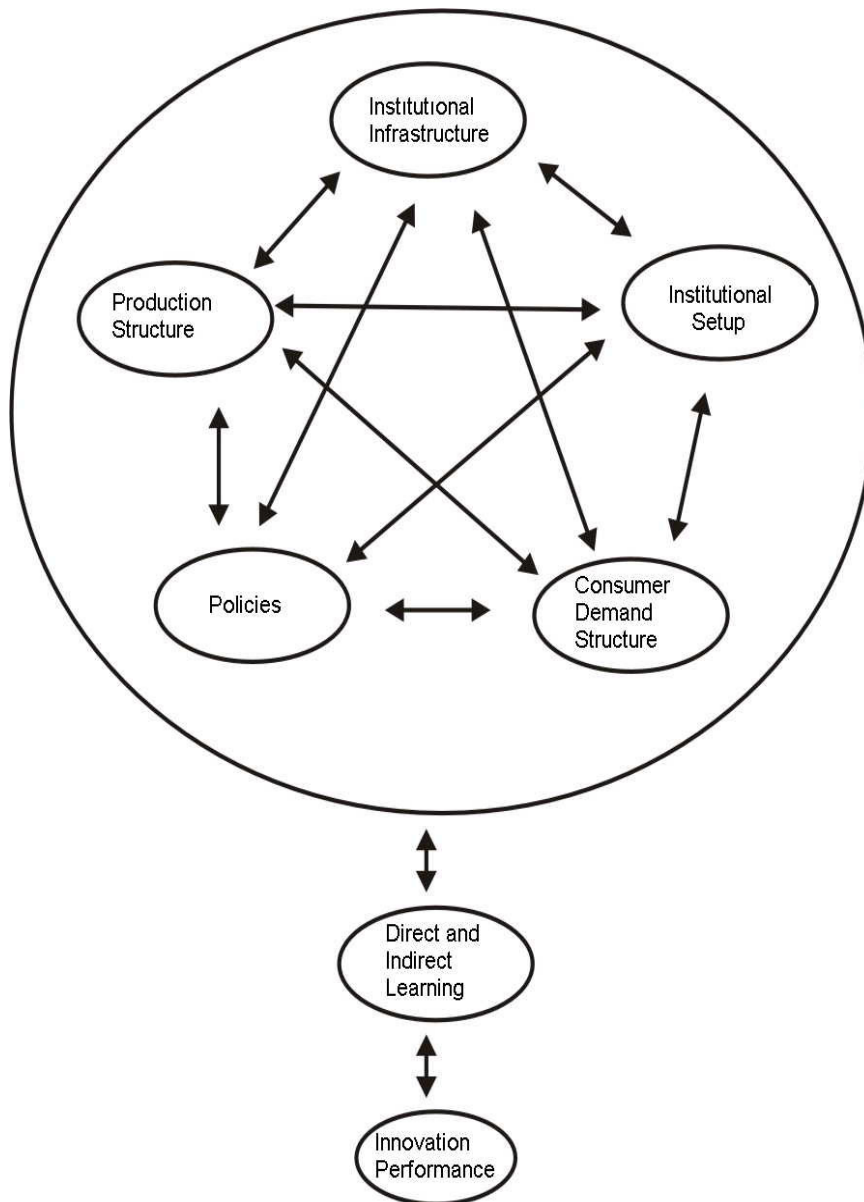
The literature on learning regions contains several ambiguities that have not yet been fully reconciled. In the North American context, learning regions are associated with the presence of a dense network of research institutions and universities and the broader set of social and institutional infrastructure that attract highly skilled workers into the region. In the European context, the analysis of learning regions focuses more on the contributions that social capital and trust make to support dense networks of inter-firm relationships and the process of interactive learning. From this perspective, the social and cultural context of the research infrastructure and firm networks are more critical for innovation than the institutions themselves (Wolfe, 2002; 8). In this sense, learning regions facilitate innovation via co-operation, network formation and interactive learning between individuals, firms and institutions.

B. Innovation

Simmie (1998) defined innovation as the commercially successful exploitation of new technologies, ideas or methods through the introduction of new products or processes, or through the improvement of existing ones (Simmie, 1998; 1262). Innovation is the introduction of new knowledge, or new combinations of old knowledge into the economy. Thus, innovation can be regarded as “a result of learning”. Learning leads to new knowledge and entrepreneurs use this knowledge to form innovative ideas and projects. That points out a distinction between production of knowledge and utilization of knowledge. The ability to utilize existing knowledge is an integral part of innovation (Gregersen and Johnson, 1996; 480).

Innovation occurs in small and medium-sized enterprises (SMEs) and inside large hierarchies, but it also thrives in interactive co-operative structures with a network character (Lambooy; 2002; 1020). Within this kind of structure, innovation is mostly an interactive process between firms and the basic science infrastructure of the region, between the different functions within the firm and between the firms and the wider institutional milieu that leads to collective learning (Morgan, 1997; 493). Hence, the geographic concentration of rival firms would enhance the innovation potential of the region through such mechanisms as a fast diffusion of technologies, higher quality supplies, and collective funding of training and research (Sennett *et al.*, 2002; 52). Accordingly, innovation is a collective learning process that requires the interaction of many agents.

FIGURE 1: Main Factors Affecting Innovation



SOURCE: Gregersen and Johnson, 1996; 484.

In Figure 1, main factors affecting innovation are illustrated. A system of actors such as firms, organizations, government agencies interact with each other and innovate through collective learning. This interaction is influenced by the knowledge infrastructure, institutional set-up, specialization pattern, public and private demand structures, and government policies. Universities, the school system, education centers, research centers, libraries, communication networks and databases form the knowledge infrastructure and shape the innovation process. Institutions are a major partner of the interactive learning processes and play a central role in innovation as they act as a political and cultural entity that set up code of conduct, foster trust, and willingness to co-operate and facilitate network building among agents. Infrastructures, production structures, institutional set-ups, consumer demand and government policies are not independent explanatory factors for innovation performance. They are interdependent and they evolve in interaction with each other through the innovation process (Gregersen and Johnson, 1996; 484).

C. Regional Synergetic Networks

Krebs and Holley (2002) identified several general patterns associated with well functioning networks. A network is made up of nodes and links. Nodes can be individuals, groups or organizations that link together because of common attributes, goals or governance. Links are relationships, flows or transactions. Maintaining diverse nodes and connections is required for innovation in the networks. Robust networks have several paths between any nodes. Even if several nodes or links are damaged, other pathways serve for uninterrupted information flows. Some nodes called *hubs* are more prominent than others as they are critical to network health and

growth. Without an active leader who takes responsibility for building a network, spontaneous connections between groups emerge very slowly. A hub forms connections between the nodes and weaves the network. As the hub gains credibility in the community, it attracts more groups to the network. As the network grows, network weaver changes its role to being a network facilitator by creating new network weavers, who will eventually build and maintain the network. If the hub resists change, then the network may not transform from a single-hub community to multi-hub community. As the average time it takes messages to travel between two nodes decreases, the hub acting as a leader builds and coordinates links between nodes and the network builds bridges to outside networks that have both similarities and diversities, networks can innovate (Krebs and Holley, 2002; 3-7).

Specifically, regional networks are formed by actors, who have common aims and functions. Regional networks can be characterized by continuous exchange of information and learning, sustaining co-operation and partnership where values such as trust and sincerity form the basis (Harmaakorpi and Niukkanen, 2002; 5). The members of a network have different roles and complement each other's capabilities by sharing resources, pooling together their production capacities and purchasing power, thus achieving scale economies. Consequently, development of networks can improve the competitive position of SMEs and reduce the problems associated with their size through mutual help (Quandt and Pacheco, 2000; 3).

Regional networks carry the potential to create synergy. Synergy can be defined as the generation of new and valuable information through human interaction. Synergy is often seen in networks connecting individuals in many different organizations –

public, semi-public and private, non-profit and for-profit, large-scale and small-scale- within a system that encourages the free flow of information and through this, the process of innovation (Castells and Hall, 1994; 224).

Regional synergetic networks can be differentiated into regional synergetic innovation networks and regional synergetic cooperation networks. In regional synergetic innovation networks, knowledge is diffused in networks formed between and within the regional agents. In an environment where trust is the dominant factor, regional actors connect to each other, share information, form partnerships and cooperate. This synergistic process of collective learning may lead to innovative activities. Regions that engage in synergetic innovation networks can develop knowledge, capability and specializations in line with the regional potentials and help strengthen the formation of a regional identity (Quandt and Pacheco, 2000; 3).

Regional synergetic cooperation networks are fundamentally policy networks, formed by regional actors who are willing to share responsibilities in decision-making. Regional actors in these networks can be representatives of local, regional and national governments, regional development agency, trade union, chamber of industry, chamber of commerce, universities, research centers, firms and individuals. Policy networking allows these actors to participate in decision-making process and propose effective solutions to local and regional issues. This system of multi-level governance creates a synergistic learning process in solving regional problems (Schleicher-Tappeser *et al.*, 1997; 98).

II. FUNDAMENTAL THEORIES OF REGIONAL DEVELOPMENT

A. The Economic Base Model and Regional Multipliers

The economic base model is a demand-side model that transfers the demand-driven Keynesian model of national economy based on sources of income to the regional level. The model stresses the dependence of a regional economy on demands for the goods and services produced within it. If demand for a region's products grows, then this results with an indirect increase in employment in the supplying industries. This employment in turn generates income within the region in that sector, leading to an induced increase in demand for other goods and services through the multiplier effect (Malecki, 1991; 36).

Economic base analysis classifies all economic activity into either of two sectors; basic or export activity (B) and non-basic or service activity (S). The export sector produces in response to exogenous demand. Export activity includes goods and services sold outside the region, goods and services provided locally to people who travel to the region and capital flows which bring income to the region. Hence, a wide variety of economic activities qualify as basic including manufacturing plants, large regional shopping centers, universities, hospitals, airports, banks, hotels, insurance and other financial firms (Malecki, 1991; 35-36).

The service sector depends entirely on the size and performance of the basic sector and is composed of local industries, which produce goods and services that are consumed within the region. The two sectors together make up all economic activity.

In the basic sector, an increase in exogenous demand results with an increase in income as well as an increase in saving. Rise in income leads to an increase in demand for the goods and services produced by the local sector. At the same time, the level of saving rises in the region, stimulating new investment. This further increases the regional income. Briefly, the theory states that the growth of a region depends on the growth of its export industries, implying that expansion in external demand is the crucial initiating determinant of growth within the region (Richardson, 1969; 336-337).

The elements of base theory can be illustrated with the aid of a simple model. Let T be the total level of employment or income in the region, B be the employment or income in the basic sector, and S be the employment or income in the non-basic or local sector. Since local residents spend part of their income within the region, there is the induced effect, which supports jobs in the local market. This local activity is a ratio of basic employment.

$$T = B + S \quad (1.1)$$

a is the ratio of service employment to basic employment. Substituting equation 2 into equation 1 yields equation 3:

$$S = aB \quad (1.2)$$

$$T = B + aB$$

$$T = B(1 + a) \quad (1.3)$$

From equation (1.3), the regional multiplier can be calculated. The ratio of service to basic employment, a , which can easily be estimated at any point in time, plus the initial impact in the basic sector, is the value of the regional multiplier $(1 + a)$.

In general, multipliers are used for prediction of impacts arising from new economic activity. Hence, “impact analysis” involves a simple version of an economic base multiplier of a more complicated Keynesian multiplier. The estimate is then used to forecast needs for housing, schools and urban services. Yet, measurements and techniques used in the calculation of multipliers may lead to dissimilar results. Depending on both the basic industry and the region, the multiplier values may vary. Besides, it is important to note that multiplier effects do not take place all at once. Usually it takes several years before full multiplier effects are realized (Malecki, 1991; 36-41).

B. The Theory of Localization Economies and Agglomeration Economies

External economies arise as a result of the spatial proximity of related activities. Two sources of external economies of scale that depend on the geographical clustering of economic activity can be identified. *Localization economies* result from the geographical concentration of plants that have input-output ties with each other in the same industry (Armstrong and Taylor, 2000; 104). Marshall in 1890 pointed out that economies of localization occur because firms in the same region find it advantageous to cluster in the same region for several reasons. For instance, clustering facilitates the development of specialized inputs and services, provides a

pooled market of workers with specialized skills and enables firms to benefit from knowledge spill-overs (Maskell *et al.*, 1998; 9).

Agglomeration economies arise from the geographical association of a large number of economic activities, which need not be in the same industry. They arise as a consequence of the concentration of many facilities jointly serving different industries. These facilities include urban transportation and commuting facilities, well-organized labor markets and large pools of workers with different types of skills, the provision of social overheads and government services, legal, commercial and financial services, market-oriented activities such as service trades, cultural and recreational activities which attract highly skilled workers, and clustering of organizations which invest heavily in the search for new products and new processes (Armstrong and Taylor, 2000; 105). This type of spatial agglomeration is usually seen in urban regions.

Agglomeration of economic activities in a geographical setting is stimulated by local linkages between firms, customers, suppliers, sub-contractors, institutions and infrastructure within a geographic area, which give rise to economies of scale and scope. Economic agents prefer geographic proximity for several reasons. Geographical proximity facilitates firms to reach pools of specialized labor, specialize in production processes, benefit from scale economies and localized externalities by using public goods and services and shared infrastructure, enhance interaction between local suppliers and customers, share knowledge and find new markets for their products. Geographical proximity enables individuals to spend less

time and effort in job searching, reach out more and diversified products and satisfy their expectations of social, cultural and leisure activities (Kıymalıoğlu, 2004; 365).

Agglomeration is a powerful concept, which captures the idea that spatial change is conditioned on the past and accumulated spatial patterns. High productivity and profit advantages in large urban agglomerations attract new technologies and qualified labor force to the regions. Higher output in the regions leads to more investment in R&D. Polarization of technical progress leads to polarization of capital and labor. This polarization is further intensified by internal and agglomeration economies (Malecki, 1991; 85). In this sense, agglomeration of economic activities tends to be a process of cumulative causation.

C. New Industrial Districts and Flexible Specialization

Research on new industrial districts has its origins in the work of Piore and Sabel (1984) *“The Second Industrial Divide: Possibilities for Prosperity”*, on several successful clusters of SMEs in the “Third Italy”. Third Italy, refers to north-eastern and north-central regions of Italy, particularly Emilia-Romagna, Veneto, Trentino and Toscana. The new industrial districts of the Third Italy are dominated by small craft and artisanal firms, which proved to be world leaders in luxury apparel, furniture, machine tools and ceramics (Armstrong and Taylor, 2000; 293).

There are many similarities between the clusters in the Third Italy and Marshall’s 19th century industrial districts of England. Both are dominated by manufacturing SMEs and external economies arising from a local pool of specialized labor,

specialized services and subsidiary trade. However, new industrial districts have characteristics that go beyond the classic Marshallian districts. New districts have supportive social and cultural attributes, together with a network of public and private institutions which help the SMEs. New districts function within a much more highly globalized economic system where technological change has quickened dramatically and consumers demand ever-widening choice of differentiated goods and services. The characteristics of a supportive social and cultural system, a network of public and private institutions and external links to global markets make industrial districts 'new' (Armstrong and Taylor, 2000; 293).

Brusco (1996) analyzed Third Italy and identified three key factors that contributed to its success. According to Brusco, competition complemented by co-operation is the dominant factor in the success of the Third Italy. In addition to that, some level of conflict to prevent paternalism, as well as participation to share experience is necessary to ensure that the workers' capacity for invention is available to the firm. And finally, the third key factor that contributes to the success of industrial districts is the ability to connect two different kinds of knowledge; specifically the practical local knowledge and science (Brusco, 1996; 117).

In particular, the concept of industrial districts draws upon ideas from Post-Fordism. Piore and Sabel (1984) analyzed that usage of automation and robotics technologies in production processes has changed the production structure from "Fordist or mass" type of production to "flexible specialization" (Piore and Sable, 1984; 258).

TABLE 1: Contrasts between Fordist and Flexible Production Systems

	FORDIST PRODUCTION	FLEXIBLE PRODUCTION
THE PRODUCTION PROCESS	Based on economies of scale	Based on economies of scope
	Mass production of homogenous products	Small batch production
	Standardization	Flexible automation
	Large buffer stocks - inventory management	Immediate detection of defective parts - no stocks
	Costs of holding stocks	Immediate reject of defective parts
	Vertical integration	Quasi-vertical integration
	Resource driven	Demand driven
LABOUR	Single task performed by worker	Multiple tasks
	High degree of job specialization	Elimination of job demarcation
	No or little on-the-job training	Long on-the-job training
	No learning experience	On-the-job learning
	Emphasis on diminishing workers' responsibility	Emphasis on workers' co-responsibility
SPACE	Functional spatial hierarchy	Spatial clustering and agglomeration
	Spatial division of labor	Spatial integration or division of labor
	Homogenization of regional labor markets	Labor market diversification
	World-wide sourcing of components and subcontractors	Spatial proximity of vertically quasi-integrated firms
THE STATE	Collective bargaining	Local or firm-based negotiations
	Socialization of welfare	Privatization of collective needs
	The 'subsidy' state or city	The 'entrepreneurial' state of city
	Indirect interventions in markets through income and price policies	Extensive direct state intervention in markets through procurement
	National regional policies	Territorial regional policies
	Firm financed R&D	State-financed R&D
	Industry-led innovation	State-led innovation

SOURCE: Adapted from Malecki, 1991; 229-230.

In Table 1, fundamental differences between Fordist type of production and flexible specialization are summarized. Mass production of homogenous, standardized products forms the basis of Fordist production systems. In Fordist production systems, defective parts cannot be rejected immediately. This leads to loss of production time and holding buffer stocks. On the other hand, flexible automation technologies enabled flexible and small batch production of a variety of product types. This has made immediate detection of errors and defective parts possible. Thus, flexible specialization has reduced the need to hold large inventories and reduced time lost because of inventory bottlenecks.

In Fordist production systems, the organizational structure is a vertical hierarchy. As a result of the high degree of job specialization, each worker performs a single task. Workers' responsibilities are determined by strict rules. Consequently, there is no or little on-the-job training and learning. On the other hand, flexible specialization is a system where each worker can handle multiple tasks. Compared to Fordist production system, workers spend longer time periods on on-the-job training and are encouraged to have co-responsibility. Thus, all these factors increase the productivity of labor in flexible production.

Flexible specialization, which is the reflection of a world-wide change on the production system, necessitates that the government possess new roles. In Fordist production system, government intervenes to the markets by implementing several policies. However, government does not specifically implement policies to foster innovation. Contemporary means of governance necessitates that policies should be produced and implemented according to the needs of each region. Government

should implement policies that support the innovation and R&D activities in cities, techno-parks and techno-poles.

The concepts described above are the reflection of a holistic change that shapes contemporary economic, social and political life. The process of change, which has gained pace with technological progress has first shaped the economic system, and later the social, political and cultural system.

D. The Product Cycle Model

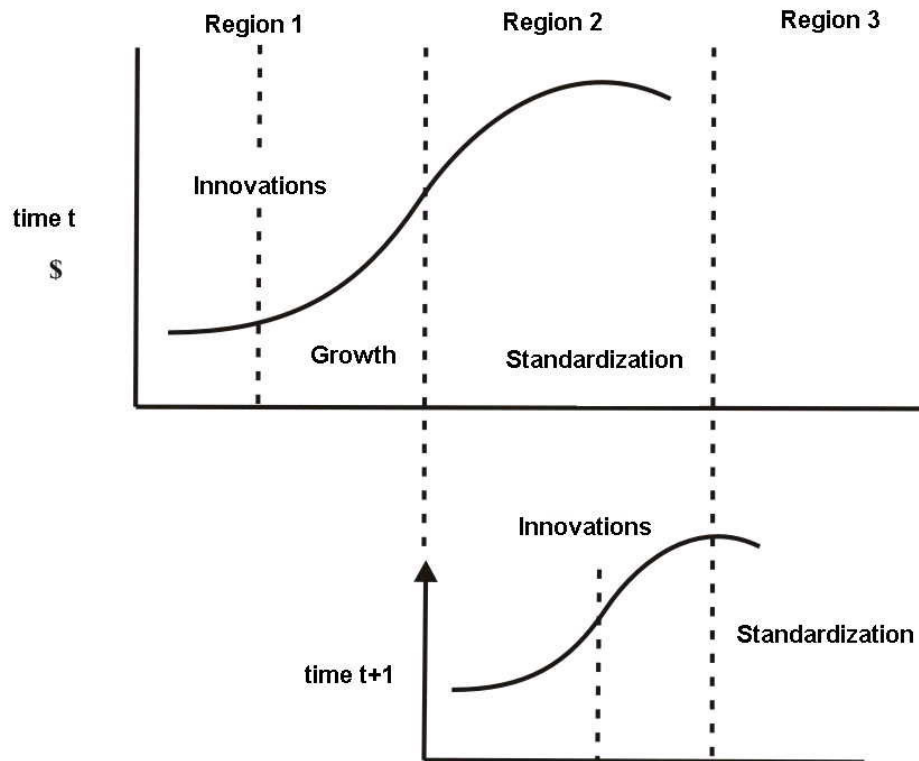
The product cycle model has been the dominant model in recent years for analyzing technological change and regional development. Product cycle model was first formulated by Vernon (1966) and was developed further by Rees (1979), Markusen (1985) and Hayes (1988) and its corollaries were named as the profit cycle, the innovation cycle and the manufacturing process cycle. These models analyze the typical pattern of a product's development from the R&D stage to market success to ultimate decline and replacement by new products (Malecki, 1991; 124).

According to Vernon, both industries and companies make profits when individual products succeed in the marketplace. A typical product (but not necessarily all goods and services) evolves through three distinct stages in its life cycle. Regions grow or become smaller in accordance with the stage their specialized product is going through. In Figure 1, the three stages of the model are illustrated. At the initial stage of the product cycle, some regions specialize on producing new goods. These regions possess advanced R&D knowledge, technological infrastructure and qualified labor force. Second stage is the growth stage in which sales increase by selling the product

in domestic as well as international markets. The third stage is the standardization stage, where production can be shifted from the original high cost region to lower cost locations. This phase is associated with Fordist mass production techniques. Starting from this stage, product ultimately declines as it can be produced on a global scale by employing unqualified labor. At this stage, lagging regions can dominate the market by benefiting from their advantage in lower wages (Rees, 2001; 97).

This whole process has an important geographical dimension because the different stages of product development can take place in different locations implying that roles regions play can change overtime. Regions can change their roles from being the recipients of innovations by branch plants to being the generators of innovation through indigenous growth. The innovation stage in particular needs a high input of R&D and is usually located in large urban agglomerations of developed countries. The standardized production phase of the product cycle can be transferred to low cost locations; abroad as well as down the urban hierarchy to rural areas. As production accumulates in Region 2, labor, local linkages and other external economies can build up there and as regional demand grows, industrial seed-bed effect can develop with the spin-off of small firms or through the immigration of entrepreneurs (Rees, 2001; 97-98). In Figure 2, it is illustrated that at time $t+1$, innovation has started to take place in production. Accordingly, innovation can be generated in other regions, given that stimulating conditions prevail (Rees, 2001; 98).

FIGURE 2: The Product Cycle Model



SOURCE: Rees, 2001; 97.

Analogous to product life cycle, Markusen (1985) has suggested a profit cycle model, which clarifies several of its points. The first stage is the “initial birth and design stage” of a product where profits are negative. The second stage is the “super profit stage” where the innovator holds a monopoly position and makes super profit. In the third stage, competitors enter the market and the profit per unit falls as output approaches saturation. The fourth stage is rather uncertain. In some industries, firms will be able to earn profits, whereas in others, competition eliminates high cost

producers. In the fifth stage, negative profits prevail where large corporations disinvest and small firms dominate the sector (Markusen, 1985; 29-35).

The Abernathy-Utterback model of innovation in industry is complementary, but focuses on the types of innovation that takes place at different points in the life of a product. In the early stages, product innovation is the main objective in order to patent products and derive monopoly profits. As the product is standardized for large-scale production, the need for innovation wanes relatively quickly. On the other hand, process innovation is crucial over a relatively long period. If process innovation is extended over a long time period, then some degree of standardization in production could be attained and production can be moved to regions with lower skilled workers (Malecki, 1991; 128).

Although the product cycle model and its corollaries do not provide universal applicability, they capture the skill and knowledge differences among economic activities and types of products. The product cycle model continues to be fundamental in business strategy, especially when considered as a succession of cycles as new products replace old.

E. The Innovative Milieu Approach

The innovative milieu approach was formulated to explain the “how, why and where” of new technology generation and is a sequential follow-on to product cycle theory. The evolution of work on the milieu concept has been linked to the

rediscovery of agglomeration economies, geographical proximity and technological innovation and how these led to new industrial spaces (Rees, 2001; 99).

Camagni (1995) defined the concept of *innovative milieu* as “a set of relationships bound in a geographical area which unites a production system, a set of actors, a system of representation and an industrial culture, which generates a localized dynamic processes of collective learning and which acts as an operator for uncertainty reduction in the innovative processes” (Lecoq, 2002; 3). Castells and Hall (1994) define *milieux of innovation* as the social, institutional, organizational, economic and territorial structures that create the conditions for the continuous generation of synergy and investments which would enhance this synergistic capacity (Castells and Hall, 1994; 9).

The innovative milieu can be seen as the “brain” of the local productive system as the cognitive actors are concentrated within. One of the features of an innovative milieu is that know-how can be developed independently, producing a specialized milieu. Successful regions specialize in one or more special techniques (integrated circuits, micromechanics) or of design intensive products (footwear, clothing, watches) that create competitive advantages. One other feature of innovative milieu is its ability to identify and formulate new projects in the light of available resources which can be mobilized. During the ideation phase, one or more actors assess their own resources and these resources are then matched to the opportunities arising in the technical milieu and the market for innovative projects (Maillat, 1996; 74).

Sweeney (1987) identified several factors, which make up the “innovative potential” of the region. These factors can be summarized as the sectoral and technological mix of the industry in a region, the strength of the engineering sector and information infrastructure, the technological orientation of the educational system, the dominance of employment in one or two sectors and the autonomy of decision-making in industries and infrastructure of a region (Malecki, 1991; 324). Quandt and Pacheco (2000) also pointed out several factors that foster the formation of innovative clusters. These can be summarized as;

- *financing opportunities* through the availability of seed, venture and investment capital, grants for training and R&D, government business support services
- *physical infrastructure* such as transportation, communication, power and water
- *quality of life factors* or the perceived benefits offered to entrepreneurs or upper segments of technical-scientific workers such as pleasant residential areas, parks, recreational facilities
- *a diversified economic base* comprising supplier and distribution networks, and specialized services
- *a favorable business climate*, usually associated with reduced cost of doing business due to low tax levels, limited labor union activity, and other costs such as wages, housing, food, transportation
- *the existence of champions* such as political or academic leaders who ensure determination in defining and pursuing objectives
- *recognition of the potential* that technology-based industries offer for regional development, and also actions to identify and take advantage of regional assets
- *a broad support base* for a common development goal in the region from different government levels as well as from the community, unions and local organizations

- *an entrepreneurial culture*, which is widely perceived as essential to create a dynamic business cluster; *strong linkages between the scientific and entrepreneurial community* and the establishment of a mutual partnership; *information networks* comprising formal and informal contacts as well as wider scientific, technological and business networks
- *marketing and image building* and promotion of the region's innovative image to attract and retain new investments, skilled workers and entrepreneurs.

Innovative milieu necessitates an entrepreneurial innovation process, where innovations are the product of entrepreneurial imagination. However, this entrepreneurial process does not refer to a single, heroic Schumpeterian entrepreneur, but rather to collective actions and a process of mutual discovery. In this sense, the entrepreneurial activity is a local process. Thus, the innovative milieu emerges as an “entrepreneurial cluster” (Lecoq, 2002; 5). This feature of innovative milieu has strong implications for entrepreneurship and regional development. Fostering entrepreneurial culture in regions is crucial for building innovative milieu.

Local institutional base is another factor affecting the innovative capacity of the region. In the broadest sense, the concept of “institution” in this literature refers to recurrent patterns of behavior-habits, conventions and routines. Conventions and routines help regulate economic life reducing uncertainty. Trust is another valuable resource for innovation and economic development. Social capital refers to features of social organization, such as networks, norms and trust that facilitate coordination and cooperation for mutual benefit and differs from human capital as it is transmitted

through cultural mechanisms. Thus, social capital is a vital component of innovative milieu and economic development (Morgan; 1997; 492).

In addition to conventions and routines, local institutional base incorporates institutions such as universities, public, private and semi-private research and development institutions, trade associations, chamber of industry, professional associations of engineers and regional development agency that form a local development network through which industry can reach academic and technical knowledge, technological infrastructure and qualified labor force easily (Kosonen, 2002; 2). Specifically, in production centers like technopoles, firms can form networks with each other, universities and research centers, and thereby exchange knowledge, collectively learn and innovate.

The final point to make for innovative milieus is that public policy is usually accepted as an appropriate vehicle to enhance such milieus. Governance at both national and regional level is necessary to nurture innovative environments, foster knowledge and technology infrastructure, establish institutional thickness, develop and strengthen local networks.

F. Entrepreneurship and Regional Development

Innovation and entrepreneurship are closely related concepts. Schumpeter (1942) defined entrepreneur as “the key agent of innovation”. For Schumpeter, entrepreneurial innovation included either introduction of a new good, introduction of a new method of production, opening of a new market, conquest of a new source

of supply of raw materials or development of a new form of industrial organization (Cooke and Morgan, 1998; 10). Garfield (1986) defined entrepreneur as someone who imagines and creates new opportunities or solves problems in a new way, or someone who develops a niche in the market or develops a strategy to meet some market need. Similarly, Drucker (1985) argues that an entrepreneur is a person who always searches for change, responds and exploits it as an opportunity. (McQuaid, 2002; 6, 12). In this context, entrepreneurship can be learnt through organized search for change and opportunities to carry on systematic innovation.

Entrepreneurship is more than self-employment, as it requires the element of growth that leads to innovation, job creation and economic expansion. Moreover, the concept of entrepreneur can be associated with risk taking, uncertainty, a willingness to not accept failure, personal and environmental factors such as family background, motivations, goal orientation, educational background, access to financial capital and other experiences (Rees, 2001; 102). Indeed, entrepreneurship is a local phenomenon and many regional conditions characterize an entrepreneurial environment including availability of venture capital and technically skilled labor force, presence of experienced entrepreneurs, proximity to universities and other R&D centers, accessibility of customers, suppliers, supporting services, transportation infrastructure usually associated with large urban agglomerations (Malecki, 1991; 330). Therefore, entrepreneurs, who can benefit from local information channels and utilize regional potentials and knowledge with social values such as resilience, diversity and creativity, can innovate.

The key player in regional development is the SME entrepreneur. Regional economies with a large proportion of SMEs have lower entry barriers to new firms. SMEs also play a significant role in innovation and smaller firms are particularly flexible because of less specialization and more opportunity for face-to-face contacts of economic agents. They are more able to adjust to rising demands both within and beyond regional markets for more varied, sophisticated and customized goods (Cecora, 2000; 86).

SME entrepreneurs differ from corporate firm entrepreneurs in several ways. Table 2 illustrates some of the basic differences between corporate executives and SME-entrepreneurs. The SME entrepreneur is irreplaceable as owner and ultimate authority in his own firm whereas the corporate executive is dependently employed and subjected to critical evaluation. The corporate manager receives a steady salary and sometimes fringe benefits. However, the firm's profits are at the full disposition of the SME-entrepreneur. Within a global economic framework, both corporate executives and SME-entrepreneurs must involve in cosmopolitan information networks to maintain technological know-how and innovate; yet despite to corporate executive, SME-entrepreneur remains essentially a non-global player. This is exemplified by the SME-entrepreneur's ties to the region as his production base. Flexible corporate management attempts to control world markets, whereas the SME-entrepreneur continually establishes or renews firm ties to the region, to the population, and to its political and economic institutions in the form of location-bound production factors such as real estate, equipment, permanent contracts with core personnel and long-lasting relationships of trust and collaboration with customers and representative of local business and public institutions. For these

reasons, SME-entrepreneur has become the key element theories and policies of regional development.

TABLE 2: Some Basic Differences between Corporate Executives and SME-entrepreneurs

<i>Corporate Executives</i>	<i>SME-entrepreneur</i>
Dependently employed (subject to critical evaluation)	Self-employed
Contractually fixed salary	Direct profit appropriation
Involved in cosmopolitan information networks and is a global player with a high degree of personal mobility	Involved in cosmopolitan information networks but is a non-global player with durable ties to the region
Attitudes influenced by self-identity as member of a global caste	Attitudes influenced by a strong local and regional identity
Actions characterized by weak identification with product/service and by strong interest in commercial and financial spot markets	Actions governed by strong identification with innovative product/service and by strong interest in reputation and durable working relationships
No or strongly mitigated risks to own private assets in case of business failure	High degree of risk to own private assets in case of business failure.

SOURCE: Cecora, 2000; 90.

Universities are one of the important elements that foster local entrepreneurial culture. Contemporary universities increasingly act as an entrepreneurial university and involve in innovative activities as well as new firm formation. Thus, the university support system for students, faculty investors and entrepreneurs has strong implications for fostering entrepreneurial culture and local economic and social development (Newlands, 2003; 6).

G. The Theory of Regional Networks

Cooke and Morgan (1998) defined networks as a certain form of regional governance and supportive institutional infrastructure, which foster interaction, sharing, co-operation and trust as a means of securing the economic co-ordination between firms, universities and regional authorities. Networking can take place at a number of different levels; between firms, between firms and public sector agencies, between firms and knowledge institutions and between regions (Cooke and Morgan, 1998; 17).

The main advantage of networks is the utilization of complementary resources, which an individual actor does not possess or do not have the resources necessary to bring about change. However, cost aspects are not the only stimulators of network formation. The partners in the network share the same knowledge infrastructure. Knowledge exchange and learning in networks form the basis of interacting in innovation process. Through the realization of synergy effects and strategic interests, agents aim to exploit economic potentials, which have remained under-utilized (Gal, 2002; 3).

Maillat (1996) defined innovative network as a co-ordinated but mixed group of actors with professional backgrounds (public laboratories, technical research centers, financial organizations, users and public authorities) who work together to design, develop, produce and disseminate production processes, goods and services, some of which will be a commercial transaction. It presupposes the existence of direct, non-hierarchical links between all the elements of the network. This co-operation

enhances creativity and diminishes the risks and costs associated with the innovation process (Maillat, 1996; 75).

The innovation network defined is different from those studied in industrial economics. Those networks are based on strategic agreements and co-operation is designed to solve a clearly identified specific problem. However, innovation networks have a less clearly defined objective and a greater element of uncertainty. In these networks, partners enter into a multifunctional process without knowing in advance what their individual costs and benefits will be. They join forces to develop a product or technique by trial and error method without being sure of its success. It is therefore crucial for the actors to have partners whom they trust. These innovation networks, which rely on a set of established professional and personal contacts, will only emerge under specific conditions. An innovative milieu is the appropriate framework for their formation, development and expansion. The milieu fosters the formation of innovative networks through the provision of relevant skills and the constitution of an implicit contractual framework. It acts as a negotiating structure, enabling the players to devise joint projects. In return, innovation networks enrich the environment and continually enhance its creative capacity (Maillat, 1996; 75).

Universities are an integral part of the local innovative milieu and regional innovation networks. Firms gain access to knowledge and technological infrastructure, academic knowledge and qualified labor force via universities. Firms co-operate with universities, use their knowledge base, and engage in collaborative research activities. Mostly supported by governments, techno-park or science park type of production centers established in university campuses are places where

university and business can form networks and collaborate synergistic process of collective learning and innovation (Kosonen, 2002; 2-3). Thus, university-business-government relations have taken on new forms, as universities have increasingly become a mechanism through which broad social and economical change towards a knowledge-based economy could be achieved.

Regional synergetic co-operation networks are also an important element of regional development. In this type of network, regional actors who are willing to share responsibilities in decision-making come together and form policy networks. In these networks, regional actors can discuss local and regional issues, participate in decision-making processes and propose solutions to local and regional problems. This system of multi-level governance allows flexible solutions to regional problems compared to national governments' top-to-bottom regional policies (Rydin, 1997; 158).

The interaction of local and regional networks into national and global networks is also included in the theory of regional networks. Regions connect to international global networks through linkages to intraregional networks and innovation potentials of regions are determined to a large degree by their integration into interregional innovation networks. SMEs that do not integrate into these networks would find it difficult to obtain new knowledge and utilize it in production processes (Gal, 2002; 3). In an age in which forces of globalization and localization complement each other, intraregional networks contribute regions to gain advantage by utilizing their indigenous potentials.

CHAPTER 2

UNIVERSITIES AS CONTRIBUTORS TO LOCAL ECONOMIC DEVELOPMENT

I. CONCEPTUALIZING THE ROLE OF THE UNIVERSITY IN LOCAL ECONOMIC DEVELOPMENT

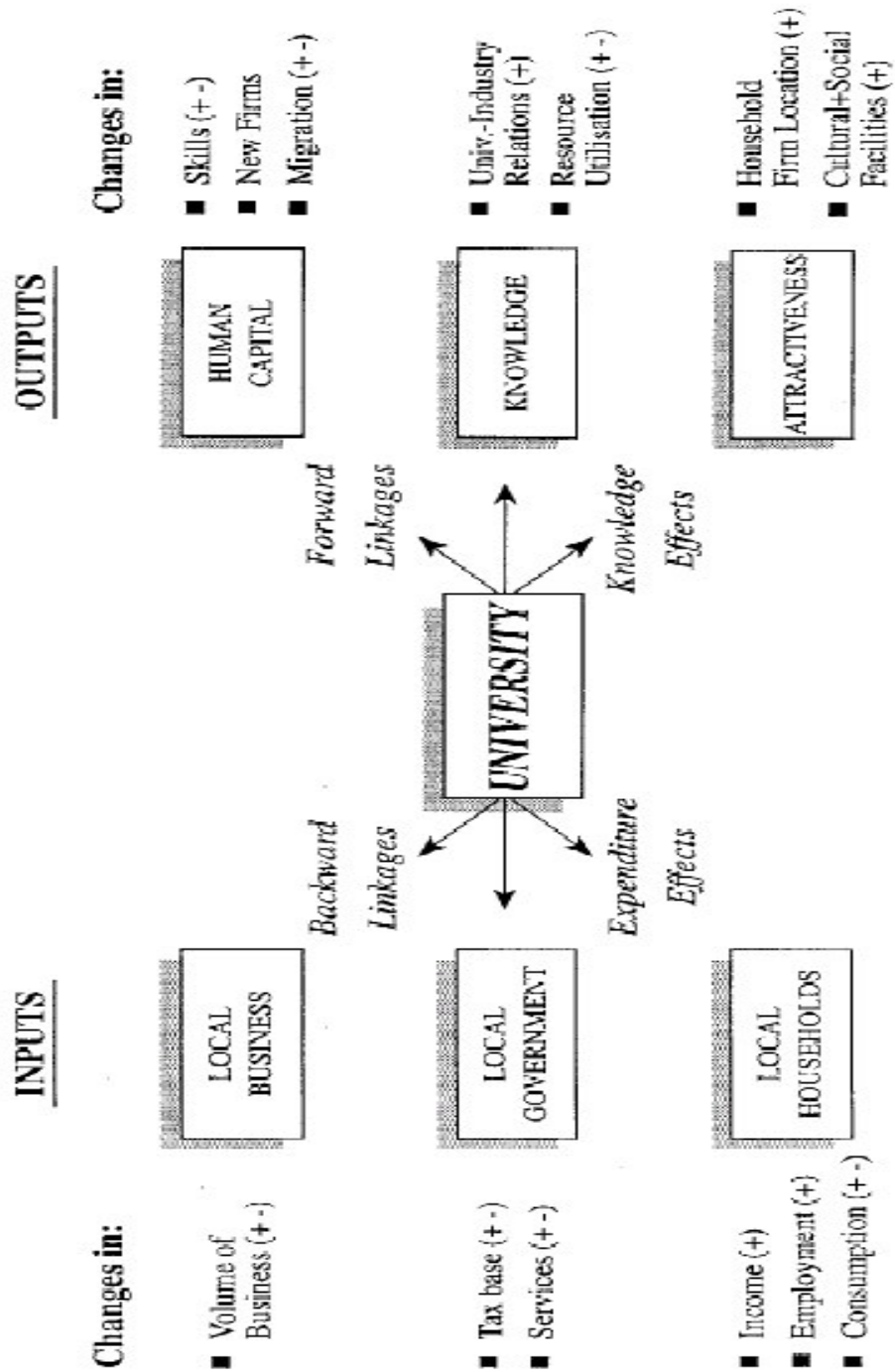
A. Backward Linkages of the University with its Local Economy

An institution of higher education can play a significant role in local economic development. The vary magnitude of the presence of a university has economic development implications on the region in which it is located. Contemporary universities are large complexes that employ thousands of workers, occupy large areas of land and consume large budgets. In a given area, they are more similar to a business complex, running specialized research centers and even hospitals, housing and residential accommodation, sports, catering and cultural facilities and sometimes associated with commercial ventures such as a science or a research park. Thus, as a large scale consumer of inputs such as labor, goods and services and generators of outputs such as skills, know-how and local attractiveness, the university becomes a major factor in local economic development. Even without a proactive, explicit role in promoting local economic activity, the results of its policies and decisions are likely to have large impacts on its local economy (Felsenstein, 1996; 1565-1566).

In order to analyze how universities contribute to local economic development, it is necessary to consider the potential backward and forward linkages between a university and its local economy. In Figure 3, these linkages are illustrated. The university is an organization that receives inputs in order to generate outputs. Inputs to university operation come from local households, local government and local businesses.

Backward linkages refer to the effects of spending by the university itself, university staff and students on income and employment in the local area. These backward linkages affect three areas and can generate both positive and negative outcomes. The university's effect on local households is generally positive, generating increased direct income and employment locally and also induced income and employment through a second-round process of spending and re-spending. The second area to be affected is that of local government. The effects on local government are rather mixed because while the increased employment and volume of local businesses can lead to a wider tax-base and greater revenues for the government, the presence of a university may increase the provision of public services and the expenditures of the local authority, thereby offsetting some of the positive effects. Furthermore, the additional pressure on local public services may lead to additional social costs such as congestion and pollution. Thirdly, the university has rather mixed effects on local businesses. Local businesses can benefit from supplying goods and services to the university. Meanwhile, the university may operate on such a scale as to compete with local firms in certain areas such as entertainment, food services, etc. leading to their eventual displacement (Felsenstein, 1996; 1568; Armstrong and Taylor; 2000; 18). These positive and negative changes

FIGURE 3: The Impact of Universities on the Local Economy Through Backward and Forward Linkages



SOURCE: Felsenstein, 1996; 1569.

in the local economy are represented by plus and minus signs in Figure 3. Multiplier studies usually do not take such negative effects into account.

B. Forward Linkages of the University with its Local Economy

The outputs of the university activity can be conceptualized as human capital formation, the production of knowledge and the creation of an attractiveness value. These represent the forward linkages of the university with the local economy and express knowledge-related impacts. These impacts extend over a greater time than the input effects and are thus long-run effects on local economic development (Felsenstein, 1996; 1568).

Within these forward linkages, the first output process to note is the role of the university in changing the local level of human capital. Universities not only produce highly skilled human capital, but employ highly skilled workers in a wide variety of disciplines as well. This high concentration of skills is likely to have several beneficial effects on the local economy. First, to the extent that a region is able to retain its graduates, a university will enhance the quality of the local workforce through the training of these graduates acquire. Second, the existence of a university can effect business location decisions. The existence of a university-generated, skilled labor pool can act as an incentive for firms to expand their activities in the area in order to take advantage of its highly skilled graduates and can also lead to an increase in local new firm formation. Third, a university's highly skilled staff may provide expert advice to local firms in a wide range of business-related activities, such as marketing, finance, and product development (Felsenstein, 1996; 1568; Armstrong and Taylor, 2000; 19).

The second process relates to the generation of knowledge. Universities add to the knowledge base of their local economy and increase the competitiveness of the local firms via university-business links, joint R&D, consultancy and contract research. Another area of university involvement is via resource utilization. The university may exploit human, financial and physical resources that are left underutilized in the economy (Felsenstein, 1996; 1570; Armstrong and Taylor, 2000; 19).

Finally, the local output effect of the university is reflected in enhancing local attractiveness. The university creates positive externality effects that enhance the economic as well as the social and cultural attractiveness of the area, thereby attracting firms, households, social and cultural events. Compared to expenditure effects, this kind of output effects are much harder to estimate and usually present a challenging area or university impact estimation (Felsenstein, 1996; 1570; Armstrong and Taylor, 2000; 19).

II. METHODOLOGICAL APPROACHES TO EXPENDITURE IMPACT ANALYSIS

In assessing the impact of a university on local income and employment, direct effects as well as indirect and induced effects should be discerned. The *direct effects* result from the expenditure made by the university for its operations and maintenance activities and from the spending of students and visitors. *Indirect effects* are the new economic activities that occur in order to meet the demand created by the presence of the university. The indirect effects are triggered by the direct expenditures of the university, students and visitors and benefits are reaped by other

sectors of the economy which are indirectly related to the university as a result of the subsequent economic activities. These effects are mainly the consequence of spin-offs in demands that follow from the initial direct spending, thereby generating more economic activities. *Induced effects* are the result of the university's spending on wages and salaries that induce spin-offs or a continuous chain of proportionate re-spending according to the marginal propensity to consume. This induced effect is also known as "Keynesian multiplier process". Once the university pays its employees, this constitutes the direct effect. These employees in turn spend a proportion of their salaries on local goods and services, thereby generating indirect effect. A proportion of these local sales are paid out as wages to local employees and profits to local business owners. A proportion of this income is in turn re-spent on local goods and services, thereby creating induced effects (Lantz *et al.*, 2002; 11).

Within university impact studies, two broad approaches that aim to estimate regional multipliers can be identified. These two approaches are the Keynesian income-expenditure approach which aims to estimate Keynesian-type income-expenditure multiplier and the input-output approach which aims to calculate sectoral output, income and employment multipliers.

A. The Keynesian Income-Expenditure Approach

A demand side approach to university impact analysis is based on the calculation of Keynesian-type income-expenditure multipliers. The basic concept of the Keynesian income and employment multiplier process is based on the assumption that expenditure by one person represents income for another person and that an increase (decrease) in income of one person results in an increase (decrease) in total income in the economic system (in this case the local economy) rising (falling) by some multiple of the initial income increase (decrease). The expansionary process operates only when there are some unemployed resources available within the economic system, otherwise the rise in demand would be met by rising prices and/or an increase in imports to the system. The size of the induced or multiplier effect depends on the extent to which income leaks from the system at each round of expenditure through direct and indirect taxation, saving and importation of goods and services, and the extent to which income gains (losses) replace (are compensated by) changes in transfer payments, such as unemployment or supplementary benefits (Lewis, 1988; 55).

We have:

$$\Delta Y = k(J \text{ or } W)$$

$$\Delta E = ke(J \text{ or } W)$$

where

ΔY = total change in income in the local economy.

ΔE = total change in employment in the local economy.

k = the Keynesian income multiplier.

J = the initial injection of income or jobs.

W = the initial withdrawal of income or jobs.

k_e = employment multiplier.

The full derivation of the multiplier is illustrated in the Appendix. The Keynesian income multiplier for GDP at factor prices applicable to an exogenous change in public expenditure, investment or exports is:

$$k = \frac{1}{1 - [c(1 - td - u)(1 - m)(1 - ti)]}$$

where;

c = the marginal propensity to increase (reduce) consumption from increases (reductions) in disposable income.

td = the marginal propensity to increase (reduce) direct taxation payments out of gross income gains (losses).

u = the marginal propensity to receive a decrease (increase) in transfer payments as a result of gross income gains (losses).

m = the marginal propensity to increase (reduce) expenditure on imports out of increases (decreases) in consumption.

ti = the marginal propensity to increase (reduce) indirect taxation (e.g. VAT) out of an increase (decrease) in consumption of locally consumed goods and services.

These parameters included in the income multiplier for the area being studied should be estimated in order to estimate the size of the multiplier and the induced effects of the university on the local economy (Lewis, 1988; 55-56).

B. The Input-Output Approach

An alternative approach to measuring the economic impact of a university is to construct input-output linkages between the university and the local economy. The input-output table is based on the equilibrium accounting notion that gross output of each sector is either sold to other sectors such as intermediate inputs, or it represents an element of final demand (e.g. investment, consumption or export) (Armstrong and Taylor, 2000; 36). The simple input-output model can be represented algebraically as (Rodriguez *et al.*, 1999; 5):

$$D_f = (I-A)X$$

where D_f is a column vector of total demand; I is the identity matrix; A is the direct or technical coefficient matrix and X is the column vector of total output. In consequence;

$$X = (I-A)^{-1}D_f$$

The equation allows establishing the production at each sector in order to fulfill the objectives of the final demand exogenously determined. The change in output is a

multiplicative function of the exogenous impulse in final demand (Rodriguez *et al.*, 1999, 5).

Input-output models are constructed primarily because they provide a detailed industry-by-industry breakdown of the predicted effects of changes in demand. Through input-output models sectoral output and employment multipliers can be estimated (Armstrong and Taylor, 2000; 43).

C. Weaknesses of Regional Multiplier Analysis

Despite the widespread use and popularity of regional multiplier analysis, this approach in measuring economic impacts has several major weaknesses. First, regional multiplier analysis does not take capacity constraints into account. If a regional economy has capacity constraints, producers may respond to an increase in demand by raising their prices rather than by increasing output. Thus, expenditure impact may have little or no effect on regional economy.

Next, regional multiplier analysis do not allow for interregional feedback effects. An increase in regional income causes an increase in imports, which are another region's exports. This would raise income in other regions, which in turn increase their own exports. However, such interregional feedback effects are not allowed for in regional multiplier analysis (Armstrong and Taylor, 2000; 20-21)..

Finally, regional multiplier analysis do not take negative externalities such as pollution or traffic congestion that result from the presence of the university into

account (Armstrong et al., 1994; 346). Despite these criticisms, regional multiplier analysis, which is used by many researchers, serves to be a useful tool in economic impact analysis.

III. LITERATURE REVIEW OF UNIVERSITY ECONOMIC IMPACT ANALYSIS

Many studies have aimed to estimate the spending impact of universities on the local economy. The majority of these studies incorporate a Keynesian multiplier analysis. Lewis (1988) assessed the direct, indirect and induced effects of the Polytechnic Wolverhampton in England, on the local economy in terms of income and employment generation using an input-output model. Lewis made several assumptions in order to arrive at some concrete conclusions. Job and income creation analysis incorporated both full time and part time jobs as well as jobs created by the student union. The estimation of indirect effects was based on the assumption that full time students from outside the area would attend courses in other localities if the particular university did not exist. Lewis specified the basic Keynesian income multiplier for GDP at factor prices applicable to an exogenous change in public expenditure, investment or exports as:

$$k = \frac{1}{1 - [c(1 - td - u)(1 - m)(1 - ti)]}$$

The full derivation of this Keynesian income multiplier is contained in the Appendix. Lewis estimated the parameter c , td , u and ti using national data. For the parameter m , based on Steele's (1971) study for an average English region, Lewis assumed a

higher value for an urban area. Based on these assumptions, Lewis estimated a multiplier of 1.027, which indicated that the induced effects of the university on the local economy are relatively small, as the multiplier is very close to one.

In calculating the real net effect of the student expenditure, Lewis assumed that those students whose home is not within traveling distance of the Polytechnic would take courses in other areas. He also assumed that 60 percent of student income is spent on local value added outputs. In summary, Lewis estimated the net benefit of the Polytechnic on the local economy as £21.3 million income generation and 2,096 job creation.

Bleaney *et al.* (1992) estimated gross output multiplier and disposable income multiplier for the University of Nottingham in England. The authors assumed that in the absence of the University, the same activities would have been dispersed to other universities in the UK. Moreover, they assumed that academic and academic-related staffs are part of a national labor market and in the absence of the University, they would have been employed at other universities outside the locality. To estimate the multipliers, the authors formed a model. The first round impact on gross output is:

$$Y_1 = L + A + hG$$

where Y_1 is gross output, L is labor services bought by the university, A is the additional labor income of university employees, G is goods and services bought from outside by the University and h is the proportion of G generated locally.

In order to calculate first round impact on disposable income, the authors applied an indirect tax rate, i , to the last term and subtracted immigrants' incomes, M . Then they applied the remainder a tax rate t , which reflected direct taxation. Thus, the equation for disposable income is:

$$D_1 = (1 - t) (Y_1 - M - hiG)$$

To calculate the second round increase in local gross output, they assumed that Z is the student expenditures, v is the proportion of student expenditures that is spent on gross output, w is the proportion of university employees' disposable income that is spent on local gross output and c is the proportion of disposable income that is consumed. Then the second round increase in local gross output at market prices is:

$$Y_2 = vZ + wcD_1 + wc(1 - t^*)M$$

The first term represents the local expenditure of students; the second is the additional local expenditures of residents whose incomes increase as a result of the University's presence; the third term reflects the additional local expenditure of immigrants, taxed at a rate t^* , which ignores the impact of benefits, since their incomes are assumed to be unchanged in quantity. Assuming that this second round would generate no immigration, the authors stated the impact on local residents' disposable incomes as:

$$D_2 = (1 - t) (1 - i)Y_2$$

Assuming once more a rate of local re-expenditure of w , a third round of expenditure is obtained as:

$$Y_3 = wcD_2 = wc(1 - t)(1 - i)Y_2$$

$$D_3 = (1 - t)(1 - i)Y_3 = wc(1 - t)(1 - i)D_2$$

The process was assumed to converge to final increments to gross output and disposable income of Y_f and D_f respectively. The gross output multiplier is then defined as:

$$Y_f / Y_1 = 1 + Y_2 / [1 - wc(1 - t)(1 - i)] Y_1$$

For residents' disposable income, the multiplier is:

$$D_f / D_1 = 1 + (1 - t)(1 - i)Y_2 / [1 - wc(1 - t)(1 - i)] D_1$$

The authors estimated the model using the University's financial data for the fiscal year 1988-89 and obtained a Keynesian multiplier for gross output as 1.259 and Keynesian multiplier for disposable income as 1.561. The results strongly suggest that the University has a non-marginal impact on its local economy.

Using the model built by Bleaney *et al.* (1992), Armstrong *et al.* (1994) estimated the local income multipliers for the fiscal year 1991-92. This study differs from the previous one as it examines the construction expenditures at the University separately from the annual operation expenditures. In data collection, contrary to the

previous studies which estimated the proportion of goods and services bought from outside by the University from a sample of invoices, Armstrong *et al.* (1994) surveyed all the invoices. Detailed surveys were also undertaken of the residential locations of all staff and students. The results of the study indicated that direct expenditures of the University amounted £67.93 million and direct employment was 1,863 jobs. Local gross output multiplier, local disposable income multiplier and local employment multiplier were estimated as 0.87, 0.439 and 1.098 respectively, which are indeed quite large for an economy as small and as open as Lancaster District.

Huggins and Cooke (1997) estimated local income and employment multipliers for Cardiff University for the fiscal year 1994-95, by extending the models used by Bleaney *et al.* (1992) for Nottingham University, and by Armstrong *et al.* (1994) for Lancaster University. In this study, gross local output and local disposable income multipliers were calculated for Cardiff and South East Wales (SE Wales) regions. To calculate the expenditures of the University on goods and services, a sample survey of invoices representing 25.9% of the total expenditure was undertaken without setting a lower cut-off point. In order to establish the economic impact of staff employment and spending, data on staff details were extracted from personnel database. To assess student expenditure, a questionnaire survey of 500 students was conducted. Huggins and Cooke ignored immigrants' incomes and calculated the full multiplier for gross local output and local disposable income via the mentioned method. Gross local output for Cardiff and SE Wales were estimated as £97 million and £102 million respectively while local disposable income for Cardiff and SE Wales were estimated as £52.7 million and £55 million respectively. The multiplier

for gross local output was estimated as 1.51 for Cardiff and 1.52 for SE Wales while the multiplier for local disposable income was estimated as 1.45 for Cardiff and 1.46 for SE Wales. The results indicate that the university has a non-marginal impact on both the economy of Cardiff and SE Wales.

Along with the traditional methodology, many studies use input-output modeling in estimating income and employment multipliers. Arik and Nsiah (2004) estimated the economic impact of Middle Tennessee State University on the economies of Nashville Metropolitan Statistical Area and Rutherford County for the fiscal year 2003. Four kinds of impacts, including the impact of university spending, the impact of payroll expenditures, visitors' spending and students' spending on the local economy were assessed using an input-output model and multipliers for the local economies were estimated. In this study, while estimating university employee spending, it was assumed that the university employees spend their incomes near where they live and data collection was based on the residential addresses of employees. In the estimation of student expenditures, it was assumed that if the university did not exist, students from within this area would continue their education at a college outside the metro area and all local students were treated as "net new" to the area. Data on student expenditures was taken directly from the Financial Aid Office records. The results indicated that the university was responsible for 9,176 jobs, \$680 million direct, indirect and induced business revenue and \$343 million in personal income.

Childs *et al.* (1999) studied the economic impact of the University's expenditures on the West Virginia economy for the fiscal year 1998. The impacts were estimated using the University's financial data and input-output modeling system. Economic impacts of output, employment, employee compensation and state taxes were estimated. For the fiscal year 1998, total economic impacts (direct, indirect and induced) of WVU included 17,728 job creation, \$947.5 million output generation, \$430 million employee compensation and \$26.5 million assorted state taxes.

Another study assessed the contribution of Arizona State University to the Arizona economy for the fiscal year 2002. The economic effects of the University are measured using two different approaches. By using the traditional approach, direct and indirect effects of ASU on jobs, earnings and spending in the Arizona economy are estimated using an input-output model. The total impact of ASU on spending in the state is estimated to be \$2.1 billion in the fiscal year 2002. The total employment impact was 37,020 jobs and the total earnings were estimated to be \$1,053 million.

In Turkey, only a few studies have been carried on to estimate the spending impacts of a university on its local area, however these studies are far from incorporating the induced effects as they did not include an estimation of a multiplier. Atik (1999) assessed the direct and indirect effects of Erciyes University on the local economy for the academic year 1997-98. Direct effects were estimated as 3.6 million YTL and 2,323 job creation. Indirect effects were estimated as 11.6 million YTL and 5,362 job creation.

Erkekoğlu (2000) estimated the direct and indirect effects of Sivas Cumhuriyet University on the local economy for the academic year 1998-99. Direct effects were estimated as 4.6 million YTL and 2,170 job creation while indirect effects were estimated as 10.8 million YTL and 2,794 job creation.

Another study was carried on by Tuğcu (2004) to estimate the direct and indirect effects of Nevşehir University on its local economy for the academic year 2002-2003. Direct effects were estimated as 1 million YTL and 101 job creation while indirect effects were estimated as 3.4 million YTL and 177 job creation

IV. KNOWLEDGE IMPACTS OF UNIVERSITIES ON THEIR LOCAL ECONOMIES

A. The Role of the Universities in Enhancing Local Human Capital

Providing formal education and training according to the requirements of business and industry is unquestionably the core mission of universities. Universities play a direct role in enhancing the local human capital base of the region in which they are located.

Investments in human capital yield returns at different levels. First, individuals earn a private rate of return, which results in greater earnings to the individual. Second, a social or general rate of return results in higher regional and national growth rates. Third, an organization specific rate of return results from the availability of a stock of

skilled labor that aligns with the current and emergent needs of the industry and communities (Geenhuizen, 2003; 2).

Thus, universities occupy a central position as providers of education in shaping the skills base of regional and local economies. They operate as attractors, educators and retainers of students, shaping them into knowledge-based graduates for firms in a region. Hence, contemporary universities are increasingly adapting a regionally-focused teaching which includes stronger focus on regional student recruitment, development of programs that address skills required by regional industries, particularly SMEs and the localization of learning processes through workplace-based learning and regional projects (Gunasekara, 2004; 330). Therefore, universities are and will continue to be the one of the most significant knowledge institutions of the regions in which they are located.

B. The Knowledge Generating Role of Universities and University-Business

Partnerships

One of the basic missions of the universities is to generate knowledge. As a part of the local innovative milieu and regional innovation networks, today the range of activities conducted by a university extends beyond education and research to include technology transfer, licensing, consultancy, encouraging spin-offs and commercial company formation. Starting from the beginning of the twentieth century and expanding in the 1980s, the university-business-government relations have taken on new forms, as universities have increasingly become a mechanism through which scientific knowledge and technology could be disseminated.

1. Reasons for University-Industry Cooperation

A number of reasons explain why universities and industry form cooperative relationships. From the universities' point of view, collaboration with industry provides funds and support for scientific development, collaboration for research, a space in the labor market for its graduates, prestige and legitimation (Morais and Bermudez, 2000, 3).

From the businesses' point of view, collaboration brings a number of advantages. Corporations can receive employee training at the university, may gain lead time by getting a head start at research, get the right of first refusal for an exclusive license, become identified as an industry leader, obtain easy and cheap access to certain complex technology, gain access to special university facilities that would be too expensive to obtain for the corporation, gain access to non-university personnel who bring skills and abilities not present on the faculty, obtain inexpensive physical space in university-business research parks for small entrepreneurial companies and obtain venture capital for many small entrepreneurial companies that some universities are willing to provide (Bowie, 1994;46).

From the government's point of view, university-business partnerships create and expand employment and flow of investments, thereby augmenting economic activity (Geiger, 1992; 283). These advantages have long stimulated partnership formation and collaboration between universities and industry. Moreover, governments are generally enthusiastic to support these linkages with the aim of fostering economic competitiveness and development.

2. Different Kinds of University-Industry Relations

Relations between university research and industry can be differentiated into two categories. The first relationship can be regarded as industry seeking *generic knowledge* from university research. Generic knowledge consists of scientific theory as well as the understanding of the physical equipment and processes required to put knowledge to work. The transmission of generic knowledge takes place most effectively through the interaction of individuals. Thus, the most fundamental form of university-industry interaction occurs through the use of *consultants*. Universities encourage consulting as it provides financial funds, keep faculty in applied fields and benefit student placement. Some universities designed university centers on campus to offer consulting services. Industry has also systematized consulting arrangements by creating *science advisory boards* which provide firms consulting on the latest technological developments (Geiger, 1992; 276).

A corporation generally funds university research in areas likely to produce generic knowledge needed for its own research and development efforts. The firm then can possess a comparative advantage and take the lead in new product formation. Thus, the basic form of industrial support for university research is *contract research*. In contract research often support is provided to faculty and graduate students and the critical factor is whether the research has value for the company's own R&D efforts (Geiger, 1992; 277).

Another kind of partnership can be done through the establishment of *research consortia*. Research consortia is an enlarged form of contract research that provide

more general kinds of support from several companies that support a particular vein of research at a single university. *Cooperative research centers* are more permanent institutions that distinguish from other university research centers with the existence of *industrial affiliate programs*. In cooperative research centers, sponsoring companies pay an annual fee to support the center and in return have privileged access to research results. Even in some industries such as pharmaceutical industry, large firms engage in multimillion-dollar long-term research contracts to have continuous access to generic academic research (Geiger, 1992; 277).

University research centers which are designed to attract industry support and focus on specific technologies are one of the most prominent forms of knowledge and technology transfer between universities and industry. Typically, university faculties participate voluntarily in these centers. The centers offer faculty opportunities to conduct research that they find congenial, access to sophisticated equipment, and supplemental income as well as opportunities for graduate students. They also have the potential to serve smaller firms that do not have large research facilities. In the United States, beginning from the late 1970s, National Science Foundation (NSF) encouraged one particular model of research center named “industry-university cooperative research centers” which were established from joint university-industry proposals. These centers were mainly based on researching communication technologies, computers and new materials. Beginning in 1985, NSF sponsored engineering research centers to strengthen research in engineering, to contribute to the improved competitiveness of American industry (Geiger, 1992; 278).

The second class of relationships is rather commercial which involves patents, real estate, nurturing and owning new businesses, technical assistance and occasionally product development. All these mechanisms stand one step away from the knowledge-generating activities of the university as they organizationally require special units that stand outside of the regular academic structure.

Establishing *internal offices for patenting* is one way of institutionalizing commercial activities for research universities. The function of these offices is to develop policies on intellectual property rights. These units ensure that the university learns and stakes its claims to all potentially valuable discoveries. This has created an environment in which universities have become more aggressive in identifying, securing and defending proprietary rights over patents, which rather shows a shift from their accustomed role of disseminating knowledge in a disinterested manner (Geiger, 1992; 280).

Perhaps one of the most popular forms of university-industry partnership is the establishment of *research parks* by universities. These production centers are sometimes named techno-park or science park as well. High-technology firms are attracted to university research parks because of the potential advantages of interacting closely with university scientists, having a ready supply of well trained personnel and obtaining access to university facilities and libraries. Indeed, universities are more than eager to establish research parks as the research park enhances the university research mission through consultation and research contracts with the technology firms. Besides, providing rental income from research parks is an attractive factor for universities.

The first such development, “Silicon Valley” was started by Stanford University in 1951. Silicon Valley is a 70 by 15 kilometers strip between San Francisco and San Jose, California. In the early 1980s, the area was identified as the nation’s ninth largest manufacturing center, with sales of more than \$40 billion annually and 40,000 new job creations. Silicon Valley has long served as a model for policymakers and planners who sought to replicate its success by building science parks, fund new enterprises and promote links between industry and firms (Castells and Hall, 1994; 12).

Saxenian (1994) discussed various reasons that explain why Silicon Valley could excel and successfully adapt to changing patterns of international competition. In her famous book *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*, Saxenian stated:

Silicon Valley has a regional network-based industrial system that promotes collective learning and flexible adjustment among specialist producers of a complex of related technologies. The region’s dense social networks and open labor markets encourage experimentation and entrepreneurship. Companies compete intensely while at the same time learning from one other about changing markets and technologies through informal communication and collaborative practices; and loosely linked team structures encourage horizontal communication among firm divisions and with outside suppliers and customers. The functional boundaries within firms are porous in a network system, as are the boundaries between firms themselves and

between firms and local institutions such as trade associations and universities (Saxenian, 1994; 2).

Saxenian demonstrated that informal networks between firms, individuals and local institutions including universities constituted the basis of the process of innovation in Silicon Valley. By the mid-1970s Silicon Valley had developed its social networks, its industrial basis, its supporting financial and service activities and its professional organizations that constituted an innovative milieu (Castells and Hall, 1994; 19).

Castells and Hall (1994) pointed out that the universities in the region (Stanford, Berkeley, San Jose State and Santa Clara) played a double role in the formation of innovative milieu. The universities, particularly Stanford, provided scientific-technological knowledge and they were the providers of highly-skilled labor before the milieu could generate its own labor market. Besides, universities in research parks play a central role for technology transfer between universities and small firms. However, each university should be considered as a unique source of innovation, meaning that a university may provide the basis of innovation in one region, but not in another. Universities usually act as good catalysts only when they are the right kind for their region.

3. The Paradigm of Entrepreneurial University

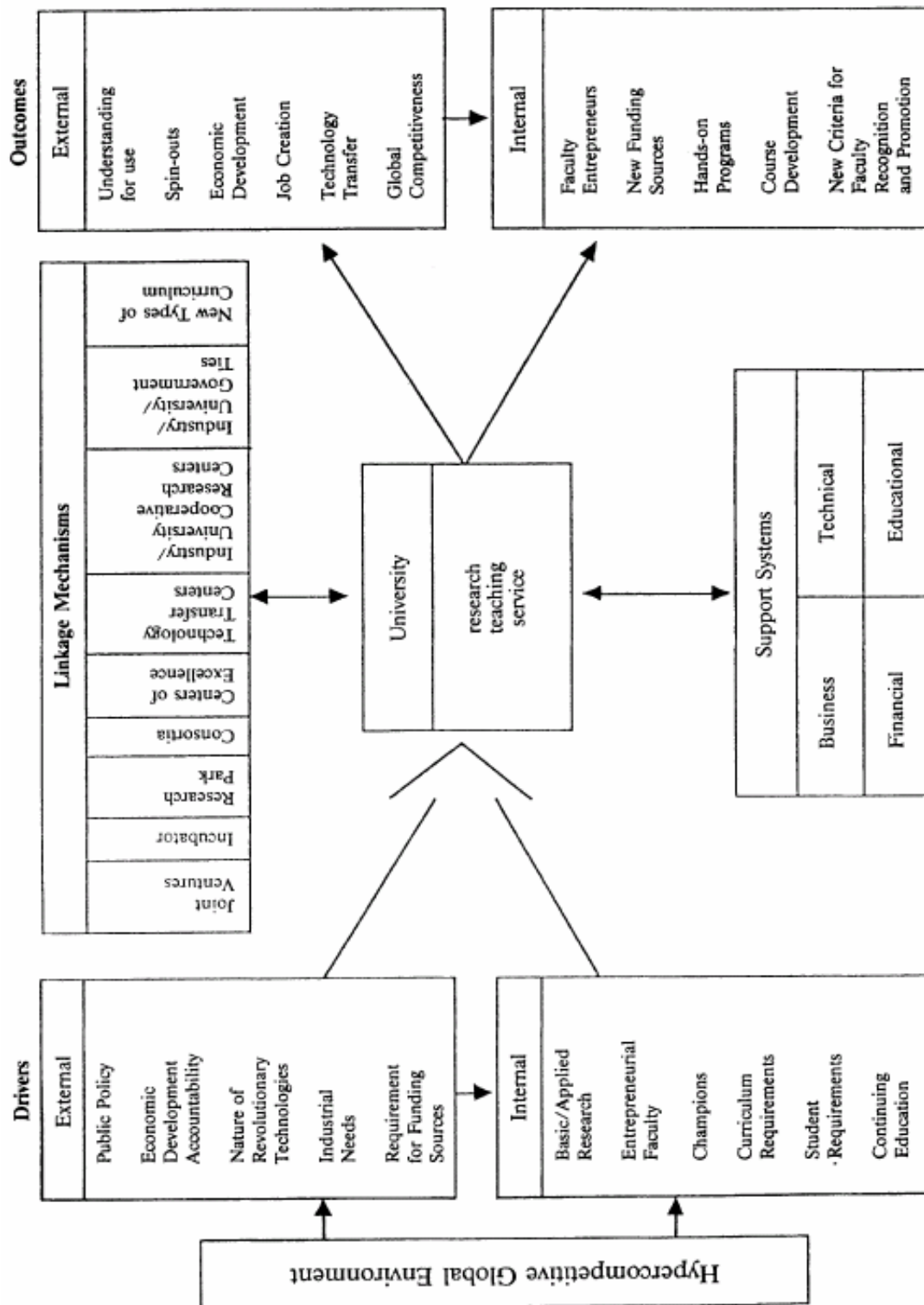
A more direct involvement of the university in the commercialization of research activities indulges a more proactive role on the universities in regional economic development. A new paradigm of “entrepreneurial university” has been emerging as

universities increasingly involve with encouraging, financing and owning new companies with their *business incubator programs*.

Smilor *et al.* (1993) has conceptualized the entrepreneurial US university paradigm. The paradigm shift to a more entrepreneurial university appears to be real not only in US universities, but in many of the European and developing world universities as well. The mechanisms for increasing technology transfer between universities and industry are illustrated in Figure 4.

The mechanisms between university and industry range from patenting to cooperative research centers, but perhaps the most striking mechanism is universities acting as incubators. Universities increasingly create a support system for faculty and students who want to establish companies, carry out applied research, develop intellectual property or in other ways participate in the commercialization of their creative products. The university support system for faculty investors and entrepreneurs usually involve a university administration that encourages faculty entrepreneurship and university policies that facilitate it; a research center which provides access to university facilities and services and acts as a conflict of interest buffer and a source of advice and encouragement; an innovation incubator, which is a physical facility where those in the process of business development can maintain an office and a prototype development area; a network of not-for-profit and for-profit advisory services and not-for-profit venture capital network (Morrison and Wetzel, 1991; 117-118).

FIGURE 4: The Paradigm of Entrepreneurial University



SOURCE: Huggins and Cooke, 1997; 326.

The policies summarized above serve to assist and encourage spin-off companies and foster growth of small firms. A *spin-off company* is a company that produces a product or service originating from research at a university. In many cases, the faculty member involved in the research would have started the company and may leave the university to run it, or an outside management team may be formed (Brett et al; 1991; 1). Spin-off companies provide many advantages to the region. Spin-off companies represent high technology and contribute to the modernization of the regional economy. Spin-off companies result in a more diversified and more stable economy, less sensitive to the failure of a single company or branch of industry. Spin-off companies are dynamic examples and attract new companies to the region. Spin-off companies subcontract production work and purchase specialized services, creating a production, service, building and transportation infrastructure. Spin-off company personnel also cause an expansion in public and private services, thus further expanding the regional economy (McQueen and Wallmark, 1991; 106-107). Thus university spin-off companies can be important catalysts for regional economic development.

Besides establishing business incubator programs, universities engage in entrepreneurial activities through *venture capital funds*. Universities that intend to provide venture capital to development stage companies and obtain equity in firms connected with the university's research center and incubator, generally establish separately incorporated subsidiaries (Geiger, 1992; 282).

Thus, contemporary entrepreneurial universities adapt a proactive approach to regional development as they increasingly involve in the commercialization of research activities, fostering spin-off companies and new firm formation. Universities are now paying increasing attention to the value of more applied research, innovative and relevant teaching and service to the local, regional and national public and private sectors. Thereby, universities are increasingly becoming important engines of economic growth and development.

CHAPTER 3

UNIVERSITIES AS CONTRIBUTORS OF REGIONAL ECONOMIC DEVELOPMENT: THE CASE OF IZMIR UNIVERSITY OF ECONOMICS

I. THE CONTEXT OF THE CASE STUDY

The case study illustrates some of the backward or expenditure linkages between Izmir University of Economics (IUE) and the metropolitan economy in the year 2004. The objective of this study is to assess the effect of the very presence of the University in the Izmir Metropolitan Area in terms of local income generation and employment creation.

Izmir University of Economics was established as a public corporation on April 14, 2001 by the Izmir Chamber of Commerce Education and Health Foundation with the initiative of Izmir Chamber of Commerce. IUE is located in Balçova municipal district within the city of Izmir. As of June 2005, IUE has 5 faculties and 16 departments, 2 vocational schools and 1 graduate school.

In this study, the Izmir Metropolitan Area is defined as the municipal districts of Konak, Bornova, Balçova, Karşıyaka, Çiğli, Narlıdere, Güzelbahce, Urla, Gaziemir, Kemalpaşa, Aliağa, Foça, Menemen, Torbalı, Bayındır, Selçuk, Seferihisar and Menderes. Almost all full-time faculty and staff reside in the Izmir Metropolitan Area. Annual net payroll for these employees in the year 2004 is approximately 4.3 million YTL. On the assumption that most expenditure is at place of residence, a

considerable direct income injection to the metropolitan economy becomes apparent. Another economic development linkage is through purchasing. University direct expenditure in the metropolitan area is estimated as 13 million YTL out of annual gross purchasing expenditure of 14.5 million YTL. In addition to generating direct income injection to the economy, the University provides direct employment creation through its full-time academic staff, part-time academic staff and administrative staff. In the academic year 2003-2004 Spring semester, the University employed 142 full-time academic staff, 177 part-time academic staff and 53 administrative staff. In the academic year 2004-2005 Fall semester, the University employed 198 full-time, 180 part-time academic staff and 66 administrative staff.

The University enrolls a significant number of students whose expenditure makes a prominent contribution to the service sector in Izmir. In the year 2004, the undergraduate students resided in Izmir for a minimum of 30 weeks. The number of students enrolled in the University is presented in Table 3.

TABLE 3: Number of students enrolled in Izmir University of Economics

	Undergraduates	Vocational School	Graduates
2003-2004 academic year Fall semester	1,305	1,027	149
2003-2004 academic year Spring semester	1,293	997	179
2004 Summer School	313	181	-
2004-2005 academic year Fall semester	2,313	983	211
2004-2005 academic year Spring semester	2,309	965	232

SOURCE: The records of the Registrar's Office.

In 2003-2004 academic year Fall semester, 1,305 undergraduate, 1,027 vocational school and 149 graduate students were enrolled in the University. In 2003-2004 academic year Spring semester, 1,293 undergraduate, 997 vocational school and 179 graduate school were enrolled. In the 2004 Summer School, 313 undergraduate, 181 vocational school and 145 English Preparatory Program students were enrolled. In 2004-2005 academic year Fall semester, 2,313 undergraduate, 983 vocational school and 211 graduate students were enrolled. Finally, in the academic year 2004-2005 Spring semester, 2,309 undergraduate, 965 vocational school and 232 graduate students were enrolled in IUE.

II. METHODOLOGY AND DATA

The analysis of expenditure linkages of the University with Izmir Metropolitan Area is undertaken using the model developed by Huggins and Cooke (1997) to measure the economic impact of the Cardiff University on the local economy, which is indeed a development of the model used by Bleaney *et al.* (1992) for Nottingham University and Armstrong *et al.* (1994) for Lancaster University.

It should be noted from the beginning that practical studies have to rely heavily on “guesstimates” or assumptions which will remain open to question or contradiction. Economic impact analyses are practical applications and in order to arrive at some concrete conclusions, a number of such assumptions have been made. These assumptions are made clear at all times throughout this study.

The analysis in this study is confined to a single base year, 2004 and reflects the latest University accounting data. However, it is important to note that while the analysis is based on data for a single year, the full impact of any expenditure injection is likely to occur over a number of years.

In an economic impact study, definition of income is an issue of importance. If income is defined as Gross Local Output (Y), then the total value of additional educational and other services accruing to the Izmir Metropolitan Area as a consequence of the University's presence has to be counted. Thus, one would be measuring the University's impact on the gross output of the area. Although this would be a good measure for assessing the weight which the University adds to the local economy, a large slice of this money has no local effects, as it simply flows back to the government in the form of income tax and national insurance contributions. Therefore, one may also include the impact on total disposable income, which would equal additional gross output, less additional taxes, plus additional subsidies and transfer payments (Bleaney *et al.*, 1992; 307).

Given this background, this study presents estimated answers for the following questions.

1. What is the impact of Izmir University of Economics on the gross output of the area?
2. What is the impact of the University on the disposable incomes of the inhabitants of the area, who would have been there anyway?

Therefore, separate estimates are calculated for gross local output (Y) and local disposable income (D).

Table 4 sets out the main components of expenditure associated with the annual operation of the University in the fiscal year (FY) 2004. In FY 2004, the University paid a total of 5 million YTL wages to full-time academic staff, part-time academic staff and administrative staff. The values show the net payments and do not include the payments made to part-time academic staff, who resides outside of Izmir Metropolitan Area and tax payments to government.

In FY 2004, the University purchased goods and services to the value of 14.6 million YTL from 261 suppliers in Izmir and 45 suppliers from elsewhere. In order to assess the extent of purchasing in Izmir and elsewhere, all of the invoices were examined to determine the value of goods and services and the location of the supplier. The results revealed that approximately 87% of goods and services were purchased in Izmir Metropolitan Area and 13% elsewhere. The result of the study indicated that there is a considerable large number of suppliers in Izmir, who were benefiting from University business.

TABLE 4: Direct Expenditure by Izmir University of Economics in FY 2004.

	YTL000s
University staff salaries and wages	
Full-time academic and administrative staff	4.252
Part-time academic and administrative staff	759
<i>Total salaries and wages</i>	5.011
Non-wage expenditures	
Conferences, seminars, panels symposiums	70
Photocopy, stationery goods, publications	150
Food, catering	50
Clothes	1
Health	4
Internet	5
University promotion	218
Sports events	116
Rent, heat, light, water and power	1.087
Transportation and insurance	112
Repairs and general maintenance	102
Financial expenses	384
Consultancy	180
Auditor's remuneration	25
Transportation allowance	45
Security	80
Office fixtures and equipment	1.544
Laboratory, TV and studio fixtures	94
Computer programs fixtures	235
Vehicle purchases	175
Library fixtures	12
Building and land purchases	8.406
Other education, management, operation and fixtures related expenses	1.471
<i>Total non-wage expenditure</i>	14.565
Depreciation	628
Total expenditure by Izmir University of Economics	20.204

Source: Taken from the Financial Statements of the University for FY 2004

In order to establish the economic impact of staff employment and spending in Izmir Metropolitan Area, staff details on residence were extracted from personnel database. Analysis revealed that 99% of all University staff resides within Izmir Metropolitan Area. To calculate the proportion of university staff expenditure that is spent in Izmir, a sample survey of 80 academic and administrative staff is undertaken. The composition of the sample survey was as follows: 25% full-time Turkish academic staff, 20% foreign academic staff, 20% Turkish instructors from School of Foreign Languages, 15% part-time Turkish instructors, 10% research assistants and instructors and 10% administrative staff. The results of the survey indicated that 95% staff expenditure took place inside of Izmir Metropolitan Area and only 5% is spent outside of Izmir Metropolitan Area. The surveys used in this study are included in the Appendix.

In order to assess student expenditure in Izmir, a questionnaire survey of 200 students were undertaken. The surveys used in this study are also included in the Appendix. The survey yielded that the average total weekly expenditure of students in the year 2004 was 877 YTL per student and that only 92% of this took place outside of Izmir Metropolitan Area. In this study, all the full-time students are considered as net new as it is assumed that they would be attending private universities in other cities if Izmir University of Economics had not existed. Total student expenditure in the year 2004 was calculated by multiplying the average weekly expenditure per student by the number of students and number of weeks in each academic semester. In the calculations, the highest five and the lowest five values are not included

Initial Injection (Expenditure Base)

The model involves a number of stages. At the outset, the model simply involves estimating the size of the initial monetary injection into the local economy.

This expenditure base is given as:

$$E = L + G \quad (1)$$

where E = expenditure base, L = labor services bought by the University, G = goods and services bought from outside by the University. E excludes depreciation and pensions. L is the net payments and does not include the payments made to part-time academic staff, who resides outside of Izmir Metropolitan Area and tax payments to government.

First-round Gross Local Output (GLO)

$$Y_1 = L + A + hG \text{ measured at market prices} \quad (2)$$

where Y_1 = first-round GLO, and h = the proportion of G generated locally, A = the additional labor incomes of University employees.

First-round Local Disposable Income

This given as:

$$D_1 = (1 - t) (Y_1 - hiG)$$

where D_1 = first round impact on disposable incomes of local residents, i = indirect tax rate (e.g. VAT), t = a direct tax rate.

Second-round Gross Local Output (GLO)

This is given as:

$$Y_2 = vZ + wcD_1$$

where Z = total spending by students, v = proportion of student expenditures made on locally produced goods and services, w = proportion of staff spending on locally produced goods and services, c = proportion of additional staff income consumed (the remainder is being saved) – the marginal propensity to consume.

Second-round Disposable Income

This is given as:

$$D_2 = (1 - t)(1 - i)Y_2$$

Assuming once more a rate of local re-expenditure of w , a third round of expenditure is obtained

$$Y_3 = wcD_2 = wc(1 - t)(1 - i)Y_2$$

$$D_3 = (1 - t)(1 - i)Y_3 = wc(1 - t)(1 - i)D_2$$

The Full Multiplier for Gross Local Output (all rounds)

The process is assumed to converge to final increments to gross output and disposable income of Y_f and D_f respectively. The gross output multiplier is then defined as

$$\begin{aligned} Y_f / Y_1 &= (Y_1 + Y_2 + Y_3 + \dots) / Y_1 \\ &= 1 + (1 + wc(1-t)(1-i) + \dots) Y_2 / Y_1 \\ &= 1 + Y_2 / [1 - wc(1-t)(1-i)] Y_1 \end{aligned}$$

Y_f = the final GLO (after all rounds of the multiplier process).

The Full Multiplier for Local Disposable Income (all rounds)

This is given as:

$$\begin{aligned} D_f / D_1 &= (D_1 + D_2 + D_3 + \dots) / D_1 \\ &= 1 + (1-t)(1-i)(1 + wc(1-t)(1-i) + \dots) Y_2 / D_1 \\ &= 1 + (1-t)(1-i)Y_2 / [1 - wc(1-t)(1-i)] D_1 \end{aligned}$$

D_f = the final disposable income (after all rounds of the multiplier process).

These are multipliers in the normal Keynesian sense, calculated as the ratio of the final to the first-round increment to income.

III. ESTIMATING THE MODEL

The estimation of the model consists of using the multiplicand coefficients and variables generated from other sources as listed. All data refers to YTL000s.

Initial Injection

$$E = L + G$$

L = total labor costs

$$L = 5,011$$

G = expenditure on goods and services - depreciation

$$G = 14,565$$

$$E = 5,011 + 14,565 = 19,576$$

(1a) *First-round Gross Local Output (GLO)*

$$Y_1 = L + hG \text{ measured at market prices}$$

h = the proportion of G generated locally = $(13,143/15,193) = 0.87$ for Izmir

Metropolitan Area.

$$Y_1 = (5,011) + (0.87)(14,565) = 17,683$$

(1b) *First-round Local Disposable Income*

$$D_1 = (1 - t) (Y_1 - hiG)$$

t = a direct tax rate = 0.3 (taken from University internal financial data), i = indirect tax rate = 0.15. i is calculated by using a sample sub-survey from the student

expenditure survey. A sample of 7 surveys is taken in the expenditure range of 0-500 YTL, 14 in the range of 500-1000 YTL, 6 in the range of 1000-1500 YTL, 2 in the range of 1500-2000 YTL and 1 in the range of 2000+ YTL, which in total consists of 30 surveys. The result of the sub-sample survey indicated that 70% of the student expenditures are for the goods and services that are subject to 18% VAT and 30% of the expenditures are subject to 8% VAT. Thereby, i is calculated as a weighted average of the indirect tax rates. $i = (0.7)(0.18) + (0.3)(0.08) = 0.15$

Therefore:

$$D_1 = (1 - 0.3)(17,683 - (0.87)(0.15)(14,565)) = 11,047 \text{ for Izmir}$$

Metropolitan Area.

(2a) Second-round Gross Local Output

$$Y_2 = vZ + wcD_1$$

Z = total spending by students. Weekly student spending = 220 YTL per student. Table 3 shows the number of students enrolled in IUE during the year 2004. There were 1305 undergraduates and 1027 vocational school students enrolled in the 2003-2004 academic year Fall semester, 1293 undergraduates and 997 vocational school students in 2003-2004 academic year Spring Semester, 2313 undergraduates and 983 vocational school students in the 2004-2005 academic year Fall semester. For the purposes of this study graduate students are excluded as it is assumed that most are from locality and would already be in residence. Moreover, Summer School enrollment has been excluded for the purposes of using the most conservative measures as it is assumed that students attending the Summer School may leave the

Metropolitan Area and spend their money in recreational areas after attending the classes. 4 weeks from the 2003-2004 academic year Fall semester, 15 weeks from the 2003-2004 academic year Spring semester and 13 weeks from the 2004-2005 academic year Fall semester, for a total of 32 weeks are included in the calculation. Therefore $Z = [(220)(4)(2,332) + (220)(15)(2,290) + (220)(13)(3,296)] = 19,035,720$ YTL (approx.)

v = proportion of student expenditures on goods and services in the locality. From the sample survey, it is estimated that only 92% student expenditures took place outside of Izmir Metropolitan Area. Students' spending in the University is not deducted from the student expenditures since the University buys the catering and stationery services from outside. Therefore, student expenditures within the University do not cause the incidence of double counting.

w = proportion of staff spending on locally produced goods and services. w is calculated as 0.95 from the university staff survey.

c = the marginal propensity to consume = from the data obtained from The Central Bank of Turkey statistical database, this is estimated to be 0.64. Tugcu (2004) estimated the parameter c as 0.67 in calculating the indirect spending impacts of Nevsehir University on the local economy. Thereby, it is reasonable to conclude that the value of 0.64 for the parameter c is consistent with the previous studies. Moreover, it is assumed that marginal propensity to consume calculated by using Turkish national data is also valid for Izmir Metropolitan Area. The results of the regression analysis for calculating the parameter c is illustrated in the Appendix.

Therefore:

$$Y_2 = (0.92)(19,036) + (0.95)(0.64)(11,342) = 24,230$$

(2b) *Second-round Disposable Income*

$$D_2 = (1 - t)(1 - i)Y_2$$

$$D_2 = (1 - 0.3)(1 - 0.15)(24,409) = 14,417$$

(3a) *Third-round Gross Local Output*

$$Y_3 = wcD_2$$

$$Y_3 = (0.95)(0.64)(14,417) = 8,766$$

(3b) *Third-round Disposable Income*

$$D_3 = (1 - t)(1 - i)Y_3$$

$$D_3 = (1 - 0.3)(1 - 0.15)(8,766) = 5,216$$

(4a) *Fourth-round Gross Local Output*

$$Y_4 = wcD_3$$

$$Y_4 = (0.95)(0.64)(5,216) = 3,171$$

(4b) *Fourth-round Disposable Income*

$$D_4 = (1 - t)(1 - i)Y_4$$

$$D_4 = (1 - 0.3)(1 - 0.15)(3,171) = 1,887$$

(5a) *Fifth-round Gross Local Output*

$$Y_5 = wcD_4$$

$$Y_5 = (0.95)(0.64)(1,887) = 1,147$$

(5b) *Fifth-round Disposable Income*

$$D_5 = (1 - t)(1 - i)Y_5$$

$$D_5 = (1 - 0.3)(1 - 0.15)(1,147) = 682$$

(6a) *Sixth-round Gross Local Output*

$$Y_6 = wcD_5$$

$$Y_6 = (0.95)(0.64)(682) = 415$$

(6b) *Sixth-round Disposable Income*

$$D_6 = (1 - t)(1 - i)Y_6$$

$$D_6 = (1 - 0.3)(1 - 0.15)(415) = 247$$

(7a) *Seventh-round Gross Local Output*

$$Y_7 = wcD_6$$

$$Y_7 = (0.95)(0.64)(247) = 150$$

(7b) *Seventh-round Disposable Income*

$$D_7 = (1 - t)(1 - i)Y_7$$

$$D_7 = (1 - 0.3)(1 - 0.15)(150) = 89$$

(8a) *Eighth-round Gross Local Output*

$$Y_8 = wcD_7$$

$$Y_8 = (0.95)(0.64)(89) = 54$$

(8b) *Eighth-round Disposable Income*

$$D_8 = (1 - t)(1 - i)Y_8$$

$$D_8 = (1 - 0.3)(1 - 0.15)(54) = 32$$

(9a) *Ninth-round Gross Local Output*

$$Y_9 = wcD_8$$

$$Y_9 = (0.95)(0.64)(32) = 19$$

(9b) *Ninth-round Disposable Income*

$$D_9 = (1 - t)(1 - i)Y_9$$

$$D_9 = (1 - 0.3)(1 - 0.15)(19) = 11$$

(10a) *Tenth-round Gross Local Output*

$$Y_{10} = wcD_9$$

$$Y_{10} = (0.95)(0.64)(11) = 7$$

(10b) *Tenth-round Disposable Income*

$$D_{10} = (1 - t)(1 - i)Y_{10}$$

$$D_{10} = (1 - 0.3)(1 - 0.15)(7) = 4$$

(11a) *Eleventh-round Gross Local Output*

$$Y_{11} = wcD_{10}$$

$$Y_{11} = (0.95)(0.64)(4) = 2$$

(11b) *Eleventh-round Disposable Income*

$$D_{11} = (1 - t)(1 - i)Y_{11}$$

$$D_{11} = (1 - 0.3)(1 - 0.15)(2) = 1$$

(12a) *Twelfth-round Gross Local Output*

$$Y_{12} = w c D_{11}$$

$$Y_{12} = (0.95)(0.64)(1) = 1$$

(12b) *Twelfth-round Disposable Income*

$$D_{12} = (1 - t)(1 - i)Y_{12}$$

$$D_{12} = (1 - 0.3)(1 - 0.15)(1) = 1$$

Total Gross Local Output FY 2004

Total Gross Local Output (GLO) is equal to the sum of the outputs for each round of spending and is shown by Table 5.

TABLE 5: Estimated gross local output for Izmir Metropolitan area for the fiscal year 2004 (YTL 000)

	Izmir Metropolitan Area
Round 1	17,683
Round 2	24,230
Round 3	8,766
Round 4	3,171
Round 5	1,147
Round 6	415
Round 7	150
Round 8	54
Round 9	19
Round 10	7
Round 11	2
Round 12	1
Total	55,645

Therefore, Izmir University of Economics has the effect of generating a gross local output in Izmir Metropolitan Area of 55.65 million YTL.

Total Local Disposable Income FY 2004

Total Local Disposable Income (LDI) is to equal to the sum of the incomes for each round of spending, and is shown by Table 6.

TABLE 6: Estimated local disposable income for Izmir Metropolitan Area for the fiscal year 2004 (YTL 000)

	Izmir Metropolitan Area
Round 1	11,047
Round 2	14,417
Round 3	5,216
Round 4	1,887
Round 5	682
Round 6	247
Round 7	89
Round 8	32
Round 9	11
Round 10	4
Round 11	1
Round 12	1
Total	33,634

Therefore Izmir University of Economics has the effect of generating local disposable income in Izmir Metropolitan area of 33.63 million YTL .

Full Multiplier for GLO

This is given as:

$$\begin{aligned} Y_f / Y_1 &= 1 + Y_2 / [1 - wc(1 - t)(1 - i)] Y_1 \\ &= 1 + 24,230 / [1 - (0.95)(0.64)(1 - 0.3)(1 - 0.15)]17,683 \\ &= 3.14 \end{aligned}$$

where all terms are as previously defined, and Y_f = the final GLO (after all rounds of the multiplier process).

The GLO multiplier of 3.14 means that 1YTL of initial increase (decrease) in the value of Y_1 (labor costs plus University's expenditure in Izmir Metropolitan Area) gives rise (fall) to 3.14TL in gross local output.

The Full Multiplier for LDI

This is given as:

$$\begin{aligned} D_f / D_1 &= 1 + \frac{(1 - t)(1 - i)Y_2}{[1 - wc(1 - t)(1 - i)](D_1)} \\ &= 1 + (1 - 0.3)(1 - 0.15)(24,230) / [1 - (0.95)(0.64)(1 - 0.3)(1 - 0.15)](11,047) \\ &= 2.99 \end{aligned}$$

where all terms are as previously defined, and D_f = the final LDI (after all rounds of the multiplier process).

The LDI multiplier of 2.99 means that 1YTL of initial increase (decrease) in the value of D_1 (first round impact on disposable incomes of local residents) gives rise (fall) to 2.99TL in local disposable income.

Expenditure Base Multipliers

Expenditure base multipliers can also be calculated for the University, which are the ratios Y_f / E and D_f / E .

Local Gross Output Expenditure Base Multiplier

This is given as:

$$Y_f / E = 55,645 / 19,576 = 2.84$$

Local Disposable Income Expenditure Base Multiplier

This is given as:

$$D_f / E = 33,634 / 19,576 = 1.72$$

When expressed as expenditure base multipliers, 1YTL of initial University expenditure gives rise (fall) to 2.84YTL in local gross output and 1.72 YTL in local disposable income.

Basic Keynesian Multiplier

This is given as:

$$k = 1 / [1 - wc(1 - t)(1 - i)]$$

$$k = 1 / (1 - (0.95)(0.64)(1 - 0.3)(1 - 0.15)]$$

$$k = 1.56$$

The basic Keynesian multiplier of 1.56, implies that for every 1YTL gained (lost) to the local economy, a further gross income expansions (reductions) of 1.56YTL

income will be gained (lost) through increases (falls) in expenditure on locally produced goods and services.

Table 7 summarizes the main financial effects of the operation of Izmir University of Economics in Izmir Metropolitan Area.

TABLE 7: The Effect of the Operation of Izmir University of Economics in Izmir Metropolitan Area.

	Izmir Metropolitan Area
Expenditure base	19,576
First-round GLO (Y_1)	17,683
First-round LDI (D_1)	11,047
Second round GLO (Y_2)	24,230
Second round LDI (D_2)	14,417
Final GLO (Y_f)	55,645
Final LDI (D_f)	33,634
GLO multiplier	3.14
LDI multiplier	2.99
Expenditure base multiplier (GLO) (Y_f/E)	2.84
Expenditure base multiplier (LDI) (D_f/E)	1.72
Basic Keynesian Multiplier	1.56

Both the GLO multiplier and LDI multiplier are greater than the basic multiplier as expected since the University attracts additional expenditures particularly from students. Table 8 illustrates the multipliers estimated by Lewis (1988) for for Wolverhampton Polytechnic, Bleaney et al. (1992) for Nottingham Univesity, Armstrong et al. (1994) for Lancaster University and Huggins and Cooke et al. (1997) for Cardiff University. The basic multiplier estimated for Izmir University of Economics is greater than the basic multipliers calculated by Lewis (1988) and Bleaney *et al.* (1992) and Huggins and Cooke (1997).

TABLE 8: Estimated Multipliers from Previous Studies

	Basic multiplier	GLO multiplier	LDI multiplier	GLO expenditure base multiplier	LDI expenditure base multiplier
Lewis (1988)	1.027	-	-	-	-
Bleaney et al. (1992)	1.059	1.259	1.561	1.021	0.162
Armstrong et al. (1994)	-	-	-	0.87	0.439
Huggins and Cooke (1997)	1.15	1.51	1.45	1.13	0.61

SOURCE: Lewis (1988), Bleaney *et al.* (1992), Armstrong *et al.* (1994), Huggins and Cooke *et al.* (1997).

There are some differences in the tax rates marginal propensity to consume and proportion of University services sourced locally in three four studies. However, the principal difference results from the assumed values of v and w . Lewis sets these both at 0.1, Bleaney *et al.* sets them at 0.43 and 0.22 and Huggins and Cooke assign them 0.58 and 0.28 respectively. Compared to these low values of v and w in the previous studies, in this case study these values have been assigned very high values, 0.92 and 0.95 respectively. This fact is mainly due to the definition of the geographical study area in this case study. As Beck *et al.* (1995) emphasize, broader the geographical area in the economic impact study, the greater will be the proportion of university vendor contracts and employees' and students' expenditures included in the direct economic impact and the higher will be the estimated multiplier (Beck et al., 1995; 249). Therefore, the multiplier values estimated in this study for the Izmir Metropolitan Area are reasonable when the broadness of the geographic area is considered. However, if the area included in this study had been

restricted to Balçova district only, rather than the Izmir Metropolitan Area, then the estimated multipliers would have been lower.

IV. KNOWLEDGE IMPACTS OF IZMİR UNIVERSITY OF ECONOMICS ON THE LOCAL ECONOMY

A. THE ROLE OF IZMİR UNIVERSITY OF ECONOMICS AS AN ENTREPRENEURIAL UNIVERSITY

In line with the new paradigm of entrepreneurial university, Izmir University of Economics has established an incubator named Embryonix, which is a support system for students who want to establish companies. Embryonix project aims to support local development by encouraging entrepreneurial and innovative ideas among university students and providing start-up resources for new firm formation.

Embryonix functions in two main areas. These are Student-Run Businesses (SRBs) and Innovative Businesses (IBs). Student-Run Businesses are small firms, which are set-up by IEU students to produce goods and services within the campus. The main purpose of SRBs is to develop and improve students' managerial capabilities, skills and knowledge while introducing them the real business life. SRBs are established by at least three students and when students graduate or leave work for any reason, other students can apply for SRBs. IBs are small firms founded on an innovative idea, that produce goods and services by IEU students and/or entrepreneurs from outside the University. The main purpose of IBs is to create a support system for innovative entrepreneurs and through this contribute to local economic development.

Contrary to SRBs, IBs can stay in the incubator only for two years. Within two years, they are expected to mature and continue their operations as a spin-off company.

Embryonix was founded on June 2004 as a limited company and functions as a sub-unit of The Office of Dean of Students. This unit has the responsibility of selecting the projects which are to be included in the Embryonix project, allocating resources efficiently, observing their operations, consulting, supervising and distributing the income generated to involved parties. Embryonix has been formed by the partnership of IUE with a share of 80% and Izmir Chamber of Commerce, Aegean Region Chamber of Commerce, Association of Aegean Region Industrialists and Businessman and Association of Aegean Region Young Industrialists each with a share of 5%. Each project in Embryonix is assessed as a separate project under this limited company.

Students and entrepreneurs who wish to work in Embryonix project present their business plans to Embryonix. These plans are examined by related boards and those students whose plans are accepted can start operation. Throughout their operation, IUE provides space, internet and telephone services, basic office equipment, start-up resources, meeting room and conference hall for special occasions and consultancy on financial, legal and operational issues.

As of June 2005, two start-up firms have been operating under the Embryonix project. One is a SRB, named TRIO Copy Center, which is the University's copy center and the other is an IB, named POTLACH Production, which is an innovative design company. TRIO Copy Center was founded by the partnership of three

undergraduate students; one third year student from the Department of Mathematics and two fourth year students from the Department of Economics. TRIO Copy Center started its operations on October 2004 and currently employs two workers and a part-time student. The student partners receive a minimum wage and have an insurance plus dividend income in every three months.

POTLACH Production was founded on January 2005 by three undergraduate students; one third year student from Izmir University of Economics, Department of Fashion Management, one third year student from Dokuz Eylul University, Department of Cinema, Television and Directory and one from Dokuz Eylul University, Department of Photography. POTLACH Production currently employs 17 part-time employees in total, of which 7 works in the office located in the Embryonix. POTLACH Production has five main operation areas. These are graphical design, photography in fashion and advertisement, video, introductory films and advertisement film production, webpage design and construction and design of stands used in fairs. Although the company has been working for only six months, it has achieved quite an impressive work. The works done by POTLACH Company includes designing the promotion products and web page of Efe Rakı, designing labels and etiquette for Özsu, Frida, Eges and Real Tone, designing a new image and web page for Özsu, designing web page and product catalogue for Karat which is a company that sells gold, silver and gift, designing posters for IUE, designing a web page and visually printed materials for Soundworks, designing web pages and photographing product catalogs for Verdi Gıda and Karçe Gıda, designing a web page and shooting an introductory film which will be broadcasted abroad for Company ADD, making an introductory film for Egemen Menkul Kıymetler and

designing a web page and visually printed materials for GNS Mimarlık, which is their only customer located outside of Izmir. POTLACH Production has an organization structure in which at least one person is responsible from graphics design, marketing, video production, web design and photography. The employees of POTLACH Company receive hourly wage rate per project. At the end of the year, Embryonix will take 25% of the profit and the rest will be distributed among the employees.

Embryonix project provides a number of benefits both for the students and for the local economy. Embryonix enables students to experience real business life when they are still students. By utilizing the knowledge and experience they gain from Embryonix project, students may successfully set-up and manage their own companies or be employed at a well-known corporation. Embryonix provides a support system for students who have innovative ideas, thereby contributing to the local and national economy. Moreover, successful and unsuccessful projects that are observed and assessed at a laboratory environment will also contribute to the academic achievements of Izmir University of Economics and act as a catalyst in future academic research.

These distinguished opportunities IUE provides to its students are expected to serve as a role model for other universities in encouraging entrepreneurship and regional development. In the long run, universities' encouragement of entrepreneurship through incubation process can result with significant income generation and employment creation for Turkey, and combined with synergistic process of networking, local and national development can gain pace.

B. IZMIR UNIVERSITY OF ECONOMICS AS A KNOWLEDGE NODE IN REGIONAL NETWORKS

In order to support research activities, Izmir University of Economics has founded three research centers. These are “Center for Continuous Education”, “Research Center for Izmir Congress of Economics” and “Center for European Union Research and Applications”.

With the objective of enhancing regional economic development, Izmir University of Economics has built networks with Izmir Chamber of Commerce and Salihli Chamber of Commerce and conducted several research projects. These research projects are listed in Table 9.

The project of “Formation of the General Profile of Salihli and Announcement to the Public” started on March 2004 and completed on June 2005 by the Department of International Trade and Finance. The project mainly involved assessing the economic structure of Salihli, analyzing associated problems, providing remedial solutions and guiding the public and in particular businessman and governors about how to utilize regional potentials in the future.

TABLE 9: Research Projects Carried on by the Faculty

Projects	Departments	Sponsor Institute	Project Status
Formation of the General Profile of Salihli and Announcement to the Public	Department of International Trade and Finance	Salihli Chamber of Commerce	Completed
Determining the Problems Associated with New Turkish Lira and Proposing Remedial Solutions	Department of Management	Izmir Chamber of Commerce	Completed
Assessing the Public View of Tourism	Department of Management	Izmir Chamber of Commerce	Completed
Urban Tourism and Developing Tourism in Izmir	Department of Management	Izmir Chamber of Commerce	Continues
Improving and Renewing Wholesale and Consumer Price Indices	Department of Economics	Izmir Chamber of Commerce	Continues

SOURCE: Auditor’s Supervision and Assessment Report for the year 2004.

The other project named “Determining the Problems Associated with New Turkish Lira and Proposing Remedial Solutions” started on October 2004 and completed on November 2004 by the Department of Management. This project aimed to analyze the problems that might occur at the beginning of the year 2005 as a result of the transition from Turkish Lira to New Turkish Lira and propose a number of remedial solutions.

Another project conducted by the Department of Management is named “Assessing the Public View of Tourism” and was carried on between the dates October 2004 and February 2005. This project was conducted with the objective of assessing the public view against tourism and tourists and generating knowledge which can be utilized in designing local policies for enhancing tourism in the future.

The project named “Urban Tourism and Developing Tourism in Izmir” is still being carried on by the Department of Management. This project aims to assess tourism in urban localities and propose solutions to enhance the development of tourism in Izmir.

As of January 2005, the Department of Economics has been carrying on a project named “Improving and Renewing Wholesale and Consumer Price Indices”. This project aims to improve and renew the methodology used in calculating wholesale and consumer price indices for Izmir.

These projects reveal that Izmir University of Economics contribute to local economic development through engaging in contract research projects, which indeed aim to stimulate local economic and social development. Izmir University of Economics engages in strong ties with Izmir Chamber of Commerce, which is one of the most prominent institutes of the local institutional base of Izmir. By transferring knowledge through networks with local institutional base, Izmir University of Economics acts as a knowledge node in regional networks. Thus, the University has the potential to become one of the most prominent and active knowledge nodes in Izmir by the role it plays in knowledge generation and network formation.

V. POLICY IMPLICATIONS

Universities are large economic units, which can have an important impact on the local economies in which they are located, even without playing a proactive role in local development. The very magnitude of the presence of a university has economic development implications, as they are large complexes that employ hundreds of workers. Combined with the spending impact of its students, a university creates a significant direct and induced effect on income generation and employment creation.

Besides its expenditure effects, a university is an important knowledge node in the regional innovation networks by the role it plays as a knowledge generating and transferring institution. Moreover, a university has the potential to act as an incubator and help foster the development of spin-off firms and more actively involve in local development.

Within this perspective, analyzing the expenditure and knowledge generating impacts of universities is important for both local and national policy makers. Local policy makers can make use of the results of the expenditure impact analysis in determining policies for the future. Moreover, local and national governments can support the knowledge generating role of the university in training human capital, engaging in research activities, encouraging entrepreneurial culture in local communities, fostering innovative activities and spin-off company formation. Hence, by supporting the activities of higher institutions of education, governments can make a significant contribution to local and national economies.

CONCLUSION

Universities are often significant economic units in terms of income generation as well as employment creation. Besides their unquestionable role in knowledge generation and transmission, universities act as a large employer and consumer of goods and services and their economic impact on the local community are usually quite significant. Thus, the very presence of a university contributes to the economic growth of its community. Thereby, it is of great importance to assess and acknowledge the economic impact of a university on its local community. The significance of the issue has necessitated a need to conduct a case study in order to estimate the expenditure impact of Izmir University of Economics on its local economy in terms of income generation and employment creation.

Universities contribute to the economy in which they are located through direct, indirect and induced effects on local income generation and employment creation. Direct effects arise from the direct expenditure made by the university for its operations and maintenance and from the expenditures of its students and visitors. Indirect effects are the consequences of spin-offs in demand, which are triggered by the direct expenditures of the university, students and visitors. Induced effects are the result of the university's spending on wages and salaries that induce a continuous chain of proportionate re-spending and employment according to the marginal propensity to consume. This induced effect is the well-known "Keynesian multiplier process". This study has shown that it is possible to estimate fairly accurately the direct and induced impact of Izmir University of Economics on Izmir Metropolitan Area by using a previously developed and refined model.

This study consists of three chapters. The first chapter presents the theoretical framework of regional development, which is indeed necessary in assessing the role of universities in local and regional development. The first section clarifies some of the fundamental concepts of regional development such as learning regions, innovation and regional synergetic networks and sheds light on their association with universities. The second section deals with some of the fundamental theories of regional development to simplify the assessment of the University's spending and knowledge impacts in the following chapters. These theories can be listed as the economic base model, the theory of localization economies and agglomeration economies, new industrial districts and flexible specialization, the product cycle model, the innovative milieu approach, entrepreneurship and regional development and the theory of regional networks.

The second chapter intends to conceptualize the role of universities in local economic development. The first section deals with the backward (expenditure) and forward (output) linkages of the university with its local economy. Then, the methodological approaches used in the expenditure impact analysis are introduced and some weaknesses of the regional multiplier analysis are discussed. These specific approaches are the Keynesian Income-Expenditure Approach and the Input-Output Approach. Next, a brief literature review of the university economic impact analysis is presented. Moreover, knowledge impacts of universities on their local economies are assessed. Universities contribute to their local economy by the knowledge generating role they play, which includes developing human capital, establishing university-business partnerships and engaging in entrepreneurial activities and thereby enhancing local and national economic development.

The third chapter is a case study, which illustrates some of the backward or expenditure linkages between Izmir University of Economics and Izmir Metropolitan Area in terms of local income generation and employment creation for the fiscal year 2004. In this study, the methodology used is the model refined by Huggins and Cooke (1997) to measure the economic impact of Cardiff University on the local economy, which is indeed a previously defined model first by Bleaney et al. (1992) for Nottingham University and then by Armstrong et al. (1994) for Lancaster University. The induced impact of the University on the metropolitan economy is calculated in terms of gross local output and local disposable income.

Data on university expenditures have been extracted from the University's financial statements to estimate the direct and indirect effects of the University's expenditures on staff salaries, wages, goods and services. The direct effect of the University's expenditures on staff salaries and wages has been estimated as 5 million YTL and the direct effect of the University's expenditures on goods and services has been estimated as 14.6 million YTL in the fiscal year 2004. All of the invoices were examined to determine the proportion of goods and services that are purchased in Izmir Metropolitan Area by the University. The study revealed that 87% of the University's spending on goods and services were from local suppliers, which make a direct income contribution of approximately 13.1 million YTL to the Izmir metropolitan economy.

The direct employment impact of the University was assessed using data obtained from the Registrar's Office. In the academic year 2003-2004 Spring semester, the University created 372 jobs, of which 142 is full-time academic staff position, 177 is

part-time academic staff position and 53 is administrative staff position. In the academic year 2004-2005 Fall semester, the University created 444 jobs, of which 198 is full-time academic staff position, 180 is part-time academic staff position and 66 is administrative staff position.

In order to assess student expenditures in Izmir Metropolitan Area, a survey of 200 students was undertaken to estimate the average weekly expenditure per student and the proportion of student spending in Izmir Metropolitan Area. In this study, all the full-time students are considered as “net new” as it is assumed that they would be attending private universities in other cities if Izmir University of Economics had not existed. The results of the study revealed that the average weekly expenditure per student was 220 YTL. Total student expenditure in the year 2004 was calculated by multiplying the average weekly expenditure per student by the number of students and number of weeks in each academic year. Moreover, the survey revealed that 92% of student expenditure stayed in Izmir Metropolitan Area.

Next, in order to establish the economic impact of staff employment and spending, staff details on residence were extracted from the personnel database and it was concluded that 99% of university employees reside within Izmir University of Economics. In addition to that, a survey of 80 academic and administrative staff were undertaken to estimate the proportion of spending by the University’s staff in Izmir Metropolitan Area. This study revealed that 95% of the staff spending stayed within Izmir Metropolitan Area.

Induced effects on income are estimated by implementing the survey results and the financial data extracted from the University's financial statements for the fiscal year 2004. After 12 rounds of estimation, total gross local output is estimated as 55.65 million YTL and total local disposable income is estimated as 33.63 million YTL.

Five different multipliers are calculated in this study. These are gross local output multiplier, local disposable income multiplier, expenditure base multiplier for gross local output, expenditure base multiplier for local disposable income and basic Keynesian multiplier. Gross local output multiplier is estimated as 3.14, meaning that 1YTL of initial increase (decrease) in the value of income defined as labor costs plus University's expenditure in Izmir Metropolitan Area gives rise (fall) to 3.14TL in gross local output. Local disposable income multiplier is estimated as 2.99, meaning that 1YTL of initial increase (decrease) in the value of disposable income defined as the first round impact on disposable incomes of local residents gives rise (fall) to 2.99TL in local disposable income. Gross local output expenditure base multiplier and local disposable income expenditure base multiplier are estimated as 2.84 and 1.72 respectively, meaning that 1YTL of initial University expenditure gives rise (fall) to 2.84YTL in local gross output and 1.72 YTL in local disposable income. Finally, the basic Keynesian multiplier is estimated as 1.56, implying that for every 1YTL gained (lost) to the local economy, a further gross income expansions (reductions) of 1.56YTL income will be gained (lost) through increases (falls) in expenditure on locally produced goods and services. Since all of the estimated multipliers are greater than 1, it is reasonable to conclude that Izmir University of Economics is a major business that contributes substantially to direct and induced income generation in the Izmir metropolitan economy.

In this study, the knowledge impacts of the University on its local economy are assessed as well. It can be concluded that Izmir University of Economics is an important knowledge node in local regional networks. The University adds to the local human capital base by training qualified graduates. In addition to that, the University encourages local entrepreneurial culture and fosters the formation and development of small start-up firms by institutionalizing an incubator named Embryonix. Moreover, the University forms strong ties with Izmir Chamber of Commerce, which is one of the most prominent regional actors in the local institutional base of the city of Izmir and engages in contract research that aim to foster regional economic and social development. Hence, Izmir University of Economics has the potential to become a prominent knowledge node in the local regional networks.

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APPENDIX

A. Derivation of the Keynesian Income Multiplier

Suppose

$$Y = C + I + G + X - M - T_i \quad (1)$$

where

Y = GDP at factor prices

C = Consumption expenditure

I = Investment expenditure

G = Government expenditure

X = Exports

M = Imports

T_i = Indirect taxes

The following identities hold

$$C = C_0 + c(Y_d) \quad (2)$$

$$Y_d = Y - T_d + U \quad (3)$$

$$T_d = td(Y) \quad (4)$$

$$U = -u(Y) \quad (5)$$

$$I = I_0 \quad (6)$$

$$G = G_0 \quad (7)$$

$$X = X_0 \quad (8)$$

$$M = M_0 + m(C) \quad (9)$$

$$T_i = ti(C - M) \quad (10)$$

where

C_0, I_0, G_0, X_0 and M_0 are constant terms. (10a)

Y_d = disposable income

T_d = direct taxation and national insurance contributions

U = transfer payments e.g. unemployment benefits

$C - M$ = locally produced goods and services consumed

By substitution of (3), (4) and (5) into (2)

$$C = C_0 + cY(1 - t_d - u) \quad (11)$$

By substitution of (11) into (9)

$$M = M_0 + mC + mcY(1 - t_d - u) \quad (12)$$

By substitution of (11) and (12) into (10)

$$T_i = t_iC + t_{ic}Y(1 - t_d - u)(1 - m) - t_{iM} - t_{iM}C \quad (13)$$

By substitution of (6), (7), (8), (11), (12) and (13) into (1)

$$Y = cY(1 - t_d - u) + I_0 + G_0 + X_0 - M_0 - mC - mcY(1 - t_d - u) - t_iC - t_{ic}Y(1 - t_d - u)(1 - m) + t_{iM} + t_{iM}C \quad (14a)$$

Collecting Y's together

$$Y - cY(1 - t_d - u) + mcY(1 - t_d - u) + t_{ic}Y(1 - t_d - u)(1 - m) = C(1 - m - t_i + t_{iM}) + I_0 + G_0 + X_0 - M(1 - t_i) \quad (14b)$$

therefore

$$Y(1 - c)(1 - td - u) + mc(1 - td - u) + tic(1 - td - u)(1 - m) = C(1 - m)(1 - ti) + I_0 + G_0 + X_0 - M(1 - ti) \quad (14c)$$

and

$$Y = \frac{C(1 - m)(1 - ti) + I_0 + G_0 + X_0 - M(1 - ti)}{1 - c(1 - td - u)(1 - m)(1 - ti)} \quad (14d)$$

The multiplier will be the total change in GDP(Y) divided by a change in one of the exogenous variables C, G, I or X.

$$K_r = \frac{\Delta Y}{\Delta G} = \frac{\Delta Y}{\Delta I} = \frac{\Delta Y}{\Delta X}$$

Differentiating (14d) with respect to G, I or X gives

$$K_r = \frac{1}{1 - [c(1 - td - u)(1 - m)(1 - ti)]} \quad (15)$$

Equation (15) is therefore the multiplier for GDP at factor prices applicable to an exogenous change in public expenditure, investment or exports.

B. Estimation of the Marginal Propensity to Consume

The marginal propensity to consume for Izmir Metropolitan Area has been estimated by using a simple regression model.

$$C_t = b_0 + b_1 Y_t \quad (16)$$

where C_t is real private consumption expenditures and Y_t is real gross domestic product measured at factor prices.

Data used in the regression is for the period 1987:1-2004:4. The data is extracted from The Central Bank of Turkey, Electronical Data Delivery System. The model has been estimated by Ordinary Least Squares Method using E-Views Econometrics Software.

First, the series have been adjusted for seasonality effects and then they are tested for stationarity by using Augmented-Dickey Fuller (ADF) test. Table 10 illustrates the ADF test results for real private consumption expenditure and real gross domestic product.

TABLE 10: ADF Test Results for Seasonally Adjusted Real Private Consumption Expenditures

Variables	ADF Test Statistic at Level	ADF Test Statistic at first difference	MacKinnon critical value at 5% significance level
C	-1.380261	-8.83061	-2.9035
Y	0.010531	-6.726485	-2.9035

At 5% significance level, the ADF test results indicate that the null hypothesis that the variables have a unit root cannot be rejected for both series, meaning that they are not stationary. Next, they are tested for stationarity at first difference. The ADF test results indicate that the null hypothesis that the variables have a unit root can be rejected for both series. This implies that both series are stationary at 5% significance level. That means that they are integrated of order 1.

Afterwards, the regression model is estimated and corrected for autocorrelation. The regression result is presented in equation (17). Table 11 summarizes the regression results.

$$CSA_t = 670.86 + 0.65YSA_t + 0.79AR(2)$$

where CSA_t is seasonally adjusted real private consumption expenditure and YSA_t is seasonally adjusted real gross domestic product.

TABLE 11: Regression Results for Equation 17.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Dependent var= CSA				
Constant term	670.8572	1056.658	0.634886	0.5277
YSA	0.647318	0.037187	17.40722	0.0000
AR(2)	0.79139	0.092493	8.556176	0.0000
R-squared	0.967479	Adjusted R-squared	0.966508	
Durbin-Watson stat	1.701006	F-statistic	996.6056	

Then, the residual series obtained from the regression is tested for unit root. The ADF test results are presented in Table 11. Since the two series are stationary at I(1) level. Then the stationarity of the residual series has been tested.

TABLE 12: ADF Test Results for the Residual Series

Variables	ADF Test Statistic at Level	ADF Test Statistic at first difference	MacKinnon critical value at 5% significance level
R	-4.903336	-13.84235	-2.9048

At 5% significance level, the ADF test results indicate that the null hypothesis that the residual series has a unit root can be rejected. The residual series is stationary.

To determine the long run relationship between the two variables, the below regression is estimated. Table 13 summarizes the regression statistics.

$$\Delta CSA_t = -8.3407 + 0.6526\Delta YSA_t - 0.2597u_{t-1} - 0.91AR(1)$$

TABLE 13: Regression Results for the Cointegration

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Dependent var= CSA				
Constant term	-8.340671	31.81352	-0.262174	0.7940
D(YSA)	0.652637	0.041022	15.90936	0.0000
RESID01(-1)	-0.259678	0.093536	-2.776244	0.0072
AR(1)	-0.911101	0.06661	-13.67812	0.0000
R-squared	0.821007	Adjusted R-squared	0.812617	
Durbin-Watson stat	1.497468	F-statistic	97.85202	

The coefficient of u_{t-1} is expected to be between 0 and -1 and statistically significant. The coefficient of u_{t-1} satisfies all these conditions. Therefore, one can conclude that in the long run error correction mechanism works and in the log run the regression results are reliable.

Marginal propensity to consume is calculated as:

$$mpc = \Delta C / \Delta Y$$

Therefore, the marginal propensity to consume is the coefficient of ΔYSA_t , which is 0.65.

C. Methodology Used in Student Expenditure Survey and University Staff Expenditure Survey

In order to estimate the direct spending impact of the University's students, a survey is distributed to 350 students. Of these, 275 returned back with the surveys. The surveys were examined and 200 surveys were assessed as adequately answered and reliable. Graduate school students were excluded from the survey as it was assumed that most are from locality and would already be in residence if the University had not existed. The surveys handed out to students are also included at the end of the Appendix.

The survey was made up of two parts. The first part includes expenditures that are done on monthly bases such as rent, utilities, food, clothing, etc. and the second part includes expenditures that are done on yearly basis such as furniture, home appliances, electronic products, home decoration, etc. The school tuition and dormitory fees are not included in the study not to cause the incidence of double counting since the University receives these as revenues. Moreover, student expenditures made on food and stationery goods in the University are not excluded from the calculations since the University buys these services from vendors outside the University. Therefore, including student expenditures in the University campus does not cause the incidence of double counting.

In processing the surveys, yearly expenditures were added to the monthly expenditures after they were converted into monthly expenditures. The calculation of the average monthly expenditure per student was carried on by multiplying the

number of students in each academic year by the number of weeks and the average monthly expenditure per student. The lowest five and highest five extreme values are excluded from the calculations.

To estimate the proportion of student spending outside the Izmir Metropolitan Area, the ratio of the average monthly expenditure outside Izmir Metropolitan Area to average monthly student expenditure was calculated.

In order to estimate the proportion of staff spending on locally produced goods and services 200 surveys were distributed to academic and administrative staff. Of these, 110 responded back. A sample of 80, representing the University's academic and administrative staff was formed and used in the calculations. The composition of the sample survey was as follows: 25% full-time Turkish academic staff, 20% foreign academic staff, 20% Turkish instructors from School of Foreign Languages, 15% part-time Turkish instructors, 10% research assistants and instructors and 10% administrative staff.

The survey distributed to the academic and administrative staff is similar to student survey and includes two parts. The first part includes expenditures that are done on monthly bases such as rent, utilities, food, clothing, etc. and the second part includes expenditures that are done on yearly basis such as furniture, home appliances, electronic products, home decoration, etc. At the beginning of the survey, it was made clear that only the income earned from Izmir University of Economics should be considered in filling out the survey. Moreover, the survey asked for additional income generated by the University staff in the year 2004 by academic related

activities, contract research, teaching, etc. The results yielded that the University staff did not earn a significant amount of additional income. Therefore, additional income was not included in the calculations. The surveys handed out to academic and administrative staff are also included at the end of the Appendix.

In processing the academic and administrative staff surveys, the methodology used in the student survey was followed. Yearly expenditures were added to the monthly expenditures after they were converted into monthly expenditures. Then the proportion of staff spending outside Izmir Metropolitan Area was estimated by dividing the average monthly staff expenditure made outside Izmir Metropolitan Area to total average monthly staff expenditure. This value is further used in estimating the amount of staff expenditure made on locally produced goods and services.

Supplemental Form 1: Student Expenditure Survey

Değerli katılımcı,

Bu çalışmanın amacı, İzmir Ekonomi Üniversitesi öğrencilerinin Ocak 2004 - Aralık 2004 döneminde İzmir Metropolitan Alanı sınırları içinde yaptıkları aylık ortalama harcamalarının tespit edilmesidir. İzmir Metropolitan Alanı dahilinde **Konak, Bornova, Balçova, Karşıyaka, Çiğli, Buca, Narlıdere, Güzelbahçe, Urla, Çeşmealtı, Gaziemir, Kemalpaşa, Aliğa, Foça, Kemalpaşa, Menemen, Torbalı, Bayındır, Selçuk, Seferihisar ve Menderes** ilçeleri yer almaktadır. Bu çalışmanın sonuçları sadece akademik amaçlı kullanılacaktır.

Lütfen birinci tabloyu aylık ortalama harcamalarınızı, ikinci tabloyu yıllık harcamalarınızı göz önünde bulundurarak doldurunuz. Eğer Ocak 2004 – Aralık 2004 dönemi içinde harcamalarınızda değişimler oluyorsa, ortalamasını alınız. Örneğin; Ocak-Haziran ayları arasında 300 YTL, Temmuz-Aralık ayları arasında 350 YTL kira ödediyseniz tabloya iki dönemin ortalaması olan 325 YTL yazınız.

Tablo 1

Harcama Grupları	Aylık ortalama harcama (YTL)	
	İzmir Metropolitan Alanı içinde	İzmir Metropolitan Alanı dışında
Kira, elektrik, su, yakıt		
Gıda		
Giyim, ayakkabı		
Toplu taşıma, şehirlerarası ulaşım		
Motorlu taşıtlar, benzin, onarım için yapılan harcamalar		
Eğlence ve sosyal faaliyetler		
Kişisel bakım, kozmetik		
Kitap, kırtasiye, gazete, dergi		
İletişim		
Sağlık		
Ev temizlik malzemeleri		

Tablo 2

Harcama Grupları	Yıllık harcama (YTL)	
	İzmir Metropolitan Alanı içinde	İzmir Metropolitan Alanı dışında
Yurt		
Beyaz eşya, mobilya		
Ev gereçleri, ev dekorasyonu		
Motorlu taşıtlar, bisiklet		
Elektronik eşyalar, cep tel., USB		

Bölümünüz:

Sınıfınız:

Supplemental Form 2: University Staff Expenditure Survey in Turkish

Değerli katılımcı,

Bu çalışmanın amacı, İzmir Ekonomi Üniversitesi akademik ve idari personelinin Ocak 2004 - Aralık 2004 döneminde İzmir Metropolitan Alanı sınırları içinde yaptıkları aylık ortalama harcamalarının tespit edilmesidir. İzmir Metropolitan Alanı dahilinde **Konak, Bornova, Balçova, Karşıyaka, Çiğli, Buca, Narlıdere, Güzelbahçe, Urla, Çeşmealtı, Gaziemir, Kemalpaşa, Aliğa, Foça, Kemalpaşa, Menemen, Torbalı, Bayındır, Selçuk, Seferihisar ve Menderes** ilçeleri yer almaktadır. Bu çalışmanın sonuçları sadece akademik amaçlı kullanılacaktır.

Lütfen Tablo 1'i aylık ortalama harcamalarınızı, Tablo 2'yi yıllık harcamalarınızı göz önünde bulundurarak doldurunuz. Tabloları doldururken sadece İzmir Ekonomi Üniversitesi'nden kazandığınız geliri dikkate alınız; eşinizin geliri, kira geliri gibi gelir kaynaklarını dikkate almayınız. Eğer Ocak 2004 – Aralık 2004 dönemi içinde harcamalarınızda değişimler oluyorsa, ortalamasını alınız. Örneğin; Ocak-Haziran ayları arasında 300 YTL, Temmuz-Aralık ayları arasında 350 YTL kira ödediyseniz tabloya iki dönemin ortalaması olan 325 YTL yazınız.

Tablo 1

Harcama Grupları	Aylık ortalama harcama (YTL)	
	İzmir Metropolitan Alanı içinde	İzmir Metropolitan Alanı dışında
Kira, elektrik, su, yakıt		
Gıda, sigara		
Giyim, ayakkabı		
Toplu taşıma, şehirlerarası ulaşım		
Motorlu taşıtlar için benzin, bakım, onarım harcamaları		
Eğlence ve sosyal faaliyetler		
Kişisel bakım, kozmetik		
Eğitim ile ilgili harcamalar		
Kitap, kırtasiye, gazete, dergi		
İletişim		
Sağlık		
Ev temizlik malzemeleri		

Tablo 2

Harcama Grupları	Yıllık harcama (YTL)	
	İzmir Metropolitan Alanı içinde	İzmir Metropolitan Alanı dışında
Beyaz eşya, mobilya		
Ev gereçleri, ev dekorasyonu		
Motorlu taşıtlar, bisiklet		
Elektronik eşyalar, cep tel., USB flash memory		

Lütfen size uygun olan seçeneği işaretleyiniz:

..... Akademik personel kadrosunda bulunmaktayım.

..... İdari personel kadrosunda bulunmaktayım.

.....2004 yılı içinde danışmanlık, proje, vb. akademik çalışmalarım sonucunda

..... YTL ek gelir kazandım.

.....2004 yılı içinde akademik çalışmalarım ile ek gelir kazanmadım.

Supplemental Form 3: University Staff Expenditure Survey in English

Dear participant,

The aim of this survey is to estimate the average monthly expenditure of the academic and administrative staff of Izmir University of Economics in the Izmir Metropolitan Area for the period January 2004 - December 2004. Izmir Metropolitan Area includes the municipal districts of **Konak, Bornova, Balçova, Karşıyaka, Çiğli, Buca, Narlıdere, Güzelbahçe, Urla, Çeşmealtı, Gazimir, Kemalpaşa, Aliağa, Foça, Kemalpaşa, Menemen, Torbalı, Bayındır, Selçuk, Seferihisar and Menderes**. The results of this study will be used only for academic purposes.

Please consider your average monthly expenditures in filling Table 1 and your total yearly expenditures in filling Table 2. While filling the tables, consider only the income you earned from Izmir University of Economics; do not consider any source of income such as your spouse's income or rent income. If there are any variations in your expenditures during the period January 2004 – December 2004, then take an average. For example; if you paid 300 YTL during the period January-June and 350 YTL during July-December, then type 325 YTL as the average value of the two periods.

Table 1

Expenditure Groups	Average Monthly Expenditure (YTL)	
	In Izmir Metropolitan Area	Outside of Izmir Metropolitan Area
Rent, electricity, water, heating		
Food, tobacco		
Clothing, shoes		
Public transportation, intercity transportation		
Motor vehicles' maintenance and oil expenses		
Entertainment and recreation		
Personal care, cosmetics		
Education related expenses		
Books, stationery goods, newspapers, journals		
Communication		
Health		
Home cleaning products		

Table 2

Expenditure Groups	Yearly expenditure (YTL)	
	In Izmir Metropolitan Area	Outside of Izmir Metropolitan Area
White goods, furniture		
Home appliances, home decoration		
Motor vehicles, bicycles		
Electronic products, cellular phones, USB flash memory		

Please choose the one that is most appropriate to you:

.....I have earned YTL additional income during the year 2004 with my academic services such as consulting, teaching, project, etc.

.....I have not earned any additional income in the year 2004 with my academic services.