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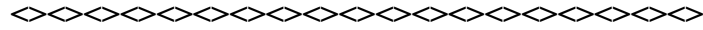
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Editorial Note

The November 2013 issue of the *Journal of International Business Disciplines (JIBD)* has been the result of a rigorous process in two stages:

- Stage 1: all papers that were submitted to the 2013 IABD conference went through blind reviews, and high quality papers were recommended for publication in the *Business Research Yearbook (BRY)*.
- Stage 2: approximately ten percent of the articles published in the *BRY* and one invited manuscript were selected for possible publication in *JIBD*, and the respective authors were contacted and asked to resubmit their papers for a second round of reviews. These manuscripts went through a rigorous review process by the editorial board members and external reviewers. In the end, three articles were recommended by the editorial board for publication in the November issue of *JIBD*.

JIBD is committed to maintaining high standards of quality in all of its publications.

Ahmad Tootoonchi, Chief Editor
Journal of International Business Disciplines

**REGIONAL INNOVATION SYSTEM (RIS): CONSTRUCTION MODEL,
INNOVATION BARRIERS AND PERFORMANCE EVALUATION**

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Ming-ming Hu, Hunan International Economics University, China

Thomas D. Sigerstad, Frostburg State University1

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REGIONAL INNOVATION SYSTEM (RIS): CONSTRUCTION MODEL, INNOVATION BARRIERS AND PERFORMANCE EVALUATION

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ABSTRACT

How to establish and improve regional innovation systems (RISs) is a significant theoretical and practical issue facing Chinese academia and all levels of government. This paper attempts to make an in-depth study of China's RIS construction, the innovation barriers, and innovation performance evaluation. The idea of an RIS construction and, development model as well as policy arrangements are in line with the characteristics and requirements of China's regional economic and social development. The innovation performance evaluation method is of the interest due to the inherent requirements of the RIS. This paper seeks to provide guidance and reference in order to improve the construction of China's RISs.

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INTRODUCTION

The concept of a regional innovation system (RIS) was first proposed by Cooke (1992). He defined the RIS as a system to engage in interactive learning for enterprises and other institutions

via the institutional environment characterized as “embeddedness.” This definition can be further explained by analyzing three aspects: Firstly, “interactive learning” is the equivalent of a collective asset owned by different types of actors in a production system through the interaction and combination of knowledge. Secondly, the term “environment” refers to an open, complex geography, including rules, standards, values, human, and material resources. Thirdly, “embeddedness” includes the processes of creating and reproducing all economics and knowledge inside and outside an enterprise. These processes are generally created and reproduced by a particular form of social interaction. In addition, many domestic and foreign scholars have different definitions for an RIS. Although there are some differences, the basic connotation is uniform, namely: (1) The RIS is a social system, and innovation is the result of social interaction between economic actors; (2) It not only emphasizes the innovation performance of the actors, but it also pays more attention to the interaction between the different actors; (3) Institutional factors are placed in a prominent position and taken into account; and (4) It is for the purpose of promoting regional innovation activities. The RIS concept provides a useful framework for us to further understand the process of innovation in regional economics. Building an RIS is the fundamental guarantee of improving a regional innovation capacity. A perfect and vibrant innovation system can maximize innovation efficiency, reduce the cost of innovation, stimulate effective integration and utilization of resources needed by innovation, and make a variety of services more comprehensive and supplied in a more timely fashion. Therefore, the study of RISs undoubtedly has great theoretical and practical significance.

In recent years, the construction of China's RIS has been continuously developing. In the central regions of China, innovative awareness is enhanced, and innovation input has increased. The area's lower export-oriented economy was less affected by the financial crisis. Industries in the eastern region transfer innovation to industries of the central region depending on the level of innovation development of each industry. Overall though, the eastern regions still have a strong regional innovation capability. The western regions present no overall similar characteristics in innovation capacity. Some areas rise faster, and some decrease rapidly. The strength and efficiency of different regional innovations are quite different. For example, Guangdong and Jiangsu's innovative strength is far ahead of other regions; the innovation efficiencies of Beijing, Shanghai, and Tianjin are far ahead of other regions; the innovation potentials of Chongqing, Inner Mongolia, and Anhui are the greatest. Overall, the current regional innovation capability of China has formed a stable pattern. The eastern regions are the backbone of innovation. Areas with strong innovative ability, such as Tianjin, Jiangsu, Shandong, Guangdong, have a large room for improvement in innovation. At the same time, there has evolved a balanced development of the three larger regions of eastern, central, and western China. However, there is still a long way to go for fully balanced development. The enhancement of innovative ability in the northeast, the old industrial base has a long way to go. The western regions have geopolitical differences and their innovative capabilities also face many difficulties.

BASIC MODEL OF RIS CONSTRUCTION

Based on previous research on RISs and RISs construction practice, a successful construction model of RIS in China can be divided into three main types: Innovation system modes based on industrial clusters, innovation system mode based on active learning, and innovation system mode across various administrative regions.

Innovation System Modes Based on Industrial Clusters

Based on modern regional economic development theory, industrial clusters not only reduce transaction costs and improve efficiency, but also improve incentives to create information and specialized systems. More importantly, the industry cluster can improve the conditions for innovation, and is conducive to the formation of new enterprises. Therefore, the study of the innovation system has been closely linked to the research of industrial clusters. Asheim and Isaksen (2001) thought the RISs were regional clusters surrounded by supporting mechanisms. According to their view, an RIS mainly consists of two types of bodies and the interaction between them: The first is enterprises in the regional leading industry clusters; the other is the basic infrastructure, such as research and higher education institutions, technology diffusion agencies, vocational training institutions, industry associations, and financial institutions. These institutions play an important role in supporting regional innovation. Based on the above definition, Andersson and Karlsson (2002) proposed a cluster-centric RIS structure. For now, the industry cluster-based innovation system is a more advanced model. Some economically developed regions in China, such as Zhejiang and Guangdong, are forming, or have formed such an RIS mode. Qiyang Liu (2003) think that the targets of industrial clusters-based RIS construction must highlight the following aspects: Provide the original innovation supply in specific areas, maintain and enhance the competitiveness of the specific industries and regions, and support their social needs. The RIS construction model based on industry clusters must follow these general principles: maximizing competitiveness, phasing in cluster development, orienting industry and market, having a low-threshold for ease of implementation, maximum sharing of public resources, and positioning interaction between businesses with government. The content structure of the RIS should include the following: strategic positioning of industry guidance and innovative measures; common technology platform-building measures; technology, information and management services support system aiming at SMEs; targeted industrial policies regions can provide; positive incentive investment and innovation; international expansion measures; human capital development system; an atmosphere of encouraging informal exchanges and leading non-governmental organizations (NGOs) into industrial development; and an industry cluster monitoring system. The policies based on industrial clusters promoting the RIS to develop in depth include: closely integrating industrial clusters and RIS construction;

having industrial policies in the region change to industrial clusters and regional innovation policies; establishing the science and technology innovation platform based on industry clusters and form the innovation network with strong innovation abilities; eliminating system barriers of regional industry clusters and integrate regional economic resources; and fostering social and cultural environments to promote industrial agglomeration and regional industrial cluster merging into the global industrial value chain system.

Innovation System Mode Based on Active Learning

Chinese scholars Zhang Yu and Xie Fu Ji (2005) first proposed the theoretical framework of an innovation system based on active learning. Comparing with Freedman & Nelson's innovation system model and Porter's diamond model, an innovation system based on active learning not only emphasizes the links and interactions between innovative actors within the innovation system, but it also emphasizes the interaction between all of the elements of the innovation system. It also stressed that a region's innovation performance depends not only on the internal efficiency of the innovation system, but also on the external efficiency links of the innovation system. Therefore, the analysis framework of the innovation system based on active learning is more suitable for the developing economies, including developing countries and regions, and as well as industrialized countries lagging behind in areas of technology. The main measures of constructing the innovation system based on active learning are as follows: strengthen contact with external knowledge and promote the acquisition of new technology; build a technology proliferation network making the technology transfer centers of universities and research institutions the node, enhancing the role of the institutions in support of technology transfer and diffusion; strengthen the links between local enterprises and companies; and integrate into the global production system access to new technologies.

Innovation System Models Across Various Administrative Regions

The innovation system mode across various administrative regions refers to a system that consists of enterprises, scientific research institutes, universities, and government, all of which are closely linked to various administrative regions and interacts in a unified environment for innovation. China's RIS is based mainly on administrative regions. Under the current administrative system, the kind of innovation system tends to strengthen the awareness of administrative regions, artificially cut off innovation contact, and even to some extent limit innovation and the flow of the main elements, especially in the case of conflict between regional interests and business interests, which reduce the efficiency and capabilities of the RIS, and even the national innovation system. With the intensification of production globalization and

regionalization, the refinement of division of labor, and the extension of the industry value chain, there is an increasingly close cooperation between the regions. Various administrative cooperation and integration processes become the main trend of regionalization development. With the strengthening of ties and cooperation between the main innovations in the neighborhood, some innovation systems across administrative regions are taking shape. Chinese scholar Kaiyuan Long (2004) put forth the theory of an innovation system based on various administrative regions. The key points are: (1) the various administrative innovation systems are characterized by innovation diversification, intensive linkages across regions, as well as a clear division of labor of innovation activities in multi-administrative regions; (2) the basic construction framework of the innovation system across regions mainly include the overall coordination mechanism and system, the common market and the environment, geographical division of labor and collaboration mechanisms, and their networks; (3) the formation and evolution of the innovation system across administrative regions is divided into a nascent stage, the webs stage, and systematic stage; (4) the construction barriers and problems of the innovation system across administrative regions are prominent administrative barriers, different innovation environment, as well as the weakness of common environmental construction; and (5) the main measures of constructing an innovation system across administrative regions include jointly carrying out strategic research and planning on innovation and development, establishing coordinating institutions of the innovation system across administrative regions, accelerating the construction of interconnection and infrastructure, opening up and sharing scientific and technological resources, jointly building innovative carrier and technology trade markets, and carrying out joint research on major science and technology projects.

Comparison of Three RIS Construction Models

China's three successful RIS construction modes can be compared based on the three aspects of the mode characteristics, policy recommendations, and typical regions (Table 1). These modes are similar when emphasizing knowledge links between the main innovations, but these links create a difference within and outside the region, which is an essential characteristic.

If there is a lack of local main innovation in some regions, it is appropriate to build an innovation system based on active learning. If industrial clusters develop, it is better to build the innovation system based on industrial clusters. If there are close links among regions, construction across districts should be closely inter-regional, and the innovation system across administrative regions should be built. Previous studies have demonstrated that the construction of RISs doesn't have an optimal mode. Only by recognizing the local realities can the optimal mode be chosen. China has major differences in its regions, and its innovation resources and the environment vastly differs in these regions. The regional stages in innovation system construction are also different. We

can't simply copy the experience of a developed RIS in other regions. We should consider the characteristics and advantages for different economic and technological development of different regions to highlight regional characteristics and advantages while cultivating and developing local industrial clusters.

TABLE 1. COMPARISON OF THREE MODELS

Mode	Characteristics	Policy Recommendations
Innovation system mode based on industrial clusters (Used in developed region)	<ul style="list-style-type: none"> ● Developed industrial clusters ● Frequent communication in a region 	<ul style="list-style-type: none"> ● Closely combine industrial clusters and the construction of innovation systems ● Transform industrial policy to promote industrial clusters and regional innovations ● Establish a scientific and technological innovation platform and form a network of scientific and technological innovation exchange ● Eliminate institutional barriers for regional industrial clusters, integrate regional economic resources, and foster a regional socio-cultural environment ● Bring regional industrial clusters into the global industry value chain system
Innovation system mode based on active learning (Used in developing region)	<ul style="list-style-type: none"> ● Lack of relevant local entities ● Knowledge is closely linked inside and outside a region 	<ul style="list-style-type: none"> ● Obtain new technologies by strengthening contacts with external knowledge sources ● Build a technology diffusion network by creating technology transfer centers at universities and research institutions ● Strengthen the link between local enterprises and multinational companies, and integrate them into the global production system
Innovation system mode across various administrative regions (Used in urban agglomerations)	<ul style="list-style-type: none"> ● Diversified innovation entities ● Intensive contact across various regions ● Clear division of labor in innovation activities across various regions 	<ul style="list-style-type: none"> ● Jointly carry out strategic research and planning on innovation and development ● Establish a coordinating body for the innovation system ● Accelerate the construction of interconnections and infrastructure ● Implement scientific and technological resources open and shared with all entities ● Build a joint innovation support program ● Build a joint technical trade market ● Carry out joint research on major scientific and technological projects

In order to promote the construction of an RIS, inter-regional links and interactions must be emphasized. An important feature of the innovation system is the closed and complex network relationships between subjects in the system. With a higher degree of networking, the ability to innovate is stronger. Therefore, the construction of RISs must avoid duplication, being closed and restrictive in some areas. We should respect regional economic development, pay more attention to economic regions with strong internal economic ties, and cultivate collaborative networking of regional innovation across provinces and cities to realize a grander scale of coalition and cooperation.

The three RIS construction modes are not mutually exclusive, but rather complement each other. For example, Shenzhen, not only emphasizes the development of competitive industry clusters, such as high-tech, modern logistics, financial services and cultural industries, but also actively integrates into the Pearl River Delta, and has close links with domestic and overseas scientific research institutes and institutions of higher learning.

Therefore, the construction of China's RISs is a long and complex process, which must rely on the long-term unremitting efforts of local governments and enterprises. With the continual push forward of the construction of RISs, the construction mode should be dynamic rather than the static.

CHINA'S REGIONAL INNOVATION BARRIERS, THEIR MEASUREMENT, AND POLICY RESPONSES

The innovation barrier refers to factors hindering innovation activities in the RIS. The research on regional innovation barriers stems from Isaksen's (2001) pioneering work. He identified three types of barriers that impede innovation activities in the RIS: organizational thinness, fragmentation, and lock-in. Although the RIS exists, a closed and rigid network of the system will result in a "locked" state. Most of the subsequent policy research on RISs is based on the study mentioned above. The discussions of the regional innovation barriers, measurements and the policy responses, such as Tidting and Tripp's research (2004), help further expand policy research on RISs.

Classification of Innovation Barriers

The report of "China's regional innovation capacity", researched, edited, and published by the

China Science and Technology Development Strategy Research Group, is one of China's most influential writings about regional innovation capability evaluation. The report concluded that regional innovation capability is reflected in transforming knowledge into new products, new processes, and new services. This capability is made up of five elements, and we classify the regional innovation barriers in accordance with them:

(1) Knowledge creation barriers

Knowledge creation capability is the basis of a technological innovation in a region. Innovation is the process of transforming knowledge into new products, new processes, and new services; so, no knowledge, no innovation. "Knowledge" refers to scientific and technological knowledge directly serving in innovation. Knowledge creation barriers mainly refer to the lack of government investment in science and technology. This results in the main bodies of knowledge creation, such as universities and research institutions, providing low-levels of knowledge creation. Scientific and technological personnel are often lacking and the efficiency of knowledge creation is still relatively low.

(2) Knowledge acquisition (or knowledge flows) barriers

The innovation in a region is isolated and closed without knowledge flow, so innovation is not systemic. Many studies have shown that the aim in establishing innovation systems is to promote the flow of knowledge of a country or a region; in particular, to promote the effective flow of knowledge between research and development institutions, enterprises, and intermediary organizations. Knowledge acquisition barriers are mainly reflected in linkages which are not close enough between enterprises and research institutes, as well as colleges and universities. At the same time, there is a larger gap in scientific and technological cooperation, technology transfer, and attracting foreign investment. In addition, deficient aspects of the environment for innovation, such as infrastructure and, the financial environment for enterprise technology development may also affect the capabilities of knowledge acquisition.

(3) Enterprise innovation barriers

Higher education institutions as well as, research and development institutions are an important source of knowledge creation, but in the RIS, the enterprise is the main actor. Enterprises directly transform new technologies into commodities and interface with the market. At the same time, the market effectively leads the direction of science and technology research through enterprises. The weakness of innovation capabilities of enterprises seriously restricts the development of the RIS.

(4) Innovation environment barriers

Innovation environment refers to the environment for the generation, flow, and application of knowledge. Environmental factors that affect the RIS include the innovative service level, the developing level of the innovation infrastructure, the level of regional market demand, the quality of workers, the innovation fund, the financial environment, and levels of entrepreneurship. The biggest advantage of the innovation barriers classification is that it is easy to quantitatively measure and can provide more targeted policy recommendations for the construction of China's RISs.

Measurement of Innovation Barriers

As mentioned above, the biggest advantage of the classification of the innovation barriers is that it is easy to make the quantitative measurement. Therefore, the "absolute innovation barriers" and "relative innovation barriers" characterizing the size of the innovation barriers are proposed.

(1) Absolute innovation barriers

Absolute innovation barriers are mainly used to characterize the level of development of regional innovation barriers noting that the greater the values, the greater the innovation barriers. The formula is as follows:

$$B. = \frac{1}{E} \times 100 \quad (1)$$

B.: absolute innovation barriers E: utility value of the index of regional innovation ability

(2) Relative innovation barriers

Relative innovation barriers are mainly used to characterize the imbalance of regional innovation barriers noting that the larger the values, the greater the differences of the levels among the various innovation barriers in a region. The formula is as follows:

$$B_r = \sum_{i=1}^{n-1} \sum_{j=i+1}^n |R_i - R_j| \quad (2)$$

B_r: relative innovation barriers R_i, R_j: national rankings of innovation capacity of the regional utility values n: numbers of indicators of innovation barriers

By using formula (2), people can understand that relative innovation barriers are calculated by the national rankings data of the utility value of the index of innovation ability rather than the utility value of the data. The utility values of the index of innovation capability are not directly comparable.

Innovation Barriers and Policy Responses

(1) Policy responses to knowledge creation barriers

Increasing investment in science and technology is an important way to generate new knowledge. Government should establish a stable increasing mechanism of fiscal investment in science and technology to ensure that the growth rate of science and technology funds is significantly higher than that of the fiscal regular revenue growth, and to gradually increase the proportion of fiscal investment in science and technology in GDP. Government should adjust and optimize the investment structure, and strengthen support for basic research, cutting-edge technology, social studies, science and technology basic conditions and popularization. Government should enhance its ability to mobilize the whole society to allocate resources, and to form a diversified, multi-channel, high-efficiency investment system in science and technology.

The lack of scientific and technological personnel is the major reason for generating knowledge creation barriers. Having all kinds of expertise, especially high-quality and high-level innovative talents, is the basis of building an RIS. There should be increased efforts to train personnel. Relying on a major talent training plan, and scientific and technological projects, can develop a number of technological leaders and synergize talents, such as between strategic scientists, academic leaders of advantageous disciplines, and scientific and technological entrepreneurs. Second, there should be efforts to attract talent. Finally, there should be the establishment and improvement of the talent evaluation and incentive mechanism, including establishing an evaluation index system of creative talents focused on performance and ability, actively exploring the technical elements of capitalization, encouraging technology, management, and other factors in distribution, and improving the income distribution system and the talent incentive mechanism.

The construction of a public technology platform can greatly improve utility of and conserve social resources. The platform is also commonly used in the practices of developed countries to improve the level of corporate research and competitive strength, and to develop and construct the public technical service platform for the majority of small and medium-sized enterprises. At some point, there should be a speeding up of the construction of the public technology platform composed of multiple entities, such as government, enterprises, universities, and industry organizations, operated by market mechanisms, opened for society, and providing services for SMEs.

(2) Policy responses to knowledge acquisition (or knowledge flows) barriers

Cooperative innovation can combine the advantages of enterprises, universities, and research

institutions, which is an effective way to promote regional innovation activities. For their own needs and conditions, enterprises should make full use of external technical superiority to make up for their lack of innovation and reduce the risk of lost innovation. Research institutions should be consciously market-oriented, strengthening cooperation with enterprises and promoting the rapid transformation of scientific and technological achievements. At the same time, there should be a strengthening of the construction of science and technology parks at universities and improving the output and conversion rates of scientific and technological achievements.

Foreign direct investment brings capital and equipment. At the same time, it also brings production technology, management techniques, and a large number of technical tactics, which significantly improve the region's level of industrial technology and optimizes the industrial structure. Although China has become the best at attracting foreign investment in the world, the problem is that the quality is not high and the geographical distribution is distinctly un-balanced. In order to attract foreign investment actively, effectively and safely, Jingyan Hu, Secretary of Trade in Services, Chinese Ministry of Commerce, raised nine considerations: (1) Provide classification guidance on foreign investment, and further develop the role of foreign investment in promoting regional economic developments; (2) Strengthen the guidance to optimize the industrial structure of foreign investment and encourage multi-national corporations to set up more R&D centers in China; (3) Encourage domestic research institutions and enterprises to cooperate with multinational corporations and maximize the technology spillover effects of foreign investment; (4) Vigorously develop a service outsourcing and actively undertake the multi-national outsourcing business to promote the development of a modern service industry; (5) Encourage foreign investment in the form of mergers and acquisitions; (6) Improve the evaluation index system of foreign capital quality and improve the level of foreign investment management; (7) Strengthen the supervision of foreign-invested enterprises and place emphasis on corporate social responsibility; (8) Further accelerate the development of the National Economic and Technological Development Zone to serve as a leading model; and (9) Further improve the environment for foreign investment, especially the soft investment environment.

Science and technology intermediary institutions mainly refer to institutions providing social and professional services for scientific and technological innovation bodies to support and promote innovation activities. These institutions include productivity promotion centers, technology business incubators, technology consulting and evaluation agencies, technical trading institutions, and venture capital investment service agencies. These institutions promote the integration of government, business, industry, science, and research, and jointly promote the regional innovation system's development. Additional measures to promote the development of China's science and technology intermediaries are as follows: strengthen the government's policy guidance on science and technology intermediaries, vigorously supporting the development of various scientific and technological intermediaries; strengthening the cultivation of employees of

scientific and technological intermediaries, promoting the construction of a network platform of science and technology intermediaries. The credit environment of the region is very important to the flow of knowledge within the RIS. A good regional credit environment helps reduce transaction costs of various actors in the RIS and helps enhance the flow of knowledge within the system. The flow of knowledge requires a social environment of good credit and compliance within the rules of the game. Therefore, in the process of building an RIS, there needs to be a social credit environment from moral, legal and intermediaries' points of view, and a favorable social environment for enterprise technology innovation.

(3) Policy responses to the innovation barriers

Years of experience tells us that there is a simple technology-oriented tendency of research and development activities in scientific research institutions, which focuses on the advance of technical parameters and indicators, but lacks significance when it comes to the laws of market demand and is often behind in terms of marketing timing. This is the root cause of the low technological achievements conversion rates in many years. Under the conditions of a market economy, enterprises are the main economic entity. Technological innovation activity is essentially an economic process. It is the enterprise that adheres to the marketplace and reflects market demand. In order to promote the enterprise to become the main entity of technological innovation, it is important to create a favorable policy environment. It is important to support an enterprise through the project, but even more important this support should be characterized by long-term policy. Only policy can truly mobilize hundreds of thousands of businesses to invest in technological innovation. Second, there should be vigorous support for the innovation activities of SMEs. Third, there should be support for enterprises to establish research institutions and engineering technology development and research centers, encourage universities and research institutes to enter into the enterprises' technological innovation institutions, encourage qualified enterprises to technically cooperate with foreign companies and large corporations, and establish a number of technology research and development centers, which are open and integrated at the foreign advanced level.

Industrial clusters keep enterprises and their trading partners, customers, suppliers, as well as education and R&D institutions in close contact. Industrial clusters enable an enterprise to better understand the market, provide differentiated products and new products to meet market demand in a timely manner, which can help the enterprise's product innovation and market innovation, improve its own research and development capabilities, strengthen the technical contact between enterprises within the group and technology diffusion, and promote the technological advances of the whole industry cluster. Through industrial clusters, many enterprises can integrate on the basis of specialization and cooperation and the organizational structure can constantly adjust, which accelerates the enterprise's organizational and institutional innovation. Asheim and Isaksen (2002) think an RIS is the regional cluster that is surrounded by supporting and

supported mechanisms. Liuqin Chen (2005) researched policies based on industry clusters for promoting an RIS to develop in depth: Closely combining industrial clusters and RIS construction, transforming from industrial policy into industrial clusters and regional innovation policies within a region, establishing a scientific and technological innovation platform based on industrial clusters and forming a network of scientific and technological innovation with strong creative ability, making efforts to eliminate the institutional barriers of regional industrial clusters, and integrating regional economic resources, fostering the social and cultural environment to promote industrial agglomeration areas, and promoting regional industrial clusters to integrate into the global industry value chain system.

Government procurement has the force of policy and has huge purchasing power. The procurement of how much, to whom, and how to procure it, will have a direct impact on corporate behavior. Government procurement in favor of independent innovation products and services will greatly stimulate the supply-side independent innovation enthusiasm. In developed countries, it is a common practice to implement government procurement policy supporting independent innovation, and promote technological innovation, product innovation, and upgrading of industrial structure by using government procurement leverage. Government procurement focusing on independent innovation is not automatic but rather is determined on the basis of bidding for innovation that has the most utility.

In relation to higher levels of technology products and services, government can set the factor minimum value of independent innovation, and independent intellectual property rights, and score them. When government procurement occurs, the products and services of independent innovation may be appropriate to be given price concessions.

(4) Policy response to innovation environment barriers

Innovation infrastructure refers to the utilities to provide services to the local innovation systems, which is an important condition for the construction of an RIS. Innovation infrastructure includes public libraries, public laboratories, public meeting rooms, public information service agencies and other physical facilities (also a public space for the exchange of ideas), and universal coverage of basic education, technical training of labor, entrepreneurship training, and other intangible services. Jici Wang (2001) thought that modern innovation infrastructure should emphasize the interaction between the main innovators, and create conditions for the exchanges and cooperation among them.

There should be a gradual establishment and improvement in diversified technology investment and financing systems based on government funds for guidance, enterprise investment as a

mainstay, financial institutions for the assistance, social capital and venture capital providing direction, and the guiding role of government investment. We should also enhance the ability of government investment to mobilize all of the society resource allocation through financial direct investment, tax incentives, and other financial investment, actively cultivate multi-form and multi-level risk investment entities, broaden the sources of funds, optimize the supply of venture capital, improve the venture capital exit channels, improve the credit rating standards and restraint systems of venture capital intermediaries, and establish and improve risk investment laws and regulations, and form sound development on a risk investment mechanism.

In order to speed up the pace of scientific and technological development and relevant legislation, the technology regulatory system and the protection of intellectual property rights should be a major focus. There should be research on and the formulation of the legal system around the key tasks of scientific and technological work, such as technology conditions platforms, science and technology intermediary institution-building; fully implementing "Scientific and Technological Progress Law," "Patent Law," "Promotion Law on the Transformation of Scientific and Technological Achievements," and other scientific and technological regulations and laws; making great efforts to strengthen legal advocacy of intellectual property rights and talents training; and establishing and improving the intellectual property management system of enterprises and research institutions.

AN EMPIRICAL STUDY ON PERFORMANCE EVALUATION

Innovation performance refers to the allocation efficiency of innovation resources. It is an important indicator of how to examine the operational state of an RIS. Previous studies have demonstrated that the data envelopment analysis (DEA) method can be used to analyze and compare the innovation performance of an RIS. Shunzhong Liu and Jiancheng Guan (2002, 2003) used the DEA method to analyze the characteristics of China's RIS and to evaluate the performance of each innovation system. According to the characteristics of the innovation system and innovation performance, they classified the various regions of China's RISs into different categories, and put forth recommendations about how to make regional innovation policy for each type of innovation system. Nasierowski and Arcelus (2003) also used the DEA method to investigate the efficiency evaluation of OECD national innovation system.

On the basis of previous studies, the intension is to carry out more in-depth discussion from the following aspects: (1) Use of a variety of DEA Models; (2) Expand one year of data to four years of data to increase the amount of information; (3) Re-examine the choice of input and output indicators; and (4) Consider some premises to use the DEA method, such as an isotonic

assumption (that is, the increase in the quantity of inputs and the number of outputs will not lessen). Ignoring these problems may lead to an error in the selection of indicators.

DEA's Basic Principle

DEA is the method used to evaluate the relative effectiveness of the same type of sectors (or units). The basic principle of measuring the efficiency is based on Pareto optimization. In the following ways, the decision-making unit is efficient: (1) Unless you add one or more inputs or reduce some of the other outputs, until output can no longer be increased; and (2) Unless there is a reduction of outputs or an addition of other inputs, until inputs can no longer be reduced. DEA's development began in Farrell's conception (1957) of default function type "non-parametric frontier analysis." After that, the CCR models developed by Charnes, Cooper & Rhode (1978) extended the Farrell's "single-input & single-output efficiency measurement model" to a "multi-input & multi-output model," and named the efficiency measurement method the "data envelopment analysis," that is "DEA." Later, the BCC model of Banker, Charnes & Cooper (1984) further broadened the CCR model's assumption of constant scale returns and considered the case of non-fixed production scale. This production function based on linear programming techniques to achieve the relative efficiency has the biggest advantage because it does not need to preset a function form when analyzing, to avoid the problem of predetermining the model. At the same time, DEA can handle the efficiency evaluation questions of "multiple outputs & multi-inputs." The model can self-assess weight and avoid the problem of determining the weight subjectively.

The basic idea of the DEA method for evaluation of an RIS regards provinces, municipalities, and autonomous regions of the innovation performance assessment as a decision-making unit (DMU). Suppose there are n DMU, each DMU_j ($j=1\dots n$) uses m innovation input x_{ij} ($i=1\dots m$), and produces s kinds of innovation output y_{kj} ($k=1\dots s$). Charnes, Cooper & Rhode (1978) blended the situation of "multi-input, & multi-output" into a situation of "single input & a single output" using weight coefficient v_i , u_k , and made the "virtual" output-input ratio as the efficiency measurement of the DMU. Therefore, if you want to evaluate a decision-making unit j_0 , we can construct the following CCR model:

$$(\bar{P}) \left\{ \begin{array}{l} \max \frac{\sum_{k=1}^s u_k y_{kj_0}}{\sum_{i=1}^m v_i x_{ij_0}} = V_{\bar{P}} \\ s.t. \frac{\sum_{k=1}^s u_k y_{kj}}{\sum_{i=1}^m v_i x_{ij}} \leq 1, \quad j = 1, \dots, n \\ u_k \geq 0 \quad k = 1, \dots, s \\ v_i \geq 0 \quad i = 1, \dots, m \end{array} \right. \quad (3)$$

Wherein x_{ij} is the j^{th} decision-making unit, the i^{th} inputs; y_{kj} is the j^{th} decision-making unit, the k^{th} inputs; v_i is the weight of the i^{th} inputs; and u_k is the weight of the k^{th} inputs. This is a fractional programming problem.

Using the Charnes-Cooper transformation, we can translate it into linear programming problems of being equivalent and easier to handle.

$$(P) \left\{ \begin{array}{l} \max \mu^T y_0 = V_p \\ s.t. \quad \omega^T x_j - \mu^T y_j \geq 0, \quad j = 1, \dots, n \\ \omega^T x_0 = 1 \\ \omega \geq 0 \quad \mu \geq 0 \end{array} \right. \quad (4)$$

Wherein, $\omega = tv$, $\mu = tu$, $t = \frac{1}{v^T x_0}$

Linear programming (P)'s dual programming is:

$$(D) \left\{ \begin{array}{l} \min \theta = V_D \\ s.t. \sum_{j=1}^n x_j \lambda_j + s^- = \theta x_0 \\ \sum_{j=1}^n y_j \lambda_j - s^+ = y_0 \\ \lambda_j \geq 0, \quad j = 1, \dots, n \\ s^+ \geq 0, \quad s^- \geq 0 \end{array} \right. \quad (5)$$

In the above dual problem, a limit on the sum of the λ_j constitutes the following different envelope surface of the DEA models:

$\sum_{j=1}^n \lambda_j = 1$, Patterns of Variable Returns to Scale (VRS), this is the so-called BCC model

$\sum_{j=1}^n \lambda_j \leq 1$, Patterns of Non-Increasing Returns to Scale (NIRS)

$\sum_{j=1}^n \lambda_j \geq 1$, Patterns of Non-Decreasing Returns to Scale (NDRS)

Not imposing any restrictions means that the envelope surface is the patterns of Constant Returns to Scale (CRS) and this becomes the CCR model.

The efficiency calculated by the CCR model is referred to as the overall efficiency. The efficiency calculated by the BCC model is referred to as the pure technical efficiency. Two efficiency values divided provide the value of scale efficiency. Pure technical efficiency specifically refers to the effectiveness of the use of the input items of each RIS in each year to determine which the situation of inputs to maximize outputs. The value of pure technical efficiency shows the efficiency of input factors. Scale efficiency shows the appropriateness of the ratio of output and input each year of each RIS. The higher value means a more suitable size and greater productivity.

Selection of Input-output Indicators

Considering the reality of China's RISs and the availability of statistics, selected three types of innovation input indicators, and three types of innovation output indicators to create a performance evaluation example aimed at the RISs of central China.

Input indicators were R & D funding, R & D personnel, and graduate students.

Output indicators were indexed papers from the Engineering Index (EI), the Science Citation Index (SCI), the Index to Scientific & Technical Proceedings (ISTP), the Chinese Social Science Citation Index (CSSCI) as well as the accepted amount of invention patent applications.

The selection of the input-output indicators has the following characteristics: (1) Indexed paper by Chinese Social Science Citation Index (CSSCI) served as an innovation output indicator. This is because a large part of R & D funding and R & D personnel are put into humanities and social science research, and CSSCI is recognized as a science indicator to measure humanities and social sciences, and (2) a graduate student served as an innovation input indicator. This is due to the graduate's more prominent role in the innovation process. The graduate students actively participated in various research activities and became an important force in scientific and technological innovation, which should not be ignored.

Correlation Analysis of Input-output Indicators

The DEA model requires the output and input indicators to meet the isotropic assumption, That is, the increase in the quantity of inputs will not reduce the number of outputs. Therefore, the selected input and output indicators must have a positive correlation. To this end, we use SPSS software to do the Pearson correlation analysis. The results are shown in Table 2. As seen in Table 2, all inputs and outputs indicators have significant positive correlations and meet the isotonic requirements. Therefore, we can use these indicators for DEA analysis.

**TABLE 2. CORRELATION ANALYSIS RESULTS
BETWEEN INPUT AND OUTPUTS**

		R&D expenditure	R&D personnel	graduate students	SCI+EI +ISTP	invention patent	CSSCI
R&D expenditure	<i>Pearson</i>	1	.896**	.852**	.829**	.737**	.831**
	<i>Correlation</i>						
	<i>Sig. (2-tailed)</i>		.000	.000	.000	.000	.000
	<i>N</i>	24	24	24	24	24	24
R&D personnel	<i>Pearson</i>	.896**	1	.764**	.631**	.689**	.844**
	<i>Correlation</i>						
	<i>Sig. (2-tailed)</i>	.000		.000	.001	.000	.000
	<i>N</i>	24	24	24	24	24	24
graduate students	<i>Pearson</i>	.852**	.764**	1	.928**	.656**	.947**
	<i>Correlation</i>						
	<i>Sig. (2-tailed)</i>	.000	.000		.000	.001	.000
	<i>N</i>	24	24	24	24	24	24
SCI+EI+IS TP	<i>Pearson</i>	.829**	.631**	.928**	1	.674**	.815**
	<i>Correlation</i>						
	<i>Sig. (2-tailed)</i>	.000	.001	.000		.000	.000
	<i>N</i>	24	24	24	24	24	24
invention patent	<i>Pearson</i>	.737**	.689**	.656**	.674**	1	.681**
	<i>Correlation</i>						
	<i>Sig. (2-tailed)</i>	.000	.000	.001	.000		.000
	<i>N</i>	24	24	24	24	24	24
CSSCI	<i>Pearson</i>	.831**	.844**	.947**	.815**	.681**	1
	<i>Correlation</i>						
	<i>Sig. (2-tailed)</i>	.000	.000	.000	.000	.000	
	<i>N</i>	24	24	24	24	24	24

** Correlation is significant at the 0.01 level (2-tailed).

Data Source of Empirical Example

In this paper, empirical data mainly comes from the following sources: the China Statistical Yearbook (accepted amount of invention patent application), the China Science and Technology Statistics Yearbook (R & D funding, R & D personnel, included papers in three systems), the Chinese Social Science Citation Index Network (indexed papers in CSSCI), statistics and analysis of China science and technology papers (included papers in three systems), and the China Education Yearbook (graduate students). In addition, we also took into account the lag

time from input to output when making relative effectiveness evaluations using the DEA method. The lag time is one year. The input indicators were selected from the years of 2002 to 2005 and output indicators were selected from the years of 2003 to 2006.

DEA Model Solution

In this study, we used EMS Version1 3.0 software and choose the input-orientated DEA model for a solution. It sequentially computes overall efficiency (EFF_{CRS}), pure technical efficiency (EFF_{VRS}), as well as the efficiency of the non-increasing returns to scale patterns (EFF_{NIRS}), then gets the scale efficiency (EFF_{SE}) using EFF_{CRS} divided by the EFF_{VRS} . Returns to scale are determined under the judgment condition put forward by Fare, et. al. (1985): When $EFF_{NIRS} \neq EFF_{VRS}$, DMU is in the stage of the incremental returns to scale (IRS); when $EFF_{NIRS} = EFF_{VRS}$, DMU is in the stage of decreasing returns to scale (DRS); and when $EFF_{CRS} = EFF_{VRS}$, DMU is in the stage of constant returns to scale (CRS). The calculation results are shown in Table 3.

Table 3 indicates that there are four, two, two and two provinces whose overall efficiency value reaches 100% in 2002, 2003, 2004, and 2005 respectively. The overall efficiency values of Henan, Hubei, and Hunan are greater than 0.9 in the continuous four years, which indicates the innovation performance of these areas is quite good and stable. The overall efficiency value of Anhui increases year by year and also maintains a good momentum of development. The overall efficiency values of Jiangxi and Shanxi are relatively poor and less than 0.9 for three years. As a whole, the mean of overall efficiency value in central China is on the decrease year by year. Therefore, relevant governments should pay more attention to the construction of RISs.

There are two main reasons for the inefficiency of DMUs: the lack of a pure technical efficiency and the lack of scale efficiency. The inefficiency of DMUs resulting from scale efficiency completely includes six provinces, including Henan (2005), Hubei (2005), Shanxi (2004), Henan (2004), Hunan (2004), and Henan (2003), which indicates these DMUs are not producing at the most efficient rate. There are eight provinces that have a lack of both pure technical efficiency and scale efficiency. They are Shanxi (2005), Jiangxi (2005), Jiangxi (2004), Shanxi (2003), Anhui (2003), Jiangxi (2003), Anhui, (2002) and Hunan (2002). Apart from production scale, these DMUs should pay attention to improving efficiency of innovation resource usage as soon as possible. There is not a DMU whose inefficiency results come from only a lack of pure technical efficiency. Additional analyses on returns to scale were made in order to find out the reason why a DMU can't exert efficiency. The results indicate Shanxi and Jiangxi exhibited increasing returns to scale in most years, but inputs of innovation resources should be increased.

Henan was in a state of constant returns to scale in 2002, and exhibited decreasing returns to scale in other years, where input of innovation resources should be decreased properly.

TABLE 3. CALCULATION RESULTS OF EFFICIENCY AND ANALYSIS SHEET OF THE RETURNS TO SCALE PROPERTIES

DMU	EFF_{CRS}	EFF_{VRS}	EFF_{SE}	Returns to scale
Shanxi(2005)	66.43%	68.83%	96.52%	IRS
Anhui(2005)	100.00%	100.00%	100.00%	CRS
Jiangxi(2005)	86.15%	88.24%	97.64%	IRS
Henan(2005)	99.74%	100.00%	99.74%	DRS
Hubei(2005)	91.72%	100.00%	91.72%	DRS
Hunan(2005)	100.00%	100.00%	100.00%	CRS
Shanxi(2004)	86.01%	100.00%	86.01%	IRS
Anhui(2004)	100.00%	100.00%	100.00%	CRS
Jiangxi(2004)	79.59%	89.28%	89.15%	IRS
Henan(2004)	99.42%	100.00%	99.42%	DRS
Hubei(2004)	100.00%	100.00%	100.00%	CRS
Hunan(2004)	98.01%	100.00%	98.01%	IRS
Shanxi(2003)	87.24%	94.50%	92.32%	IRS
Anhui(2003)	92.51%	94.93%	97.45%	DRS
Jiangxi(2003)	83.11%	95.05%	87.43%	IRS
Henan(2003)	99.79%	100.00%	99.79%	DRS
Hubei(2003)	100.00%	100.00%	100.00%	CRS
Hunan(2003)	100.00%	100.00%	100.00%	CRS
Shanxi(2002)	100.00%	100.00%	100.00%	CRS
Anhui(2002)	86.53%	89.54%	96.63%	DRS
Jiangxi(2002)	100.00%	100.00%	100.00%	CRS
Henan(2002)	100.00%	100.00%	100.00%	CRS
Hubei(2002)	100.00%	100.00%	100.00%	CRS
Hunan(2002)	98.47%	99.23%	99.24%	DRS
mean	93.95%	96.65%	97.13%	

CONCLUSION

Based on RIS research and RIS construction practice, China's construction mode of a successful RIS is divided into three main types: industrial clusters, active learning and the trans-regional

innovation mode. Then the basic idea of RIS construction should consider the following: dividing the regional innovation barriers into knowledge creation barriers, knowledge acquisition (knowledge flow) barriers, enterprise innovation barriers and innovation environment barriers, and trying to put forth two new concepts to characterize the size of the barriers and their calculation methods, which are “absolute innovation barriers” and “relative innovation barriers.” Based on these, there should be research on the policy responses aimed at different innovation barriers. Finally, using the DEA method in the analysis of performance evaluation of RISs appears to provide not only utility but comparison between other research findings. Technology innovation is an important source of economic increase and is also an indispensable condition to realize leapfrogging development in the implementation of central China’s current strategy. According to the innovation performance measurement, we found that the RISs of central China have a lack of efficiency of innovation resource usage and scale efficiency, and their development is unbalanced. Looking ahead, each province of central China must face existing problems in the construction of their RISs, and firmly carry it out by focusing on the central task of efficiency to advance the realization of the significant goal of central China’s rising strategy.

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MAKING FINANCIAL SENSE OF THE GROWTH STRATEGY OF JBS: THE WORLD'S MOST ACQUISITIVE MEAT PRODUCER

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ABSTRACT

This paper presents a longitudinal study of the resource-based horizontal acquisition strategy of JBS, the most acquisitive company in the meat producing sector. Its acquisition strategy transformed a relatively small business that was founded in 1953 (comprising a butcher shop and a slaughterhouse located in a small town in the interior of Brazil) into the world's biggest meat producer by 2010. However, the acquisition strategy of the company is not one dimensional, it changes with times and the maturity of the company. A big catalyst of the company's expansion in the late 2000s is the financial assistance from the government, which is very common in Latin America. We further discuss the financial consequence resulting from such a growth strategy.

INTRODUCTION

Mergers and acquisitions (M&A) have been an important means for companies to grow. Notwithstanding their popularity, the path to success through M&A is fraught with dangers. Many companies encountered common post-merger difficulties in areas such as financial structure, company culture and human resources. And the financial performance of the combined company can suffer as a consequence.

On top of that, researchers have noted that while the target's shareholders generally benefited from the premium paid for their shares, shareholders of the acquirer do not usually benefit and often suffered negative returns in the transaction. During the period between 1973 and 1983 with a sample of 343 companies, Asquith, Bruner, and Mullins (1987) found the average return to the acquirer to be -0.85%. More recently, Kuipers, Miller, and Patel (2009), analyzing a sample of foreign acquirers of U.S. targets, concluded that the returns of the acquirers were also negative at -0.92%. The consulting firm Booz-Allen & Hamilton concluded in its study (Adolph et al, 2001) that 53% of all deals failed to achieve the expected outcomes.

In the finance literature, there are basically four types of research methodologies in M&A performance, namely, event studies, accounting studies, executive surveys, and clinical studies (Bruner, 2004). Compared with event and accounting studies, there is a relative paucity of clinical research in the field. This paper contributes to the clinical area of M&A research. We examine the strategies of JBS since its inception to identify the key drivers for M&A. More interestingly, as it became a giant in Brazil, JBS has been pursuing cross-border acquisitions very aggressively. We seek to illustrate whether the company's growth strategy has been beneficial and whether its international acquisition path is sustainable.

The Brazilian company JBS was by far the world's most prolific acquirer in the meat producing sector over the last decade. Since 2007, it has made a breath-taking series of rapid acquisitions that fundamentally shook the global meat industry. This paper demonstrates the success of the company's resource-based horizontal acquisition strategy. Its serial acquisitions transformed a business that was founded in 1953 by José Batista Sobrinho in a small town in the interior of Brazil (comprised of a butcher shop and a small slaughterhouse) into the world's biggest meat producer by 2010.

Based on JBS's growth trajectory, this study discusses the developments of the company in three separate periods. In the first period (1953–2006), JBS engineered its growth mainly through horizontal acquisitions in Brazil and completed the first international horizontal acquisition in Argentina. In the second period (2007–2008), JBS became a public company and pursued aggressive international horizontal acquisitions that started with the acquisition of Swift in the U.S. In the most recent third period (2009–2013), it merged with Bertin (the second largest meat producer in Brazil to JBS at that time) and diversified into the unrelated businesses of Bertin as well. In addition, with the acquisition of Pilgrim's Pride in the U.S., it also diversified into the poultry business. Finally, the paper evaluates the resource-based horizontal acquisition strategy of JBS and the role of the Brazilian Development Bank in financing the growth of JBS.

THE GROWTH TRAJECTORY OF JBS

Generic and Domestic Growth (1953-2006)

In the early 1950s, José Batista Sobrinho started a small business purchasing cattle to resell to slaughterhouses in the city of Anápolis (with a population, at the time, of approximately 50,000). The business grew, and in 1953 Sobrinho opened—with his two brothers—a small butcher shop and a slaughterhouse which slaughtered 5 heads of cattle a day (see Appendix 1 for a timeline of the company's developments). The construction of Brasilia in 1956 (only 162 kilometers from Anápolis) promoted strong economic growth in the region during the 1960s. Sobrinho took advantage of this growth and the tax exemption offered to companies that were willing to invest

in the new capital of Brazil. His company, Friboi, made its first acquisition of a slaughterhouse in a satellite town of Brasilia in 1968 (Polonial, 2007; Bell & Ross, 2008; Salomão, 2009).

Brazil's strong economic growth in the 1960s and 1970s increased the country's beef consumption, and the business prospered. In 1970, Friboi acquired a new slaughterhouse and increased its slaughtering capacity to 500 heads of cattle a day (JBS, 2007a; JBS 2012b). During the 1980s, Friboi invested to expand its processed beef production capacity, and in the 1990s and early 2000s the company began expanding aggressively, acquiring slaughterhouses and increasing its capacity for producing fresh, chilled, and processed beef in Brazil. Between 1993 and 2005, Friboi acquired twelve slaughterhouses and beef processing plants, and became one of the largest beef producers in the country, with a slaughtering capacity of 5,800 heads of cattle a day (Bell & Ross, 2008).

In 2005, with financing provided by the Brazilian Development Bank, Friboi made its first international acquisition by purchasing Swift Armour, Argentina's largest beef producer and exporter (Moreira, 2012). In the same year, Friboi was restructured from a closed family business to a public company and was renamed JBS.

In 2006, the newly renamed JBS increased its slaughter capacity to 22,600 head cattle a day (from the previous 5,800), by acquiring two additional slaughterhouses and beef processing plants in Argentina. With these two additional plants, JBS had twenty-one beef processing plants in operation in Brazil and five in Argentina (JBS, 2007a). The acquisitions in Argentina were apparently motivated by the substantial strength that the Brazilian currency (the real) had against the U.S. dollar in 2006, making foreign acquisitions relatively inexpensive. This strength of the real, on the other hand, put Brazilian exporters at a disadvantage: it presented a revenue challenge for JBS, which exported more than a third of its beef and generated sixty-one percent of its sales through exports to customers in 110 countries even though major international markets, including the U.S., Canada, Mexico, and Korea, were closed to Brazilian beef at the time (Bell & Ross, 2008).

IPO and the Acquisition of Swift in the U.S. (2007-2008)

In March 2007, JBS became the first beef processing company to make an initial public offering (IPO) on the main Brazilian stock exchange (BOVESPA). The company raised almost \$800 mil. in the process (Bell & Ross, 2008). In addition to acquisitions of both slaughterhouses and beef processing plants in Argentina and Brazil in the first half of 2007, in July 2007 JBS surprised the market by acquiring Swift, with operations in the U.S. and Australia, for \$1.46 bil. (JBS, 2008; Bell & Ross, 2008).

A substantial portion of the financing for the acquisition of Swift was obtained by JBS from a capital increase that was finalized in June 2007, in which the Brazilian Development Bank subscribed a portion of the new common shares. Prior to the deal, JBS had a market capitalization of \$4.2 bil. and sales of \$2.1 bil., which were almost five times less than Swift's sales of \$9.5 bil. (JBS, 2008; Salomão, 2009).

Throughout the remainder of 2007, JBS made other major national and international acquisitions of slaughterhouses, beef packing plants, and industrial plants in the areas of beef byproducts and for JBS products packaging. With these acquisitions, the slaughtering capacity of JBS rose from 22,600 heads of cattle a day in 2006 to 51,400. The number of plants increased from 26 in 2006 to 50 at the end of 2007 (21 in Brazil, 7 in Argentina, 12 in the U.S., and 8 in Australia)(JBS, 2008).

Prior to the acquisition of Swift, JBS had a significant growth record, which helped promote the IPO in 2007. From 2004 to 2006, sales rose by 21%, while net income increasing from \$50.2 mil. to \$84.3 mil. The ebitda of JBS, as a percentage of revenue, was: 9.1% in 2004, 9.6% in 2005, and 14.2% in 2006 (the year that the appreciation of the real against the dollar reduced exports of Brazilian beef). These percentages were considered by financial analysts to be far greater than those of other major players in the U.S. beef processing industry (JBS, 2007b). On the other hand, JBS held a high debt load (\$956 mil.) at the end of 2006 (Bell & Ross, 2008).

With the acquisition of Swift in the U.S., JBS became the third largest beef processor in the U.S. (behind Tyson Foods and Cargill Meat Solutions, respectively), and the largest processor worldwide, with holdings in the U.S., Australia, and Europe, as well as Brazil and Argentina. The main purpose for the acquisition of Swift by JBS was to establish operations in other regions besides Latin America, as this allowed JBS to deal more effectively with the currency fluctuations, and to better manage sanitary restrictions and other trade barriers (Bell & Ross, 2008).

In December 2007, JBS announced the purchase of 50% of Inalca, the absolute leader in the Italian beef industry and one of the largest producers of beef products in Europe, with operations in Africa, Russia and various other countries in Europe. The acquisition, at a cost of Euros 225 million, represented a strategic alliance: it created important synergies between products and sales channels, introduced JBS products to key markets throughout Western Europe, and brought Inalca (now Inalca-JBS) into closer contact with the world's main beef suppliers. For JBS, the acquisition represented an important initial step for the company's future growth in European markets (JBS, 2008).

In March 2008, JBS signed an agreement to acquire the fifth-largest U.S. beef processors (Smithfield Beef Group). The proposed JBS acquisition of Five Rivers Ranch Cattle Feeding,

which was part of the Smithfield deal, also took place: making JBS the largest cattle feeder as well in the United States (Johnson, 2009). In addition, JBS also acquired the Australian company Tasman Group, thereby consolidating its leadership in the world meat industry. These acquisitions, according to JBS (JBS, 2009; JBS, 2012b), represented the conclusion of the investment plan for the construction of a sustainable platform for slaughter, production, and commercialization of meat in the U.S. and Australia, which had begun in July of 2007 with the acquisition of Swift's operations in the U.S. and Australia. The total slaughtering capacity of JBS increased from 51,400 heads of cattle per day in 2007 to 65,700 in 2008 (JBS, 2009).

Restructuring and Diversification (2009-Present)

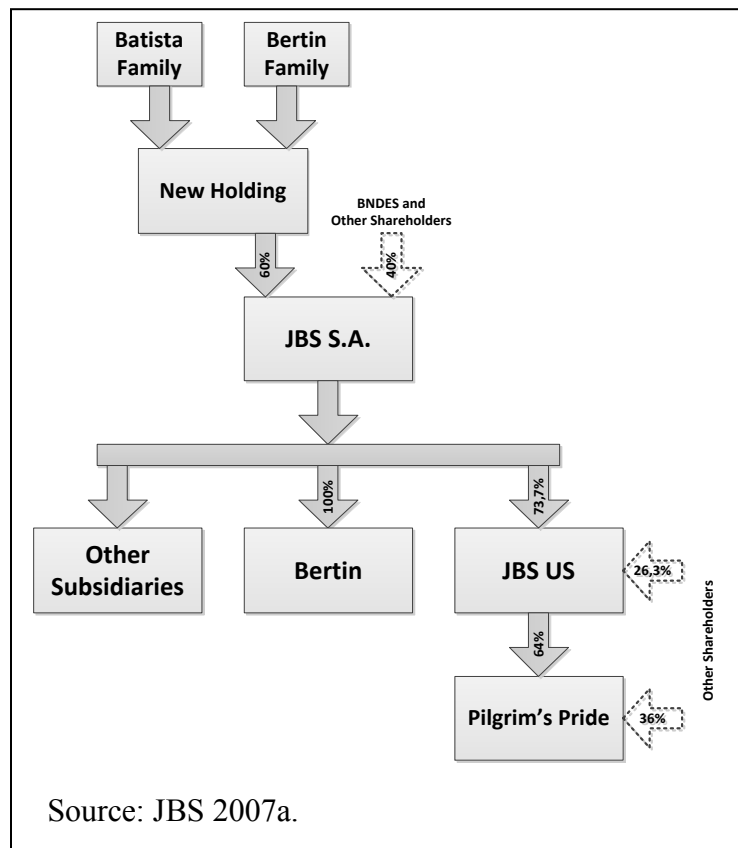
In July 2009, JBS strengthened its production base in Brazil, with the incorporation and reopening of five new slaughterhouse and beef packing centers that had been closed due to financial problems. These slaughterhouses and beef packing centers were equipped to export to major international markets. In the following August, JBS entered a new area with the creation of JBS Couros [Leather] (JBS, 2009). The entry into leather was a logical step, since JBS was the largest producer of beef, and leather is a byproduct of this industry.

In December of 2009, JBS merged with Bertin, the second largest beef packer in Brazil and one of the largest beef exporters in Latin America. The merger agreement reorganized JBS and Bertin and created a new holding company. The Batista Family put all the shares they held in JBS into this company, and the Bertin Family also put the 73.1% of shares they held in Bertin into the new holding company (Figure 1). The holding company then became the controlling shareholder of both JBS and Bertin (JBS, 2009).

The merger with Bertin, besides increasing the market share of JBS in beef packing and leather, diversified the company into areas of prepared foods, pet foods, milk and dairy products, recycling, biodiesel fuels, petrochemical products, personal hygiene and beauty products, collagen, and canning, among others. With the merger, the slaughtering capacity of JBS increased to 90,290 heads of cattle per day. In addition, because Bertin was the largest Brazilian producer and exporter of leather, the merger made JBS the largest leather producer and exporter in the world (JBS, 2010).

During the same month as the merger with Bertin took place, JBS also made another diversifying merger. It acquired 64% of Pilgrim's Pride Corporation in the U.S. and thereby entering into the chicken-processing market. JBS instantly became the second largest poultry producer in the world, with operations in the United States, Mexico and Puerto Rico, and a daily slaughtering capacity of 7.6 million chickens. To finance the acquisition, JBS issued convertible debentures that were subscribed by the Brazilian Development Bank. These debentures were made

mandatorily exchangeable for common shares of JBS USA (in the form of Brazilian Depositary Receipts) if a liquidity event were to occur (JBS, 2010).



**FIGURE 1: MERGER OF JBS WITH BERTIN IN DECEMBER 2009
AND ACQUISITION OF PILGRIM'S PRIDE**

On December 1, 2009, JBS also announced of the acquisition of Tatiara Meat Company (TMC), located in South Australia. The completion of the acquisition occurred in February 2010.

CONSOLIDATION PAINS OF JBS

During 2010, JBS made numerous efforts to resolve pending issues in the merger of Inalca, in which JBS had acquired a 50% interest in December 2007 for Euros 225 mil. Finally, a termination agreement to dissolve the partnership was signed. Through that agreement, the Cremonini group paid Euros 218.9 mil. to purchase JBS's 50% interest. At the same time, JBS also acquired outright control of Rigamonti in Italy, in which it had already held a 70% interest since December 2009 (JBS, 2010).

These many acquisitions landed JBS with \$6.9 bil. in debt, and some market analysts during 2010 expressed concern that the company was overreaching. The firm lost \$160 mil. in 2010 on about \$33 bil. in sales, mainly because of the cost of integrating Pilgrim's Pride and Bertin. As investors became worried, JBS's share price dropped by almost 30% during 2010. Other meat producers, including the main rival of JBS, Tyson Foods, also had income difficulties during 2010, mainly because of spikes in corn prices that increased the costs of raising cattle (Blankfeld, 2011).

In response to the significant drop in the value of JBS shares during 2010, JBS management decided to postpone the initial public offering of its America subsidiary, JBS U.S., which was scheduled for December 2010 and already registered with the SEC. The IPO was required, because the indenture of the debentures issued in December 2009 and subscribed by the Brazilian Development Bank (BNDES) had obliged JBS to convert the debentures into Brazilian Depository Receipts that were backed by the US shares held by JBS. The deadline for this conversion was December 2010, and in the event of postponement, JBS would need to pay a premium of \$300 mil. to the debenture holders as compensation.

Later in December 2010, management decided that JBS would instead pay the premium and postpone the IPO to December 2011 (JBS, 2010; Economia, 2010). In April 2011, the management of JBS announced that they had cancelled the plans for the IPO of its American subsidiary JBS U.S., ignoring the obligation to its main debenture holder BNDES (Olivon, 2011). This decision was undoubtedly motivated by the poor performance of the company shares, which continued the downward trend that had commenced in late 2010. In May 2011, the debenture holders, including BNDES, converted their debentures into JBS shares (Gradilone, 2011).

FINANCIAL PERFORMANCE OF JBS

Similar to many IPOs, the stock performance of JBS after the 2007 IPO never met shareholders' expectations. This is reflected in the poor performance of the company share price. In 2006, the company's ebitda was about 14% of sales. In the same year, Tyson Foods (at the time the world's biggest meat producer) posted a loss (Tyson, 2011). To the disappointment of the investors, with the acquisition of Swift in the U.S. in 2007, JBS had incurred a significant loss in the first year after the IPO, and its ebitda as a percentage of revenue were much lower than that in 2006 before the IPO (Figure 2). As a result, JBS shares have underperformed ever since. Between the IPO in 2007 and April 2012, the growth of JBS share price was only 4.75%; compared with the Brazilian stock exchange index's growth of 37.37% during the same period. On the other hand, in the first half of 2013 JBS's share has declined less than the Brazilian stock index by virtue of it being an internationally diversified company.

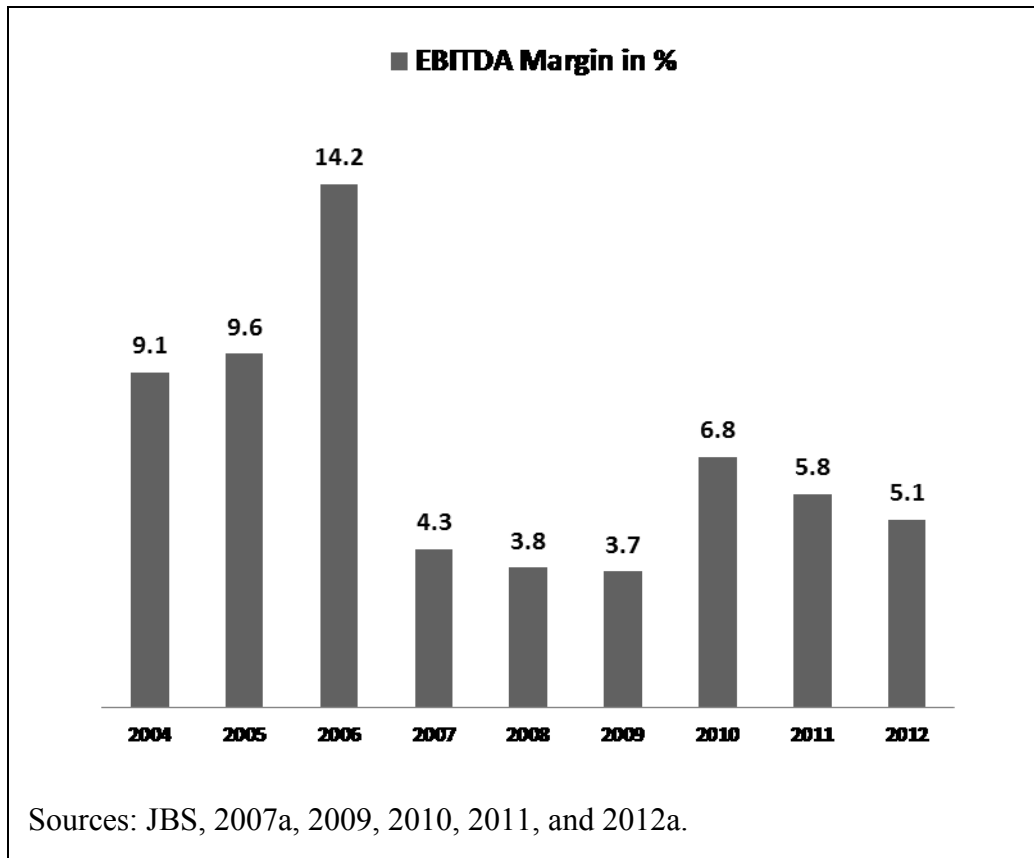


FIGURE 2: JBS PERFORMANCE BEFORE AND AFTER THE 2007 IPO AND ACQUISITION OF SWIFT IN THE U.S.

In addition, the Du Pont analysis shows that in 2006 (the year before the IPO), JBS's ROE was 87%, with a profit margin of 3%, an asset turn of 1.37 and an equity multiplier of 18.9. The high leverage no doubt reflected the fact that the company was loading up on debt with help from the Brazilian Development Bank since 2005 to pay for its acquisitions and to prepare for its IPO. The total equity of JBS was 183 mil real in 2006. Immediately after the 2007 IPO, its equity increased to slightly more than 3 bil. real which dramatically decreased JBS's leverage ratio in 2007. By 2012, the ROE of JBS stood at 4%. Its profit margin had declined to 1% (up from -1% in 2011). On the other hand, the company's asset turn was 1.5 (up from 1.3 in 2011) and its leverage ratio was 2.32 (which was 2.2 in 2011).

Notwithstanding JBS's relatively poor stock performance and profit margins, the status of JBS as a diversified global protein producer did allow the company to navigate the real market in ways few others could. In 2008, for instance, when the European Union restricted sales of Brazilian meat alleging that breeders weren't complying with the EU traceability measures, JBS took advantage of its Australian subsidiary to export to Europe until Brazilian beef exports to the EU resumed in 2009. Similarly, although no Brazilian meat producer could export to the U.S.

because of restrictive U.S. safety rules, JBS was able to enter the market through its own U.S. subsidiary. Also, the production of three different proteins (beef, pork and chicken) allowed JBS to hedge against changes in market tastes (Blankfeld, 2011).

During the previous few years, with its resource-based horizontal acquisition strategy, JBS has reached an impressive market position in the world. Specifically, in 2010 (JBS, 2010) JBS became:

- the world's leading beef producer and exporter, with operations in the U.S., Brazil, Australia, Argentina, Uruguay, and Paraguay, and a daily slaughtering capacity of over 86,000 heads of cattle.
- the world's second largest poultry producer (behind Tyson), with operations in the United States, Mexico, and Puerto Rico and a daily slaughtering capacity of approximately 7.9 million birds (Tyson, 2011).
- the third largest pork producer in the United States, with a daily slaughtering capacity of 50,000 hogs.
- the world's leading lamb producer and exporter, with operations in the U.S. and Australia and a daily slaughtering capacity of 24,000 sheep.
- the global leader in leather tanning, with operations in Brazil, the U.S., Australia, Argentina, Uruguay, Paraguay, and China and a daily production capacity of 82,300 pieces of hide.
- the third largest dairy producer in Brazil, with a daily production capacity of 5,400 tons.

GOVERNMENT FINANCING OF JBS GROWTH

In 2004, the Brazilian government promulgated the Policy of Productive Development, with the purpose of developing specific sectors of the Brazilian economy. One of the chosen sectors was the meat sector, which was targeted to become the world leader in meat exports. With the support of the Brazilian government and financing from the Brazilian Development Bank (BNDES), there were major consolidations in the meat sector engineered by some key players. As a result of the successful policy, Brazil has become the world's leading exporter of animal protein (specifically, the number one exporter in the world of beef and poultry, and the fourth largest exporter of pork). Meat is currently the second largest agribusiness export sector in Brazil (second only to soybeans)(MDICE, 2012; Marques, 2010; Carvalho and Duysters, 2010).

The management of JBS took full advantage of the support from the government and used the resources offered by the Brazilian Development Bank to finance its key acquisitions. In 2005, the first international acquisition of JBS of Swift Armour in Argentina was financed by BNDES. The acquisition in 2007 of Swift in the U.S. was financed by a capital increase in which BNDES subscribed a portion of the new common shares. And the acquisition in 2009 of Pilgrim's Pride was again financed by issuing convertible debentures that were primarily subscribed by BNDES.

The original agreement to convert the debentures into sponsored Brazilian Depositary Receipts backed by the proposed U.S. shares in JBS listed in the NYSE or NASDAQ was renegotiated with the debenture holders, and the debentures were converted in May 2011 into regular JBS shares listed in the Brazilian Stock Exchange. With the conversion, BNDES increased its participation in JBS, from 25% to 31.41% shares (Figure 3) (Landim and Inhesta, 2011; Gradilone, 2011; JBS, 2011d).

JBS Shareholders	Before Conversion	After Conversion <small>April 2012</small>
BNDES	25,00%	31,41%
* Holding controlled by the Batista Family		
Sources: Landim, and Inhesta, 2011; Gradilone, 2011; JBS, 2012d		

**FIGURE 3: JBS SHAREHOLDERS BEFORE AND AFTER THE
CONVERSION OF THE DEBENTURES IN MAY 2011**

In fact, the heavy financing of JBS growth by BNDES generated some discontent from other meat packers in Brazil, who considered it unfair competition, and among cattle breeders, who were concerned that the concentration into a small number of meat packers would lead to price fixing of cattle. There were also critics of the interference of the state into businesses like JBS, which they termed *state capitalism* (Moreira, 2012). In response to these criticisms, an investigation was undertaken by Federal Public Persecutors in Brazil into the relationship between JBS and BNDES (Rodrigues, 2011). This investigation was closed, however, because BNDES was found to be acting according to the Policy of Productive Development, promulgated by the Brazilian government (Agência Estado, 2011).

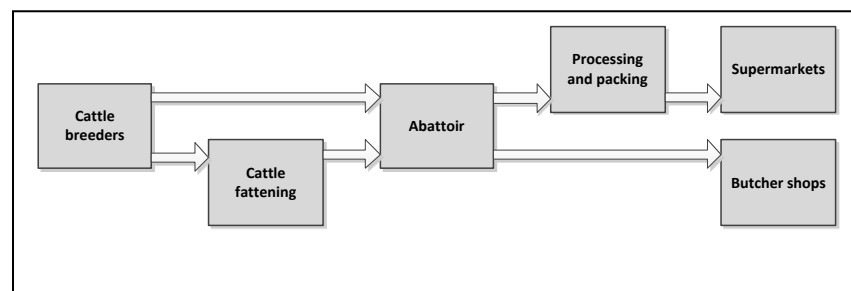
THE DYNAMIC FORCES OF CHANGE

The meat packing industry is a mature industry in Brazil. Similar to much of the rest of the world, meat packers usually handle the entire process, from slaughtering the animals (mainly cattle, pork, sheep, and poultry) in specialized slaughterhouses, to the subsequent cutting, packaging, and distribution of the meat. The animals are generally bought by the meat packers

from independent breeders, although sometimes cattle intermediaries purchase the animal from the ranchers who are distant from the slaughterhouses, and transport them to the vicinity of the slaughterhouses. Because the cattle lose weight during transportation, these intermediaries sometimes fatten them up with special rations before reselling them to the slaughterhouses. The cut meat is then sold by the meatpacker to butcher shops and the packaged meat sold to supermarkets (Figure 4).

Traditionally, cattle slaughterhouses in Brazil were small local operations which bought animals from independent ranchers, slaughtered the animals, cut the meat, and sold the cut meat to the local butcher shops: this is how José Batista Sobrinho started in 1953 in a small town in Brazil. However, three dynamic forces have changed the Brazilian beef business.

The first force that changed the beef business was the squeezing out of small ranchers by larger rancher operations. The larger ranchers could move deeper into the interior of Brazil where land was abundant and breeding of thousands of heads of cattle was possible. This change created the need to transport cattle from the open ranges to the slaughterhouses and to fatten them again to gain weight before being slaughtered. These large-scale cattle breeders and the intermediaries that were in the cattle fattening business started to impose their prices on the local slaughterhouses.



**FIGURE 4: BRAZILIAN MEATPACKERS (BEEF)
SIMPLIFIED SUPPLY CHAIN**

The second force was the expansion of supermarket chains which needed quality packaged beef to sell to their customers. These supermarket chains squeezed the traditional local butchers who had been the main clients of the local slaughterhouses out of business. In addition, the volume that these supermarket chains purchased and their quality requirements imposed changes to the traditional slaughterhouses: who had to aggregate meatpacking and implement a substantial number of sanitary and quality procedures. This increased cost to the slaughterhouses was not compensated by the lower prices per unit that the supermarket chains were willing to pay based on their high volume (and hence bargaining power).

Squeezed between the large-scale ranchers and intermediaries on one side and the supermarket chains on the other side, and with the higher cost of operations, local slaughterhouses began to find themselves in financial difficulties. Taking advantage of the situation, JBS, along with some other more effectively managed meatpackers, began to consolidate the industry by buying out those in trouble. The basis for these horizontal acquisitions was a strategy to increase the capacity to slaughter cattle, in order to be able to build up a better bargaining position against the big ranchers and the cattle fattening intermediaries (on the supply side), as well as the supermarket chains (on the demand side). This is the reason that JBS (up until 2009) measured growth by the growth of its cattle slaughtering capacity.

The third force that changed the beef business was the growing international demand for beef. Brazil, with one of the largest untapped agricultural land reserves in the world, was ideally suited to fill this demand. Given this, the Brazilian government targeted meat export as one of the priorities in their Policy of Productive Development in 2004. To access to the international beef market, Brazil had to improve the entire beef supply chain: including genetics, feeding, sanitation, processing, packaging, and transportation. This necessitated major investment by the Brazilian Development Bank in some key players (those that had the necessary scale and capacity already to make changes to the supply chain to open the international markets for Brazilian beef). Apparently, the most successful of these players was JBS.

THE ACQUISITION STRATEGY OF JBS

As noted above, José Batista Sobrinho learned the business from the supply side in the 1950s by purchasing cattle to resell to slaughterhouses. In 1953, he learned to operate a small butcher shop and a slaughterhouse, which he ran with his two brothers. The success of this venture motivated him to purchase two other slaughterhouses in 1968 and 1970, respectively.

Sobrinho soon realized that he needed to increase his cattle slaughtering capacity to gain bargaining strength against the cattle breeders and the intermediaries who were fattening cattle to sell to slaughterhouses. He also realized that he needed to create a branded packaged beef to differentiate the beef he sold to supermarkets and to avoid commoditization. To achieve this he renamed the company Friboi, and encouraged consumers to look for Friboi packaged beef in the supermarkets.

Sobrinho and his sons instinctively followed a resource-based competitive strategy to grow JBS (Figure 5). The key resource they used to build JBS was their slaughterhouses and the daily slaughtering capacity of cattle which enabled them to gain bargaining power against suppliers. The capabilities they built up were the efficient operation of slaughterhouses, cost efficient processing and packaging beef, and the capability to market branded packaged beef to supermarkets to gain bargaining power against consumers.

The acquisition strategy of JBS was essentially a resource-based horizontal acquisition strategy up until the acquisition of Swift in the U.S. in 2007, the subsequent merger with Bertin in Brazil in 2009, and the acquisition of Pilgrim's Pride (also in the U.S.) in 2009. The focus of the resource-based horizontal acquisition strategy was on acquiring beef slaughterhouses and packing plants to grow the cattle slaughtering capacity.

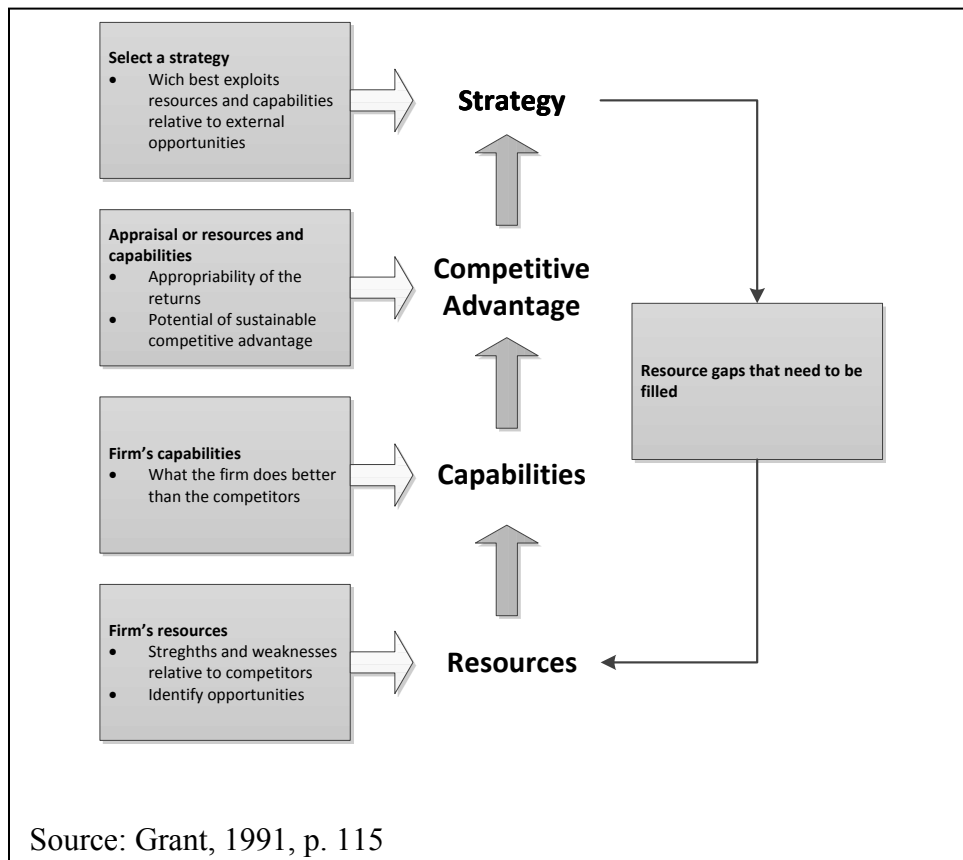


FIGURE 5: RESOURCE-BASED COMPETITIVE STRATEGY

The acquisition of Swift in the U.S. in 2007 (with its slaughterhouses in the U.S. and Australia) was also motivated by the need to establish operations in regions outside Latin America in order to deal more efficiently with currency fluctuations, sanitary restrictions, and other trade barriers. The issues were resource gaps that had to be filled for JBS to be a relevant actor in the world beef trade.

On the other hand, the acquisition also included a concentric diversification into pork and lamb (Figure 6). This acquisition made JBS the third largest pork producer in the U.S. and with additional smaller acquisitions in Australia, it became the world's leading lamb producer. When JBS acquired Smithfield Beef in the U.S. in 2008, the company consolidated its leadership as a

beef producer. Together with the beef operations, JBS also acquired the largest cattle feeder in the U.S., which was a major backward vertical diversification of JBS in the U.S.

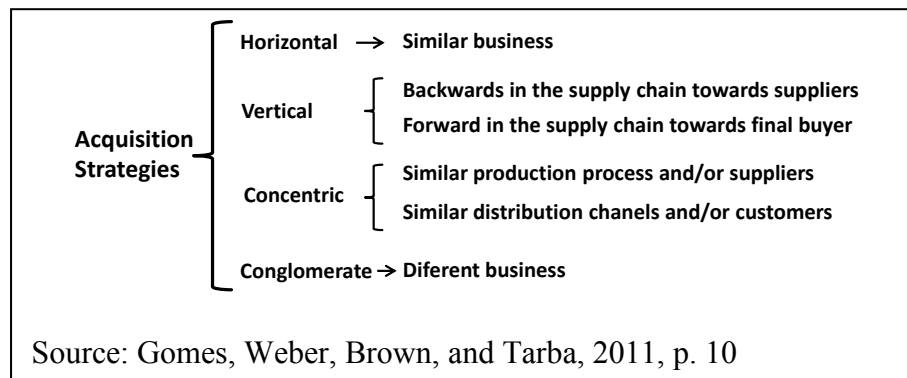


FIGURE 6: FOUR BASIC ACQUISITION STRATEGIES

The merger with Bertin in Brazil in 2009 also included an element of concentric diversification into leather. The merger consolidated the diversification that was started by JBS with the creation of JBS Couro [leather]. With the merger, JBS became a global leader in leather tanning. In addition, the merger included some conglomerate type of diversification into dairy products as well as canned vegetables, such that JBS is currently the third largest dairy producer in Brazil.

The acquisition of Pilgrim's Pride in the US in 2009 was another example of concentric diversification into poultry. With this acquisition JBS became the world's second largest poultry producer behind another U.S. firm, Tyson (Tyson, 2011).

In June 2013, JBS announced the \$2.7 bil. purchase of its Brazilian rival Marfrig's pork and poultry operations in Brazil, and Marfrig's leather operations in Uruguay. This acquisition is projected to increase the company's global revenue to \$46 bil. and JBS will become the largest poultry company in the world, in addition to beef.

Similar to most large companies, JBS also made some smaller vertical and concentric diversifications through the years, which potentially occupy management time and efforts that could be better deployed by concentrating on the core business. JBS today manufactures cans, produces collagen, casings, beef jerky's, energy, biodiesel, oleo-chemicals, has a trading company, a shipping company, a cattle confinement operation, and an agricultural supply and service company (JBS, 2012c).

CONCLUSION

JBS was very successful in the beef packing business, with its resource-based horizontal acquisition strategy that used the financial backing of the Brazilian Development Bank (BNDES) to acquire slaughterhouses and beef packing plants in Brazil, Argentina, Uruguay, and Paraguay. When JBS realized that its Latin America export platform was vulnerable to currency fluctuations, sanitary restrictions, and other trade barriers, it used the financial backing of BNDES to acquire Swift in the U.S. during 2007. In 2008, it acquired Smithfield Beef in the U.S. and the Tasman Group in Australia in 2008. In 2009, it kept up the pace with the merger of Bertin in Brazil and the acquisition of Pilgrim's Pride. These acquisitions diversified JBS into pork, lamb, and poultry, among other less synergic businesses.

The simple resource-based horizontal acquisition strategy in the beef industry that promoted JBS success was fuzzed by the need to learn to operate with pork, lamb, and poultry in foreign countries without home-grown experience such as those JBS had acquired in beef. In some acquisitions, JBS also diversified into new non-meat businesses (such as dairy products, which came with the Bertin merger). All this was complicated by the many locations all over the world. Beginning in 2007, this enormous task of consolidation had apparently strained the management resources of the company. It is no wonder that JBS had consolidation pains and that the firm's financial performance has deteriorated.

Probably the only way for JBS to return to its past strong performance achieved prior to the international acquisitions is to concentrate on its core business and shed most of the unrelated businesses that are distracting the management team. The concentration on JBS core business would also realign the firm with the objectives of the Brazilian Government's Policy of Productive Development. Recently, it seems that JBS management is starting to do this by spinning off its dairy product division (JBS, 2012c).

APPENDIX 1: DEVELOPMENTS TIMELINE OF JBS (1953 to 2010)

1953: *The beginning*

- José Batista Sobrinho commenced operations with a small butcher shop and slaughterhouse in the city of Anápolis (GO), with the capacity to slaughter five head of cattle per day.

1968: *The first acquisition*

- Acquisition of the first slaughterhouse in Planaltina (DF)

1970: *Growth was just beginning*

- With the acquisition of the second slaughterhouse in Luziânia (GO), slaughter capacity jumped to 500 head of cattle per day.

1981–2004: *Ongoing expansion through acquisitions and increase in productivity*

- Significant expansion of operations in Brazil through acquisitions of beef packing plants and units for raw and processed beef production, as well as investments in increased productive capacity.
- During this period, slaughter capacity reached 5,800 head of cattle per day.

2004: *This year featured additional acquisitions*

- Acquired 50% of BF Alimentos.

2005: *Creation of JBS SA and start of the process of internationalization*

- Restructuring of the Friboi Group into JBS S.A. as a public company.
- Initiated a period of internationalization with the acquisition of Swift Armour, the largest producer and exporter of beef in Argentina financed by the Brazilian Development Bank (BNDES).

2006: *Expansion in Argentina and increase of capacity for slaughter*

- Acquisition of two more units in Argentina (Venado Tuerto and Pontevedra).
- Continuing increase of capacity, reaching capacity to slaughter 20,600 head of cattle per day in a total of twenty-one plants in Brazil and five in Argentina.

2007: *IPO of JBS S.A. and entry into the U.S. market*

- JBS was the first meat processing company to make an IPO on the Brazilian securities exchange.
- Acquisition of two units in Argentina (Berazategui and Colonia Caroya).
- Acquisition of the food distributor SB Holdings.
- Acquisition of another unit in Brazil, in Maringá (PR).
- Capital increase: the Brazilian Development Bank (BNDES) subscribed a portion of the new common shares.
- Acquisition of Swift in the U.S., and changed its name to JBS USA.

- Major national and international acquisitions of beef packing and industrial plants in the beef by-product segment and packaging for JBS products.
- Acquisition of 50% of Inalca in December, one of the largest beef producers in Europe.
- JBS increased its slaughter capacity to 51,400 heads of cattle a day.

2008: *JBS expands its business abroad and consolidates its leadership in the beef industry*

- Announcement of the purchase of the American company Smithfield Beef and the Australian company Tasman Group, thus consolidating JBS leadership in the world beef industry.
- These acquisitions represented the conclusion of the investment plan for the construction of a sustainable platform for slaughter, production, and commercialization of beef in the U.S. and Australia, which began in July of 2007 with the acquisition of Swift in the U.S.
- JBS increased its slaughter capacity to 65,700 heads of cattle a day.

2009: *The incorporation of a Brazilian giant marks a year of success and growth*

- Merger with Bertin S.A., the second largest beef company in Brazil.
- JBS S.A. announced the expansion of the company in Brazil, incorporating five beef packing plants and an increase in the number of cattle slaughtered per day.
- Founding of JBS Couros (leather), which represents the company's entry into the field of industrialization, sale, importing and exporting of leather.
- Acquisition of 64% of the shares of Pilgrim's Pride Corporation, engaged in the breeding, slaughter, processing and sale of chicken.
- Announcement of the acquisition of Tatiara Meat Company (TMC), through its wholly owned subsidiary, Swift Australia. TMC is a processor of high quality beef located in Bordertown South Australia. The completion of the acquisition occurred in February of 2010.
- JBS increased its slaughter capacity to 92,290 heads of cattle a day.

2010: *Consolidation and integration of Pilgrim's Pride and Bertin*

- Consolidation of JBS USA, with the integration of Pilgrim's Pride, and of JBS Mercosul, with the incorporation of Bertin.
- Sale of its 50% participation in Inalca and the acquisition of the control of Rigamonti.
- Postponed the deadline for JBS USA IPO until December 31, 2011 by paying a premium on the debentures expecting that the U.S. stock market will improve in the future.
- JBS closed some inefficient slaughterhouses and the slaughter capacity was reduced from 92,290 heads of cattle a day in 2009 to 86,000.

Sources: JBS website and annual reports (Moreira, 2012; JBS, 2007a, 2008, 2009, 2010)

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“VISUAL LISTENING” – AN EXPLORATION OF CRITICAL THINKING AND HOW STUDENTS LISTEN WITH THEIR EYES

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ABSTRACT

In today's world of text messaging and emails, we found that students learn visually as well as aurally. In other words, students are learning from “visual listening” – listening related to reading texts, emails, and tweets. This exploration is a by-product of our earlier investigation of active productive listening as a key element in the process of thinking critically. Students stated, in interactive workshops, that in order for them to listen critically, professors must add visuals to their class presentations, have in depth knowledge of the subject matter, and explain to students why the material in the course is necessary in their “real” day to day lives. Students' perceived need for practical information far exceeded their requirement for abstract knowledge for the future and superseded knowledge that was purely theoretical in nature. Students do not listen unconditionally. This paper explores student learning – listening and “visual listening” in order to think critically.

INTRODUCTION

Throughout history, societies had various needs and expectations of what the future would hold. Hence, they also had a variety of views on how to educate their youth so that the future society they envisioned could flourish. In western civilization, the history of educational ideas is very long; it goes back at least as far as Socrates. Ever since those ancient times, many educational ideas were put on a pedestal as solutions to existing and/or perceived problems, only to be replaced by new solutions and new perceived problems, which came into fashion at the time. Sometimes “new” ideas were really old ideas that had been forgotten, or they were old ideas whose time had come. Critical thinking is just such an idea.

The concept of critical thinking in the United States became prominent in the second half of the 20th century, although the concept in fact had a much longer history. For instance, the words, critical thinking, were used by Sir Francis Bacon (1561-1626) in the early 17th century. Bacon wrote: “Critical thinking is a desire to seek, patience to doubt, fondness to meditate, slowness to

assert, readiness to consider, carefulness to dispose and set in order, and hatred for every kind of imposture” (Goralski & Gorniak-Kocikowska, 2012, p. 102). These words of Bacon serve as the motto of The Critical Thinking Community, which is a part of The National Council for Excellence in Critical Thinking. But, even the words of Sir Francis Bacon already had a predecessor in the famous Socratic Method which was, in fact, a method of teaching through practicing critical thinking (Fabio, n.d.).

Given the recent prominence of critical thinking in college curricula, as well as in discussions among faculty; and given the fact that we are both dedicated teachers, it was only natural for us to decide that this problem, i.e., critical thinking and its place in the process of education required our close attention. Thus, several years ago we initiated our own inquiry into some aspects of the critical thinking pedagogy. Recently, we focused on one of the most urgent and at the same time severely “underrated” issues, i.e., the problem of listening, or not listening, in the critical thinking process. We have continued our exploration of this subject. In this paper, we evolve into a new area – the role of “visual listening” in the educational process of critical thinking.

Our interest in the role of listening as a component of critical thinking pedagogy brought results in the form of several presentations and publications. For instance, in June 2011, we presented the topic of active productive listening at Fairfield University’s *Learning in Action: Innovative Pedagogy & Course Redesign XI* conference. Academics in attendance were extremely interested in this topic of listening – not as a passive part of conversation – but rather as an active and productive part of conversation – as active and productive a part as speaking, which they had not previously considered.

Our research continued and became a workshop that we presented, among others, in November of 2011 at Southern Connecticut State University (SCSU), entitled *Listening as a Precondition to Critical Thinking*. Some of the student information presented in the abstract of this paper was excerpted from that workshop – students advised that professors should add visuals to their class presentations, have in depth knowledge of the subject matter, and explain the necessity of the information in a student’s day to day life; otherwise, students will not listen. Our research continued with a gathering of information from students in strategy courses at Quinnipiac University and philosophy and women’s entrepreneurial courses at Southern Connecticut State University.

In summer 2012, we published an article entitled *The Role of Active Productive Listening in Communication, Pedagogy, and Thinking Critically* in the Journal of Business Management and Change. In that paper, we discussed the significance of the report that was commissioned by the U.S. Secretary of Education in 1981, the Honorable T. H. Bell, to study excellence in education. Bell’s initiative was based on complaints from both military and business leaders. It was determined at the time that students entering the worlds of the military and business could not think critically – they were unable to take knowledge from one field and apply it critically or

creatively in another. Consequently, critical thinking was declared to be a crucial component of college education. Reading, writing, and speaking became of utmost importance in curriculum, but the key issue of listening was not included in the report or in subsequent educational reform.

The National Commission on Excellence in Education was created on 26 August 1981 with a charter that included among other priorities “assessing the quality of teaching and learning in U.S. colleges and universities; comparing U.S. colleges and universities with those of other advanced nations, and defining problems which must be faced and overcome if the U.S. was to successfully pursue the course of excellence in education” (Gardner, D. P., 1983, Introduction, para. 3). The final report entitled *A Nation at Risk: The Imperative for Educational Reform* was released in 1983. Selected excerpts from the conclusion of that report follow:

If an unfriendly foreign power had attempted to impose on America the mediocre educational performance that exists today, we might well have viewed it as an act of war. As it stands, we have allowed this to happen to ourselves.... We have dismantled essential support systems which helped make ... gains possible. We have, in effect, been committing an act of unthinking, unilateral educational disarmament.... For our country to function, citizens must be able to reach some common understandings on complex issues, often on short notice and on the basis of conflicting or incomplete evidence. (Gardner, D. P., 1983, *The Risk*, para. 4)

The Commission issued a call to all who care about America and its future by concluding emphatically – America is at risk.

One of the most important tasks undertaken after the publication of *A Nation at Risk: The Imperative for Educational Reform* was to teach students how to think critically. However now, almost thirty years after the writing of *A Nation at Risk...*, academics are questioning whether critical thinking can indeed be taught successfully and whether students are listening and absorbing enough information to transfer the process of thinking critically from one subject to another (Willingham, 2007).

SILOS OF KNOWLEDGE – THE KANTIAN MODEL OF EDUCATION

Some of the questions that had to be answered for the Commission included the following:

- How useful for the task articulated in *A Nation at Risk...* were the old theories of critical thinking?
- How could academia implement critical thinking into the educational process?
- Could this implementation be applied as a foundation for a new model?
- And/or, would it be necessary to modify the old theories drastically or even create an entirely new theory of critical thinking into education?

These are also questions which are still of utmost importance today.

One of the most successful models of the modern university was created by Immanuel Kant (1724-1804) in the 1700s to meet the interdependent requirements of a new industrial economy and emerging nation-states (Taylor, 2010). This new model was broken down into four silos in two divisions – higher and lower faculties. The higher faculties included theology, medicine, and religion and the lower faculty, philosophy. Ultimately even though philosophy was considered a lower faculty, it was designed to dictate and pass judgment on the ethics of the other three high faculties. In this, the Kantian model was still following to a certain degree the model of the medieval university which dominated European education for centuries. As a matter of fact, Kant himself received his formal education in a manner still strongly influenced by the medieval model. It took him decades to make a break-through both in revolutionizing philosophy with his three monumental *Critiques* and in revolutionizing the model of education.

In this latter endeavor, Kant was following the tendency in science of his time to create clear boundaries between disciplines as well as his own desire to ‘categorize’ knowledge. He decided that higher knowledge must be carved into different divisions and departments – the egoistic self-contained silos that still exist in academia today. His model was initially implemented in Berlin at Humboldt University and then transported to the United States in 1876 to John Hopkins University (Taylor, 2010), where it became familiar to John Dewey (1859-1952), one of the most prominent theoreticians and reformers of education in the United States and worldwide.

If one looks deeply at the Kantian model, one can perhaps glimpse why students today cannot easily transfer critical knowledge from one subject area to another as professors in the same university oftentimes do not know what information or tidbits of knowledge are being disseminated by other professors from the same university, albeit in other silos, through either written or oral presentation.

The only area of study that appears to have surmounted the challenges of the Kantian silo is cognitive science, where one can glimpse the great benefit that the research of evolutionary psychologists, linguists, neuroscientists, and philosophers, to name but a few, bring to the complex study of the brain and its intricate complexity.

According to Friedenberg and Silverman (2006), authors of *Cognitive Science – An Introduction to the Study of Mind*,

Cognitive science can be roughly summed up as the scientific interdisciplinary study of the mind.... The term ... refers not to the sum of the disciplines, but to their intersection and converging work on specific problems, the glue that holds them together is the topic of the mind and, for the most part, the use of scientific methods. (p. 2)

In light of the above, there is little wonder that the most successful and most advanced knowledge-based technologies like bio-nanotechnologies and other emerging brain based engineered and cultivated technologies are oftentimes called “converging” technologies. They broke free from the confines of “knowledge silos” into interdisciplinary study of the human mind and of the world, as was clearly demonstrated, for instance, at the *Bioethics Conference: The Moral Brain* (which we attended in March/April 2012, in New York), under the joint sponsorship of The NYU Center for Bioethics, the Duke Kenan Institute for Ethics, the Yale Interdisciplinary Center for Bioethics, and the Institute for Ethics & Emerging Technologies.

No one field of study would be adequate to comprehend this elaborate interrelated and interconnected part of the whole, no one field of study would be adequate on its own – in its own silo. “Without this integration, each field would have only its own unique portion of knowledge, other knowledge would be lost and the combined energy and enthusiasm of cognitive science, would lose some of its drive” (Goralski, 2008, p. 97).

The Kantian model was created to provide nation-states with educated bureaucrats and researchers who would create new knowledge for the future. However, in today’s world, nation-states are breaking down as technology, communication, and the increasing power of transnational corporations have shifted economic power. Nation-states are still powerful, but the era of their domination is rapidly being diminished. Today we live in an almost borderless world where nation-states matter less and globalization is the new economic order (Dicken, 2007; Freeland, 2012).

New types of organizations – social, political and economic – require the re-configuration of institutions at every level of society. Boundaries – governmental, societal, and educational, once secure, have become permeable. Kant’s model of the university was created when the world was transitioning from an agricultural to an industrial economy. Consequently, there was an urgent need for a new model of education (especially higher education), which would satisfy the demands of the new economy and a new society. Moreover, the old university, the medieval university – even though it was officially still widely accepted as *the* form of an institution of higher learning and it was functioning universally – was dead as a place for creativity and new views long before Kant brought in his idea for the new one.

The medieval university’s slow death began with the introduction of printed books to the Western world. However, it is interesting to note that the connection between these two phenomena was not noticed for a long time – at least not in the United States. In Europe, it was seen earlier, although the full significance of it seems to have eluded even European scholars (Drucker, 1979). In today’s learning environment and due to the demands of today’s economy and other areas of public and private spheres, students and teachers must move past the university dictates of the 17th century and Kant’s desire to categorize knowledge. To do so, they must possess a will to listen – a will to think – a will to discover and evolve. As described earlier, in the United States, the awareness of this necessity became acute in the early 1980s, and

resulted, among other things with the publication of *The Nation at Risk...* with an emphasis on the role of critical thinking in the process of a fruitful, socially useful higher education.

THE WILL TO THINK – THE WILL TO LISTEN

Thinking – and especially critical thinking – when taking place as a part of the communication process, is closely connected with listening. One can say that listening is an unalienable part of communicative critical thinking, i.e., of that kind of thinking which – according to the present standards – dominates, or should dominate the educational process. This is an important pedagogical problem.

A student today is used to the fast pace of video games; text-messaging friends between or during conversations, and listening to his or her iPod at the same time. Students are walking, talking, listening, processing, analyzing, storing, and using all parts of their brain and body in multiple capacities in most life experiences, and then, they enter a classroom where a professor expects them to sit and listen to a lecture attentively, oftentimes, without a break. (Goralski, 2008, p. 96; Goralski & Gorniak-Kocikowska, 2012, p. 96)

And this is expected even though students usually have no training and no formal educational background in how to be active productive listeners. It is as important for schools to groom good listeners as well as speakers for leadership roles in the future (Cain, 2012). Reading, writing, and speaking, but not listening, are being taught at all levels of education, even though various studies have identified that more time in one's life is spent listening than speaking, reading, and/or writing (Campbell, 1997; Fiumara, 1990; Gardner, H., 1983; Johnson, 2012). Critical listening is not just a classroom issue either; Wolvin and Coakley (1988) argue that it is one of the important life skills, especially in our times.

Now, as never before, we are confronted by speakers who want to change our attitudes and our behavior.... Since freedom of speech ensures equal rights on both the honest and dishonest speaker, we must be effective critical listeners if we are to protect and control ourselves rather than allowing others to control us. (Wolvin & Coakley, 1988, p. 283)

Unfortunately, being constantly exposed to background noise in public spaces, people are developing an ability to suppress sound and not listen, rather than develop an ability to willfully listen and willfully think.

Throughout history there have been two main actors in the role of communication, both verbal and nonverbal – the speaker – and the listener. Even though listening oftentimes plays as active a role in communication as speaking, the direct impact of listening on the process of communication is limited as speakers rarely truly listen to the responses of listeners.

And yet, as evidenced by Karl Jaspers (1883-1969), German philosopher and psychiatrist, when the issue of listening, after World War II, became an obstacle in his own attempts at communication; if one will not listen attentively, willingly, and critically, then there is, in reality, no communication. Consequently, although listening was not originally the primary focus in the philosophy of Jaspers (1950), it became a subject of his investigation. One of the crucial points for him in this context became the question of the will to listen.

Jaspers linked the will to listen to the will to think as a necessary condition for the type of communication philosophers, himself included, had most interest in. It was also a necessary condition for what Jaspers considered to be philosophy. In his viewpoint, the will to listen, without which any meaningful communication is all but impossible, is also a will to think and to philosophize. The function of the will for listening is indeed very important, especially in the process of thinking critically – purposeful, rational thinking seldom takes place unnoticed or unwanted by the thinker. Just as in the case of listening, thinking and the will to think are closely intertwined.

Gemma Corradi Fiumara (1990) in *The Other Side of Language: A Philosophy of Listening* concludes that the neglect of listening is a philosophical problem, “a thinking primarily anchored to saying-without-listening” (p. 3). She believes that this is the result of the dominance of *logos* in western philosophy. *Logos* from the Greek ‘word’, ‘opinion’, and/or ‘speech’ – for Sophists – discourse – for Aristotle – reasoned discourse. “Exploring the term *logos* Heidegger repeatedly wonders: If such is the essence of speaking, then what is hearing?” (Heidegger cited in Fiumara, 1990, p. 6). Fiumara observes that in a *logos* dominated western intellectual tradition, domination and victory, rather than mutual understanding and insight, is the primary purpose of conversation. Sentences e.g., “I am telling you” or “listen to me,” are oftentimes meant to communicate listener obedience rather than to promote a will to think on the part of the listener. They establish the role of speaker as a dominant and active player, and listener as subservient or passive. Without the will to listen and the will to think logically, as established earlier by Jaspers, it is almost impossible to hold a meaningful conversation.

Don Campbell (1997), author of *The Mozart Effect*, makes a clear distinction between listening and hearing.

The difference between listening and hearing cannot be overemphasized. Compared to hearing, which is the ability to receive auditory information through the ears, skin, and bones, listening is the ability to filter, selectively focus on, remember, and respond to sounds. Listening is active, while hearing is passive. Often we hear, but we don’t listen. (Campbell, 1997, p. 44; Goralski & Gorniak-Kocikowska, 2012, p. 95)

In this sense, the listener can hold an active productive role in conversation if he or she is able to filter information, selectively focus and remember what is being said or store and selectively recall, and respond. This is an important distinction because the amount of attention devoted to

the research of speaking far surpasses the amount of research devoted to listening and yet, as mentioned earlier, we spend on average more time on listening than speaking. Research shows that in the course of a day “listening absorbs an average 55% of our daily communication time, speaking approximately 23%, reading 13%, and writing just 9%” (Campbell, 1997, p. 44).

Craig E. Johnson (2012), in *Meeting the Ethical Challenges of Leadership - Casting Light or Shadow*, states that group members do not have to carry as much of the conversation as in a one-on-one conversation, therefore, “If you belong to a team with 10 members, you can expect to devote approximately 10% of your time to talking and 90% to listening to what others have to say” (p. 292). And yet, in the formal sense of education, one is never purposefully taught how to listen.

According to Willard Spiegelman (2009), *Seven Pleasures - Essays on Ordinary Happiness*, when people listened to the radio in the 1920s through the 1960s, they became listeners rather than lookers. They “heard the human voice ... from a wooden box or a car radio [and] pricked up [their] ears and ... received sounds unaided by [their] eyes” (p. 132). He believes that people of his generation were born to become listeners – people who listen with their eyes closed – people who listen to the words, similarly to people who lived in oral civilizations, before the invention of writing.

Today, however, listening no longer holds the power that it once did - a power that held the listener engrossed in the act of listening and compelled one to focus his or her ears to willful listening and thinking. This is happening despite the fact that listening internalizes life and allows the content of what is being disseminated to become one’s own, and, is one of the main reasons why listening holds an important position in the ability to think critically. Active productive listening provides an opportunity for deep thought and inspiration for positive change.

A NETWORK-DRIVEN GLOBAL MODEL FOR EDUCATION

A new model of the university needs to be established to transition the world from the Kantian model to a network-driven global model. Networks of global education must produce a new type of knowledge that encourages free flows of cultural and intellectual capital between silos within universities and between universities and nation-states - interdisciplinary knowledge that encompasses the virtual knowledge that exists in the world. Higher education that was created in the 1700s is no longer functional. The organizational structure and operating principles which were found deficient in 1981 by U.S. Secretary of Education, T. H. Bell, are still dysfunctional. The Kantian model can no longer meet the needs of today’s complex world of information technology, social networks, global expansion, etc.

New information, media and, most important, net-working technologies are transforming global, social, political, and economic infrastructures in ways that are revolutionizing the production and transmission of information. These technologies are ... recasting the very structure of knowledge and the means of its dissemination. Lectures and seminars offered in today's colleges and universities are still similar in style and format to those delivered in classrooms in the 1700s. It is necessary to find other pedagogical strategies to promote the exchange of ideas that is vital to the educational process. (Taylor, 2010, p. 14)

Innovation is dynamic, driven by a continuous search for new knowledge, ideas and technology that will deliver value. This is the process of 'creative destruction' that is at the heart of the economic growth process, because new technologies lead to better performance and increased productivity as they displace old technologies. (Ministry of Science and Innovation, 2012, para. 1)

Today's universities also need to embrace innovation as dynamic and driven by a continuous search for new knowledge, ideas and technology that will deliver value to students. If we look at the interrelatedness of cognitive science, which was presented earlier in this paper, then we can see the benefit that the research of evolutionary psychologists, linguists, neuroscientists, and philosophers, bring to the complex study of the mind and brain. No one field of study would be adequate to comprehend the elaborate interrelated and interconnected parts of the whole. The idea of creative destruction, "incessantly destroying the old ..., [while] incessantly creating a new" (Schumpeter, 1942, p. 83) is one that we, as educators, should keep in mind. Students in the future will need to be flexible as their lives will be unceasingly evolving. Education will be their present and future endeavor and listening is at the core of that basis of knowledge obtained through the process of critical thinking, whether they become world leaders or followers.

The rapidly expanding knowledge of the working of the human brain supports the statements presented above. According to Daniel Pink (2006), author of *A Whole New Mind: Moving from Information Age to the Conceptual Age*,

The future belongs to a very different kind of person with a very different kind of mind – creators and empathizers, pattern recognizers, and meaning makers. These people – artists, inventors, designers, storytellers, caregivers, consolers, big picture thinkers – will now reap society's richest rewards and share its greatest joy. (p. 1)

Creators and empathizers, pattern recognizers, and big picture thinkers – these are the words of Pink (2006, p. 1). We would add active productive listening, thinking critically, and adding value to a whole new world of opportunities.

ILLUSTRATION, BLIPS, AND SOUND BITES

Another issue related to critical-thinking-in communication is listening with one's eyes – “visual listening.” This issue initially emerged with the invention of writing and it intensified tremendously with the invention of the printing press. Although textbooks were not unknown in medieval universities, they played a secondary role to lectures (requiring memorization of large amounts of information) and debates. A conversation was an event which took place face-to-face, contemporarily and involved mainly the physical activities of speaking and listening. Thanks to the invention of the movable type by Johannes Gutenberg, the accessibility of written texts grew rapidly and with them the concept of conversation changed (McLuhan, 1962). It became quite common among literate individuals to have a silent conversation with an author of the written text and - as Karl Jaspers, who was mentioned earlier in this paper, liked to phrase it - to communicate with the great minds across the ages.

One could “listen” to what these great minds had to say; but it was a different type of listening, a “visual listening.” The process of verbal communication was taking place, as well as a conversation, although the conversation was often somewhat one-sided. But even under these conditions a true dialogue could take place, provided that critical thinking was involved. Reading a text carefully and, if desired, multiple times, the reader who was a critical thinker could find answers to his/her questions or confirm his or her doubts about the value of the author's ideas. The reader “listened” to the author visually through the printed text and reacted to it by creating questions and commentaries in natural language; sometimes in the form of silent thoughts, sometimes in writing, sometimes spoken softly or loudly. Oftentimes, the text “spoke” back to the reader, if the reader “listened” carefully.

According to Umberto Eco (1989), *The Open Work*, people respond to their own patterning and supply their own credentials and sense of conditioning, which is particular to their own culture, set of tastes, personal inclinations, and prejudices. Thus, each person “listens” to the written word from his or her own perspective, making a work open to a multiplicity of meaning which he or she must hunt for and ultimately find on his or her own.

In the 17th century, the revolutionary pedagogical ideas of Johann Amos Comenius (Komensky) the author of – among others – the first illustrated textbook in Europe, brought attention to the power of visual aid in the educational process.

Umberto Eco wrote about the significance of “visual listening” in the life of the Italian philosopher, Benedetto Croce (1866-1952):

Art [or illustration] for Croce was a purely mental phenomenon that could be communicated directly from the mind of the artist to that of the reader, viewer, or listener.... The material medium of the artistic work was of no real significance; it merely

served as a stimulus to enable the reader to reproduce in him- or herself the artist's original intuition. (Eco, 1989, p. ix)

In our times, the problem of the role of illustrations or other visuals in education, and in the critical thinking pedagogy in particular, became acute on a fully new level with the introduction of computers and ICT (Information and Communication Technologies) generated by them. The senses are overwhelmed and bombarded on all fronts. The art of critical thinking and the experience of critical thinking as outlined by John Dewey (1916) - as a perfect example of aesthetic appreciation - has fallen by the wayside.

New pedagogical issues – blips and sound bites – Twitter and Facebook– text messaging and emails have brought a broader dimension to “visual listening.” Students state that they listen more with their eyes than with their ears, even though this discovery surprises them. Books, magazines, and almost everything, except our beloved academic journal articles, have taken on the appearance of blips and sound bites. Magazine articles are short and many articles are set upon the page. They are basically a mélange of trivia. Case in point: Bloomberg BusinessWeek is color coded so that, for instance, global economics students do not have to waste their time wading through the politics and policy, markets and finance, or technology sections of the magazine. They can easily know that the color blue signifies global economics and go directly to the articles of interest. However, is this not creating knowledge with blinders – knowledge of one field of study only without the chance that one might become enthralled by an article in one of the other sections of the magazine if he or she had the opportunity to peruse at his or her own leisure? This knowledge seems even more contained within a silo than Kant's model of the university and brings into question whether, in reality, one can have a true sense of global economics without reading any of these other sections. As a side point, the advertisements are also conveyed to students as articles with interesting titles like “The Defense Never Rests – As cybercrime becomes more rampant and its consequences more ominous, improved public-private collaboration is necessary to create effective countermeasures” (*Bloomberg BusinessWeek*, 2012, p. S1) or “The Quest for Hidden Treasures – Panasonic's recycling-oriented manufacturing approach is mapping out a new life for e-waste” (*Bloomberg BusinessWeek*, 2012, p. S1 – S4). Typically, student readers, perhaps readers in general, miss the small print at the top, SPECIAL ADVERTISING SECTION.

Tweets are confined to short bursts of conversation, otherwise, it is assumed that one would go on and on; hence trivial blips have gained in importance. Topics like what one ate for breakfast have become a reason to tweet someone – and consequently carry on a short conversation. One now has the capability to accept or reject a conversation. If one is not interested in what “the speaker” ate for breakfast then he/she can reject the tweet and simply “not listen.” However, is the breakfast knowledge already embedded in the “non-listener's” brain? Can one also reject the sight of or “listening” to a tweet? Is the mind no longer capable of reading more than one short paragraph or is the mind becoming so clogged with irrelevance that there is no room left for true conversation the same as public noise has prevented one from listening actively and productively? In Facebook, one can “like” or invite one into their page, and one can share

advertisements with a friend by “liking” them. Often students restrict their use of ICT to tweets and their Facebook contacts to people of their own generation; this leads to breaking the lines of inter-generational and inter-cultural communication.

With social media, the listener has the capability of allowing or disallowing a speaker into the conversation. The listener perhaps has gained in power. The power to accept a conversation or reject a conversation, but philosophically speaking it is not actually a conversation at all if only one member is active. Students and faculty members will state that he or she “spoke with a person,” however, when asked when he or she saw the person, the answer is that he or she didn’t actually see the person at all. He or she “heard” the person visually through social media.

"VISUAL LISTENING"

During the course of this body of research, we discovered that for students who send emails, tweet, post on Facebook, and are almost continuously on their smart phone texting; “visual listening” is the way in which they receive most of their information but often it is too selective. Students discuss “having a conversation” with someone, when in actuality he or she received a text message or email and there was no traditionally understood “conversation” involved.

Students are beginning to listen with their eyes more than with their ears, hence the title of this paper. But are people listening more with their eyes than they did with their ears or less? Is conversation more or less balanced on the parts of the speaker and/or the listener? Are students more capable of “listening” with their eyes? If they are, then has it impacted their ability to think critically?

IMPLICATIONS

The implications of this research for the future of pedagogy are great. Students are demanding more interactive classroom “conversations” – even though their capacity for active productive listening and true “listening” seems to be somewhat diminished. Classroom conversations and interactions between students are changing. When given a topic to discuss with colleagues in class, students oftentimes divide the work, each person works on his/her own part, and then text or email his or her portion of the conversation to a colleague, who will then combine the dialogue and submit the final assignment – even though these students are sitting right next to each other in the classroom – texting is silent. When asked why they text instead of converse, students conclude that this is a “better use of time” than perhaps getting caught up in a conversation and losing focus.

If an assignment is given to five people, and one handout is dispensed so that the five students will have to read and discuss it together, then one student will photograph the handout with his or her smart phone and email it to the other students in the group so they can each have their own handout. This is another form of silent conversation.

PowerPoint slides have been deemed too slow by students and Prezi (cloud-based, collaborative, free software) is taking its place. Students can work together online, information is stored in the “cloud,” and students can visually watch each other work via the Prezi site. This is a new form of collaboration. This option is also available in the form of a Business Simulation Game (BSG). Previously, the BSG demanded an in-person discussion between colleagues and co-managers of the simulated company, now co-managers on a team can interact silently within the simulation software.

With the college classroom changing in such a rapid way the question remains open whether, and if so, how these new phenomena will impact the critical thinking pedagogy. Another question is how these phenomena should impact the critical thinking pedagogy.

RECOMMENDATIONS

We think that all university students, as well as all faculty members, would benefit from listening intensive (Listening Across the Curriculum – LAC) courses, as well as, or at least in the same way they are benefiting from writing intensive (Writing Across the Curriculum – WAC) courses in General Education. Unfortunately, in an era that puts pressure on universities to shrink the core requirements, this may not be a practical recommendation. This does not mean, however, that the issue should not be considered.

Having listening intensive (Listening in the Discipline – LID) courses, similar to writing intensive (Writing in the Discipline – WID) courses which already exist in the curricula of many universities and colleges, would probably cause general discontent since most professors in the majors balk at teaching writing intensive courses while trying to disseminate the specific material necessary for students to become proficient in their fields of study.

Therefore, this paper advocates introducing Active Productive Listening and “Visual Listening” Intensive Workshops into the educational requirements of First Year Experience (FYE) university students, as well as faculty members who are teaching FYE, in order to disseminate information and skills that both students and faculty members can use to become better listeners and critical thinkers – to enhance Western intellectual culture (or any culture for that matter) – whether by listening in person or “visually” listening in social media and other means of e-communications.

These workshops would stress the importance of active productive listening and "visual listening" in communication, pedagogy, and critical thinking. They would set the stage for a new type of learning – for a creative destruction of the Kantian “silo” model of production and dissemination of knowledge – and conception of a new network-driven global university model based on diversity, interdisciplinary research, and creative, critical thinking. An added practical value of enhancing the skills of active, productive critical listening, aural or visual, is the usefulness of these skills for a quick adaptation to the changing job market. The majority of today’s students will be life-long learners by either necessity or by choice. Many of them will have to re-train for new jobs several times during their productive years. The rapid development of new technologies will make obsolete at an even faster rate a great number of skills students learn presently, but it will also create the need for new skills which will have to be learned quickly. This, in turn, means the necessity to retain for a long time the critical thinking skills and therefore also the active, productive critical listening skills garnered in formal education.

CONCLUSION

Professors have to take their cue from students and the global social media connected economy. One can no longer remain embedded within the Kantian "silo" model of education, lecturing for the duration of the class time, within and for one discipline only. Students are used to blips and sound bites of knowledge. Perhaps social media has decreased the attention span of students, or maybe the attention span was never there but students were more adept at pretending to be interested because they wanted to “get the grade.” Students, as listeners, have the choice to “listen” or merely “hear” without absorption. Students as “visual listeners” have the choice to become involved or merely glimpse. Students are now used to this new power, which they have achieved through social media, to accept or reject what the speaker says.

Paradoxically, the very characteristics, which cause professors today so much frustration, namely, the “multi-tasking” and short attention span displayed by students in the classroom could be very useful in the process of breaking out of “Kant's silos.” If properly understood and managed, these characteristics could help students connect the bits of information from various disciplines into one concept, one vision, and one knowledge of the ever-changing networked global reality.

This paper has delved into previous research that we conducted on the importance of active productive listening as a key component to critical thinking. It has allowed us to go even deeper into our research to identify “visual listening” and the components of teaching to students who are used to the power bestowed on listeners in social media. Our findings have allowed us to more fully understand the importance of the missing link in critical thinking – the role of active productive listening and "visual listening" in the 21st century. However, it is clear to us now that what we have explored thus far is only the tip of the iceberg and that we are only at the very beginning of a long journey through the critical thinking pedagogy in the age of emerging and converging technologies and a global society shaped by networks and a global economy.

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