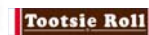


The Chicago Processed Food Cluster



The Microeconomics of Competitiveness

Professor Michael Porter

Harvard University

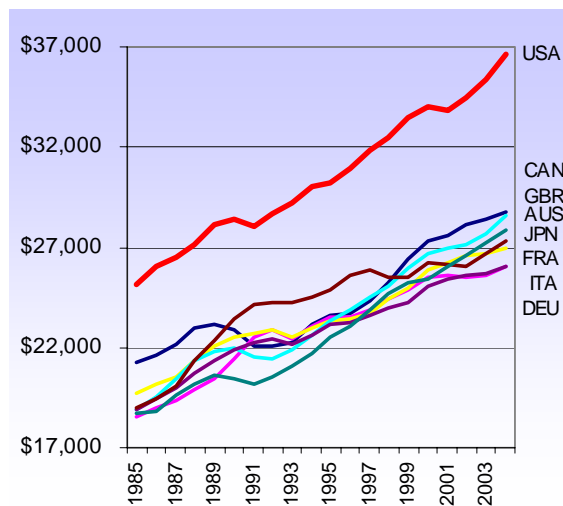
May 5th, 2006

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1. The United States and its competitive position

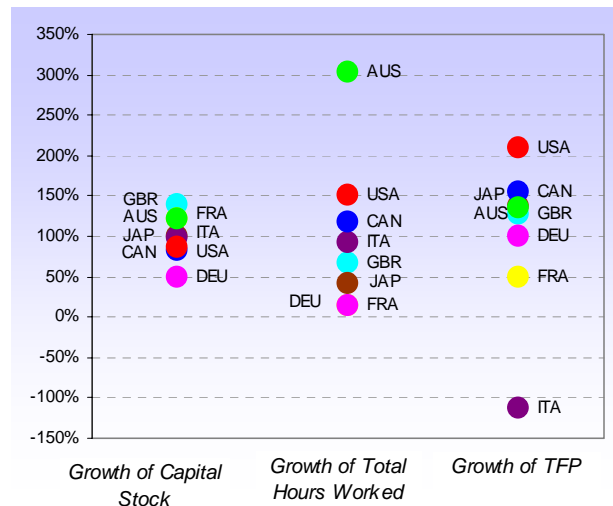
The US is the largest economy in the world.¹ In 2004, its Gross Domestic Product totaled \$10.76 billion; comparatively, European Monetary Union member states produced \$7.99 billion in the same period. Furthermore, the US is home to unparalleled domestic market demand. With a population of 294 million people America's income per person of \$36,465 in 2004 is second only to that of Luxembourg.² As shown in Figure 1, American prosperity has steadily grown in the past two decades and today remains higher than its G-8 counterparts, Canada, Great Britain, Japan, Australia, France, Italy and Germany.

Figure 1 – GDP per capita level
(Constant year 2000 dollars at PPP)



Source: World Development Indicators

Figure 2 – Growth of GDP determinants,
relative to G-8 average (average for 2000-2004)



Source: Authors' calculations on data from Economist Intelligence Unit and Groningen Growth & Development Center

America's gains in Total Factor Productivity (TFP) account for the nation's rapid and sustained growth. As evident in Figure 2, when compared to her G-8 counterparts, US growth in capital stock was lackluster, at 87% of the G-8 average in period 2000-2004.³ In terms of labor input, hours worked per capita were slightly higher (110% of G-8 average), but decreasing 40% faster than in the typical G-8

¹ Unless otherwise noted, data in this section comes from the World Bank, World Development Indicators. All GDP and GDP per capita figures expressed at Purchase Power Parity.

² Expressed in constant year 2000 international dollars (equivalent to \$39,676 at 2004 current international dollars), PPP. Luxembourg holds the first place in terms of GDP per capita: \$69,961 USD at 2004 current international dollars, PPP.

³ Rates referred to in the text we calculated as the average of the annual growth rates for each factor, over the period 2000-2004.

country.⁴ Thus, the country's strong growth relative to the G-8 is explained by its rising TFP, loosely interpreted as advances in technology and efficiency, which grew at a stunning 210% of the group's average rate over this period.

Regarding U.S. macroeconomics, some concern has been raised over the current account deficit, which was estimated at \$700 billion in 2005, after 25 years of deficits totaling \$5,000 billion. While this feature of US macroeconomic performance is frequently criticized, there is an active debate among economists as to its impact on competitiveness.⁵

US diamond conditions are generally excellent. However, as we can see in Figure 3, there is room for improvement in some areas. Several of these weaknesses impact the competitiveness of the Chicago processed food cluster. The nation suffers from relatively high trade barriers, particularly in the importation of agricultural products.⁶ Moreover, the United States has fewer scientists and engineers than expected for its level of development. The general quality of math and science education is also surprisingly low when compared to fellow G-8 members. These latter two issues are particularly worrisome for a country whose economic growth depends so heavily on TFP growth (i.e. innovation and efficiency) rather than factor accumulation.

⁴ "Hours worked per capita" is decreasing in every G-8 country.

⁵ Several economists, including Harvard's Ricardo Hausmann and Federico Sturzenegger (2005), argue that if local and foreign assets are measured according to the income they generate, the US external imbalance becomes relatively unsubstantial. Higgins, Klitgarrd, and Tille (2005) of the Federal Reserve Bank of New York, however, argue that in spite of the new accounting for America's foreign assets, "the continuing buildup of liabilities should soon push the US income balance below zero. In that event, net inflows will begin to boost the nation's current account deficit instead of reducing it." Summers (2006) also rejects the "commentaries of the complacent" and has raised concerns about the "unsustainable and problematic dependence of the United States on foreign capital."

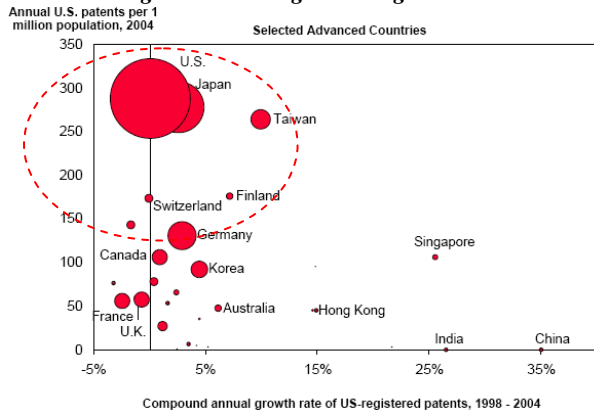
⁶ Although the average US import tariff hovers at approximately 5%, more than 150 products (HS codes) are assessed at 35% or more. Among these, 100 are agricultural products. Sugar, in particular, stands out among protected commodities. A GAO report (2000) estimated that high sugar import duties resulted in a \$1.9 billion subsidy to US sugar producers, primarily beet sugar producers in Midwestern States. Among international trade economists, it is widely held that "nowhere is there a larger gap between the U.S. government's free trade rhetoric and its protectionist practices than in the sugar program." (Goksenkus et al, 2003). For Chicago's once-strong confectionary industry, the relatively high cost of sugar in the US has resulted in relocations of at least 1000 candy manufacturing jobs to Canada or Mexico in the past five years.

Figure 3 – US Diamond Strengths and Weaknesses

	Strengths (Rank/166)	Weaknesses (Rank/166)
Demand Conditions	Buyer Sophistication: 1	Environmental Regulations: 18 Gov Procurement of Hi-Tech: 8 Demanding Reg. Standards: 5
Factor (Input) Conditions	Sci. Research Institutions: 1 University/Industry Collab: 1 VC Availability: 1 Fin. Market Sophistication: 2	Math and Science Ed: 39 Bureaucratic Red Tape: 33 Quality of Public Schools: 18 Availability of Sci and Engineers: 13
Context for Firm Strategy And Rivalry	Intensity of Local Competition: 1 Intellectual Property Protection: 1	Favoritism in Gov decisions: 32 Trade Barriers: 27 Labor-Employee Relations: 19 Foreign Ownership Restriction: 13
Related and Supporting Industries	Available Specialized Research and training services: 1	Local Avail. process machinery: 3 Local supply quality: 3 Local supplier quantity: 3

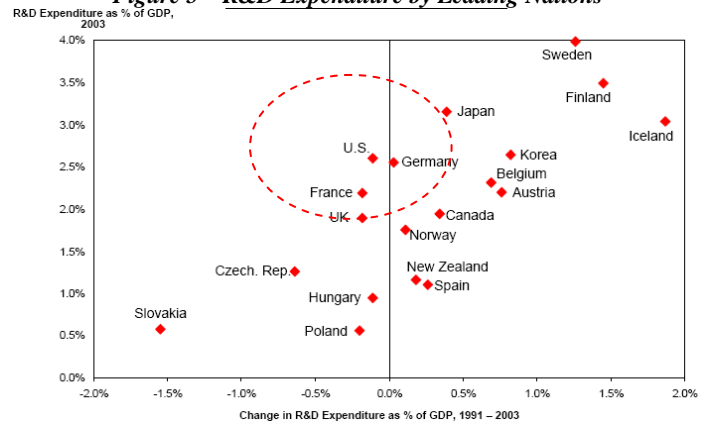
Source: Global Competitiveness Report 2005

Figure 4 – Leading Patenting Nations



Source: US Patent and Trademark Office, via MOC Notes

Figure 5 – R&D Expenditure by Leading Nations



Source: OCDE, via MOC Notes

As shown in Figures 4 and 5, even though the US is currently the world leader in “number of patents,” both in absolute terms and relative to its population, its R&D investment is decreasing as a percentage of GDP. Moreover, the share of Engineering and Science degrees (of all college degrees) is relatively low in the US, which suggests future shortages of critical technology skills in the coming decades and thus threatening US competitiveness. There are a number of countries, most notably Japan, which could conceivably surpass the US in innovation within the next few decades.

2. Chicago and Midwest Regional Competitiveness

Historically, the American Midwestern region was known as both the “Breadbasket” as well as the “Industrial Heartland” of America. More recently, the Midwest, and more broadly the region between New York and Chicago, has been called the “Rust Belt” following nearly four decades of industrial decline. Embodying some but not all of these characteristics is Chicago,⁷ the so-called “capital city of the Midwest.” Home to the nation’s third-largest Metropolitan Area population (8.5 million), Chicago’s economy is substantial, at \$350 billion, larger than either Taiwan’s or Switzerland’s.⁸

“Chicagoland” (as natives refer to the metropolitan area) is known for its diversified service and industrial economy relative to other “Rust Belt” cities. It is also renowned for its extensive road, rail, water, and air infrastructure, making it the nation’s largest transportation hub. The city’s financial industry, particularly the Chicago Board of Trade and the Chicago Mercantile Exchange, host the world’s most heavily-traded futures, derivatives and commodities market, earning Chicago the reputation of “the world’s risk manager.”⁹

Endowed with a host of “livability factors,” such as world-class universities, plentiful, cosmopolitan cultural and entertainment activities, vibrant downtown and distinctive architecture, Chicagoland is the 5th most-popular headquarters location for Fortune 500 companies; the state of Illinois is home to 62 Fortune 500 firms.¹⁰

In output level, the state of Illinois performs slightly above average (Figure 6) and is growing slower than the US average. Moreover, as we can see in Figure 7, the share of Chicago’s traditional clusters in US employment declined from 1990 to 2003, with no apparent emerging industry leaders.

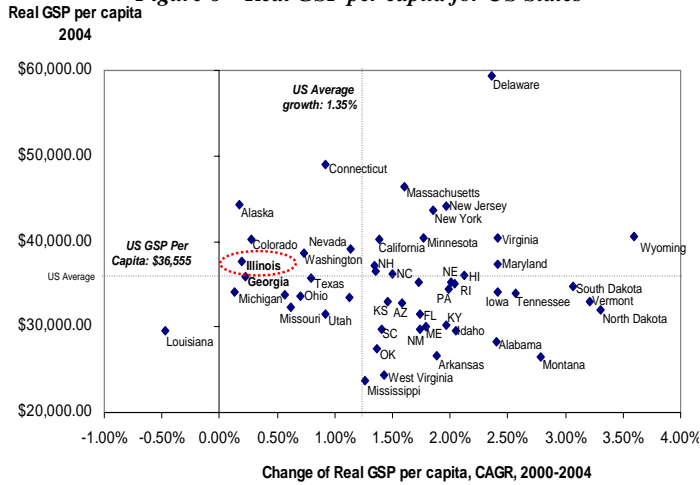
⁷ “Other cities still groping for life after manufacturing death and trying to restore hope to their citizens and to the benighted neighbourhoods in which they live would do well to see what they can learn from Chicago’s experience” (“Survey: Chicago, A Success Story,” *The Economist*, 16 March 2006.

⁸ Source: World Business Chicago, www.worldbusinesschicago.com.

⁹ “A Success Story,” *Economist*, 16 March 2006.

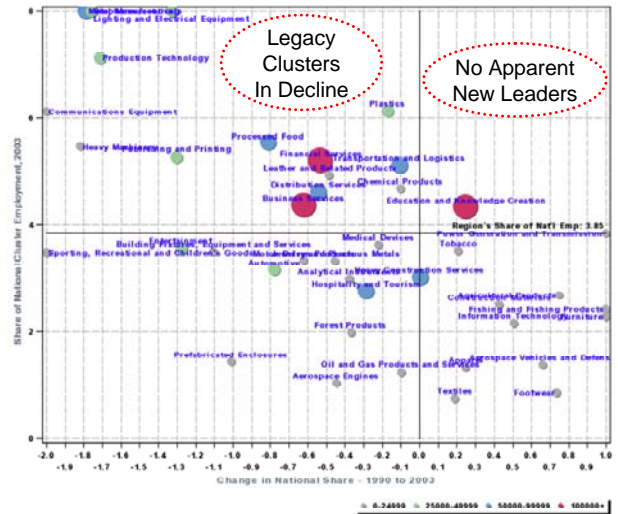
¹⁰ Fortune 500 firms located in the Chicagoland area include: State Farm Insurance (#22), Boeing (#26), Sears Holdings (#33), Walgreen (#45), Motorola (#54), Allstate Corporation (#58), Abbott Laboratories (#93), McDonalds Corporation (#109), Sara Lee (#111), United Airlines (#124), Exelon Energy (#144), Navistar International (#201), Aon (#237), Baxter (#240) and Smurfit Stone Container (#274).

Figure 6 – Real GSP per capita for US States



Source: Bureau of Economic Analysis, US Department of Commerce

Figure 7 – Chicago Clusters' Share in US Employment



Source: Cluster Mapping Project, ISC

Figure 8 – Illinois/Chicago Diamond Conditions

	Strengths	Weaknesses
Demand Conditions	<ul style="list-style-type: none"> 8.5 million population (Chicago Metro) Strong ethnic diversity and international linkages in Chicago 4th largest GSP in Country 	<ul style="list-style-type: none"> Population growth below average Tastes representative but not leading Limited international exposure beyond metropolitan area
Factor (Input) Conditions	<ul style="list-style-type: none"> Central location in US Most extensive transport infrastructure Large manufacturing workforce Education: >20,000 masters per year Diversified economic base 	<ul style="list-style-type: none"> Extremely cold winters (livability) Transition from Industrial Base Union legacy
Context for Firm Strategy And Rivalry	[same as national]	<ul style="list-style-type: none"> Favoritism in government decisions (may be worse than national average)
Related and Supporting Industries	<ul style="list-style-type: none"> Business services abundant World-class universities High Corporate and Gov. R&D Diverse industrial base 	

Illinois is average among US states in productivity, with value added per production worker of \$106.60 (National average, \$106.34). In terms of innovation, measured by patents, the state is slightly above average with 6.5 patents per 10,000 employees versus the national level of 7.3. Illinois' patent growth was 1.4% over 1994-2004, slower than the national average of 4.3%. Examining Chicago's diamond conditions (Figure 8), we find that although Chicago is located in the Rust Belt, its demand

conditions, legacy institutions, and diverse economic base set it aside from other cities in the region.

Demand Conditions. Chicago is one of the largest population centers in the nation, with 8.5 million people. Moreover, the state-wide economy is large (the fourth largest in the nation) and provides an enormous market for a wide range of goods. Also important is the composition of this population, which is more ethnically diverse than the general US population. While African Americans comprise just 12.3% of the US population, they make up 18.6% of the Chicago population, almost 50% higher. Likewise, the Asian American population is 3.6% nationwide and 4.2% in the Chicago area. Finally, Hispanics comprise 12.5% of the US population, but account for 16.4% of the Chicago metropolitan population (US Census Bureau). This diverse range of preferences and tastes makes Illinois a convenient “testing-grounds” for products catering to mass appeal.

Looking at weaknesses, two major issues emerge. First, population growth in the Chicago metropolitan area is below average, which implies that it is losing share in the US population. Consequently, companies that focus on local demand will see their share in US output drop, unless they increase their tradable product offerings.¹¹ Secondly, according to information obtained in interviews with food industry executives, Chicago tastes are regarded in the industry as representative, but not “leading.”¹² In other words, “if a product makes it in Chicago, it will make it in the US” but Chicago tastes are not indicative of emerging or niche trends.

Factor Conditions. Chicago’s central location is a strength that cannot be underestimated. Not only is it a national hub for transportation but Chicago is also a crossroads for telecommunications (the world’s largest single Internet exchange is in Chicago; Economist, 2006) and is the world’s third largest handler of inter-modal containers, after Hong Kong and Singapore.¹³

Chicago’s workforce is formidable at more than 3.9 million people. While a high percentage of

¹¹ Tradable products in the processed food cluster include sub-cluster products such as specialty foods and candy/confectionary items.

¹² Interviews with executives at several Chicago-area processed food companies were conducted for this study; conversations were conducted off-the-record and not for attribution.

¹³ World Business Chicago, www.worldbusinesschicago.com

the workers work in manufacturing (10.4%), the city's professional population is also significant, with more than 37% of workers engaged in financial, health, and professional and business services. Chicagoland hosts more than 70 colleges and universities, and more than 20,000 master's degrees are awarded in the area annually, providing the city's businesses with a steady stream of professional talent.

Finally, according to senior economist Rick Mattoon of the Chicago Federal Reserve, "the composition of Illinois' economy in 2003 almost exactly mirrored that of the country as a whole" (Economist 2006). This economic diversification has enabled the Chicagoland area to weather economic downturns and post-industrial economic restructuring better than neighbors Detroit, Cleveland, and St. Louis, all of which have economies heavily weighted in manufacturing.

Among weaknesses in Chicago's factor conditions is its reputation as a "union town." In reality, however, union influence has decreased as the manufacturing sector has declined. In fact, many of the most labor-intensive manufacturing jobs have been taken by non-English speaking, non-union workers.¹⁴

Context for Firm Strategy and Rivalry. Generally speaking, the context for firm strategy and rivalry is the same in Chicago/Illinois as it is on the national basis, because many of the institutions and laws that govern this factor derive from Federal policies. However, Chicago has a few noteworthy weaknesses. As noted in the Economist (2006), "[Mayor Daley] presides over an administration in which patronage clearly plays a large part," suggesting the possibility that lack of government transparency damages Chicago's competitiveness.

Related and Supporting Industries. Finally, one of Chicago's core strengths is the depth and breadth of its related and supporting industries. Business services are abundant, capital and risk management services are readily accessible, numerous universities are nearby, and transportation and logistics services are second-to-none. All of these factors, combined with a diverse industrial base,

¹⁴ Interviews with executives at several Chicago processed food companies. Hispanic/Latino workers now make up almost 40% of the 620,000 manufacturing jobs in Chicago yet fewer than 14% of these workers are members of unions (Arndorfer, 2001)

illustrate why Chicago escaped the fate of many other Rust Belt cities to remain a viable economy and livable city.

However, Illinois and the Chicago metropolitan area, in particular, also suffer from a high degree of “institutional fragmentation” that detracts from competitiveness. In particular, Illinois was cited in a recent Brookings Institute report for its high degree of government fragmentation. As shown in Figure 9, the state has the highest absolute number of general-purpose governments in the US.

Figure 9 – Fragmentation of Governments

State	General governments		Gen Governments per Million people	
	Number	Rank	Number	Rank
Illinois	2,824	1	227	14
Minnesota	2,734	2	556	5
Pennsylvania	2,630	3	214	16
Ohio	2,338	4	206	17
Kansas	2,030	5	755	3
Wisconsin	1,922	6	358	8
Michigan	1,858	7	187	22
North Dakota	1,745	8	2,717	1
Indiana	1,666	9	274	10
New York	1,602	10	84	28

Source: US Census Bureau, 2002 Census of Governments

Figure 10 – MPDI Index – Metropolitan Power Diffusion Index

Metros	MPDI Index		Rank (1992)
	1972	1992	
Philadelphia, PA-NJ	14.3	15.4	1
St. Louis, MO-IL	12.3	14.4	2
Boston, MA	11.2	12.3	3
Chicago, IL	8.3	12.1	4
Pittsburgh, PA	10.7	11.6	5
Scranton-Wilkes Barre, PA	9.26	11	6
Minneapolis-St. Paul, MW-WI	8.53	9.36	7
Detroit, MI	8.05	9.09	8
Harrisburg, PA	7.93	8.98	9
Monmouth-Ocean, NJ	8.19	8.71	10

Source: Brookings Institution (2005)

As shown in Figure 10, Chicagoland’s “power diffusion” is so severe that Chicago ranks fourth in the nation in lack of coordination. While diffusion of power may be beneficial to competitiveness in limited cases because it prevents government over-reaching and allows a greater diversity of small players to be influential within their own areas, many have suggested that that fragmentation complicates public-sector coordination and planning, which likely hinders the city’s capacity to improve competitiveness. From a manufacturer’s point of view, fragmentation means a diversity of stakeholders and multiple decision points, both of which lead to decision-making delays, uncertainty, difficulties in expanding operations, and ultimately business risk.

However, Chicago’s leadership, particularly Mayor Daley, has acknowledged its lack of collaborative capacity. In 1997, he set up the “Metropolitan Mayor’s Caucus,” a body that brings together the region’s 272 mayors to coordinate on issues such as ground transport, utility regulation, taxes, and housing, a sort of “institution for collaboration (IFC) among governments.” Additionally,

business leaders have created World Business Chicago, the Metropolitan Planning Council, and Metropolis 2020, all of which work to improve Chicago's growth. Of these, the Metropolitan Planning Council and Chicago Metropolis 2020, in particular, work to reduce the frictions between the region's governments (Economist, 2006).

From a competitiveness strategy perspective, we found that the Chicago region does not have institutions pursuing "cluster-based" strategies for growth. Instead, we found that both the major economic development institutions (Illinois Department of Commerce and Economic Opportunities, Chicago-Cook County Business Center, City of Chicago Department of Planning and Development), organize their economic development efforts around regions (e.g. North-side vs. South-side Chicago), rather than around cluster strategies. Focusing on regions is not likely to promote clustering, as each region naturally tries to retain existing jobs and specialty areas at the expense of neighboring regions.

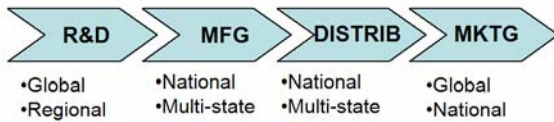
3. The US Processed Food Industry

Before analyzing the Chicago Processed Food cluster, it is first necessary to understand the nature of the Processed Food industry.¹⁵ The processed food industry is one of the largest manufacturing sub-sectors in the US economy. The industry employed 1.44 million people in 2004 and output was valued at \$470 billion, while industry sales were estimated to be \$784. The industry has expanded output by 1.2% CAGR in the period 1994-2003 (Annual Survey of Manufactures, 2004).¹⁶

¹⁵ Food processing refers to the techniques and methods used to transform raw ingredients (i.e., farm products) into food for consumption. Transformation includes activities such as toxin removal, flavor enhancement, nutrition enhancement, preservation, packaging, marketing, and distribution. According to the Cluster Mapping Project (Porter), major sub-sectors of the industry are baked and packaged foods, meat and dairy products, candy and chocolate, food products machinery, coffee, distilled/blended liquors, flour, malt beverages, meat and related products, metal and glass, milk and frozen desserts, milling, paper containers, processed dairy, and specialty foods and ingredients.

¹⁶ Output data here represent the narrowest definition of the cluster, to mean "Food Manufacturing," as defined as NAICS code 311. This narrow definition is necessary because there is no source of output data for the more comprehensive "Processed Food Cluster" as defined by Prof. Michael E. Porter, Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School. The reader should not that throughout this study, both terms employed, but not interchangeably.

Figure 11 – Geographic Scope along Value Chain

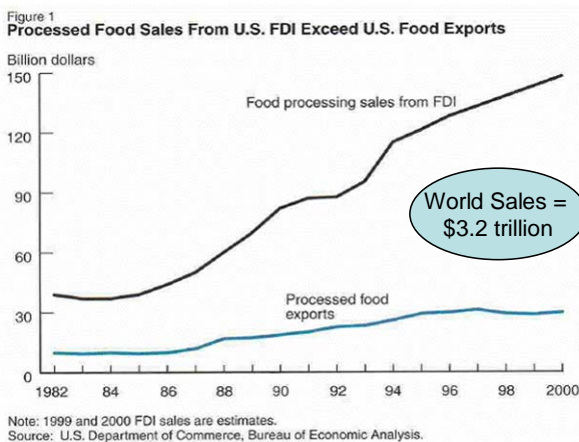


Source: Authors

As Figure 11 shows, some of these activities in the processing of food are performed with a global focus, while others are geared at the national or multi-state level. For instance, large food and beverage companies concentrate R&D, packaging design, and marketing strategies in one or a few locations, as part of central headquarters operations, while manufacturing and distribution are based closer to major population centers. Perishable (e.g., dairy products) and low value-to-weight items (e.g., beverages) are manufactured in several regional locations while products with high value-to-weight (e.g., candy) and longer shelf lives (e.g., packaged foods) are likely to be manufactured from one or two facilities serving the whole nation.

Reviewing exports of processed foods, this distinction becomes even more apparent. According to the USDA, only 6% of world processed food output is traded internationally. Reasons for this phenomenon include transportation costs, perishability concerns, variations in local tastes, phytosanitary

Figure 12 – FDI vs. Exports in Processed Food



Source: Regmi and Gehlhar (2005)

processed food exports go to Canada and Mexico, respectively.

restrictions and other barriers to trade (Regmi, et al 2005). As Figure 12 illustrates, US-based companies sell five times more processed food through Foreign Direct Investment (e.g., Kraft manufacturing facilities in Europe) than through exports sales (e.g. containers of cookies crossing the Atlantic). Interestingly, 42% of US

processed food exports go to Canada and Mexico, respectively.

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4. The Chicago Processed Food Cluster: Overall Performance

Key Findings on Overall Performance of the Cluster, 1990-2004

1. Chicago's Processed Food Cluster **large and leading**
2. Employment has **fallen** at -1.14% CAGR
3. **Wages have risen** at 2.49% CAGR
4. Share of national **output has fallen** by 3.6%

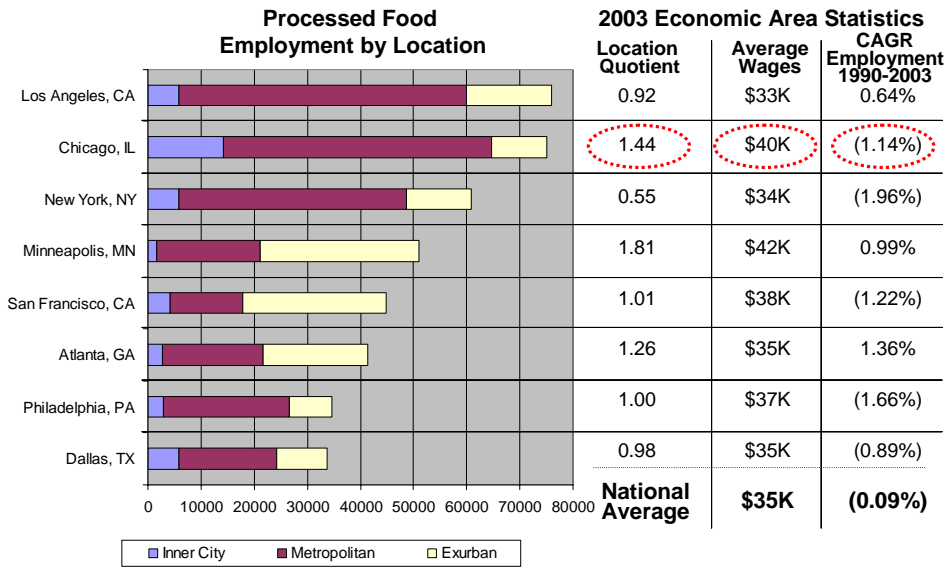
History and Importance of Cluster within Chicago

The processed food cluster is the area's 7th largest employer, with 76,000 workers in 2004. The extraordinary growth of this cluster in Chicago over the past two centuries is a result of its strengths in both agriculture and industrialization. In Chicago, farm products, manufacturing, finance, and logistics converged in the mid- to late-1900s. Over the past 150 years, access to dairy and grains gave rise to a robust dairy, meat, milling, baking, and as technology improved, a specialized processed food cluster built around global branded food companies, such as Kraft, Quaker and Sara Lee.

Chicago Cluster: Large in Size with Falling Employment & Rising Wages

Chicago is among the powerhouse locations for processed food in the nation. As Figure 13 illustrates, Chicago is a national leader in the processed food industry as measured by employment. The city hosts the second-largest workforce devoted to the industry (after California) and has the second-highest employment location quotient (after Minneapolis). Its average wages are second only to those of Minneapolis. Notably, although the bulk of Chicago's processed food industry is located in the suburbs of the city, a significant portion, about 14,000 processed food workers, are based in Chicago's inner city, by far the highest proportion of any processed food cluster nationwide.

Figure 13 – Chicago’s Cluster in the US Context, 2003



Source: Prof. Michael E. Porter, Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School; Richard Bryden, Project Director. Copyright 2006 by the President and Fellows of Harvard College. All rights reserved.

Figure 14 – Employment in the Chicago Processed Food Cluster: 1990-2003

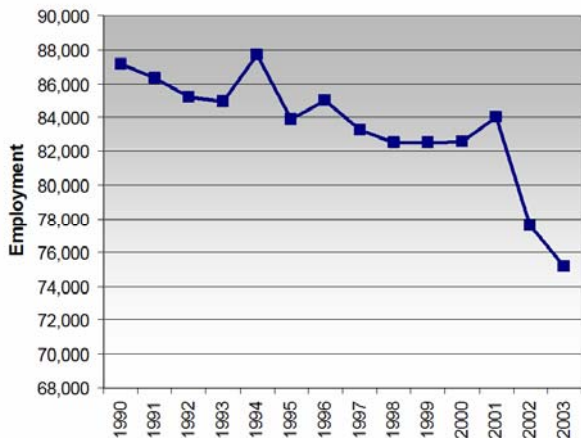
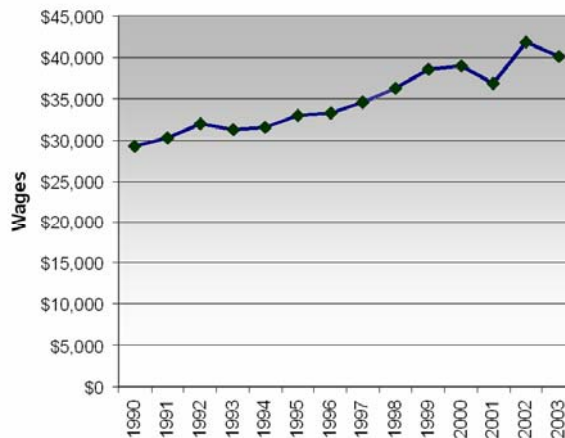


Figure 15 – Wages in the Chicago Processed Food Cluster: 1990-2003



Source: Prof. Michael E. Porter, Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School; Richard Bryden, Project Director.

Source: Prof. Michael E. Porter, Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School; Richard Bryden, Project Director.

The cluster’s employment levels are falling, while wages rise. As shown in Figure 14, employment in the sector decreased by 12,021 (-13.8% change or -1.14% CAGR) in the period from 1990-2003. Annual average wages per capita in this sector, however, increased 37.8% (2.49% CAGR) from \$29,168 in 1990 to \$40,182 in 2003 (Figure 15).

In sections that follow, we explore the reasons why employment has fallen over this time period, which include losses in food-packaging, losses in the baked-packaged sub-cluster, and missed opportunities in growing sub-clusters, including candy and specialty foods.

Chicago Processed Food Cluster’s Share of National Output

In terms of output, as we can see in Figure 16, approximately 40% of the US sales of publicly-traded processed-food companies are generated by Illinois-based firms. Moreover, companies headquartered in the Chicago area concentrate about 12% of the world’s sales (from publicly-traded food processing firms). This information undoubtedly reflects the strength of the Chicago cluster in the internationally-tradable areas of the business (such as R&D and marketing, as well as in actual production through Foreign Direct Investment). However, one should note that “Chicago headquarters share” has been essentially stable during the past 5 years.

On the other hand, as was previously mentioned, production and consumption of processed foods is in large part local. Indeed, there is strong and consistent correlation (about 80%) between states’ share in US population and their share in processed food output.¹⁷ This information is important when analyzing the evolution of Illinois’ share of national output for the past decade.

Figure 16 – Percentage of Public Company Processed Food Sales from Companies Based in IL

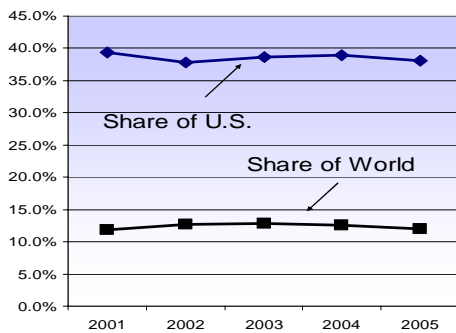
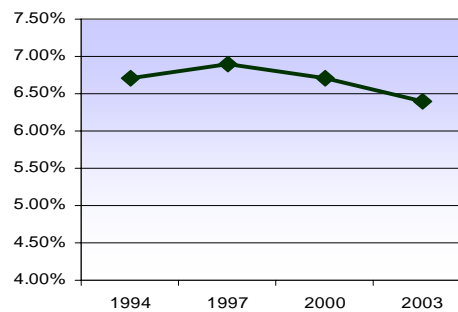


Figure 17 – Percentage of Value of U.S. Processed Food Shipments from Illinois



Source: OneSource

¹⁷ The analysis was performed on data from the US Census Bureau (Population Census, and Annual Census of Manufactures) for years 2000 and 1995.

Specifically, as shown in Figure 17, the cluster's share in national output decreased from 6.63% in 1995 to 6.39% in 2004 (a relative drop of 3.6%); however to the degree that food processing tends to be localized, this may be explainable by the fact that Illinois' share of the US population decreased from 4.60% in 1990 to 4.41% in year 2000 (or relative change of 4.1%) (US Census Bureau). Viewed this way, we see that the "production location quotient" (the ratio of share of processed food to share of national population) has stayed very nearly constant, rising only slightly from a 1.441 to 1.449.

5. Chicago Processed Food Cluster Competitiveness Compared to Others

Key Findings on Chicago Food Cluster Competitiveness

1. In **output and employment**, Chicago's processed foods cluster is the slowest **shrinking** cluster among a group of large, shrinking clusters
2. Likewise in productivity, Chicago is among a group of cities with **slow growing productivity** (around 2%), but it is first among this group.
3. Chicago's **loss of employment** in two important sub-clusters warrant attention: **Packaging** and **Baked Packaged goods**. Losses in Packaging account for 80% (-9698 jobs) of all losses, however much of this is due to changes in national trends, and to losses in non food-related packaging. Losses in Baked Packaged goods (-1965 jobs, 16% of total jobs lost) are more concerning, and Chicago is losing to Atlanta, LA, and Minneapolis in this area.
4. **Chicago is also missing opportunities in two sub-clusters: Candy and Chocolate, and Specialty Foods. The former is partly related to trade-barriers on sugar. The latter is likely due to Chicago's demand conditions**

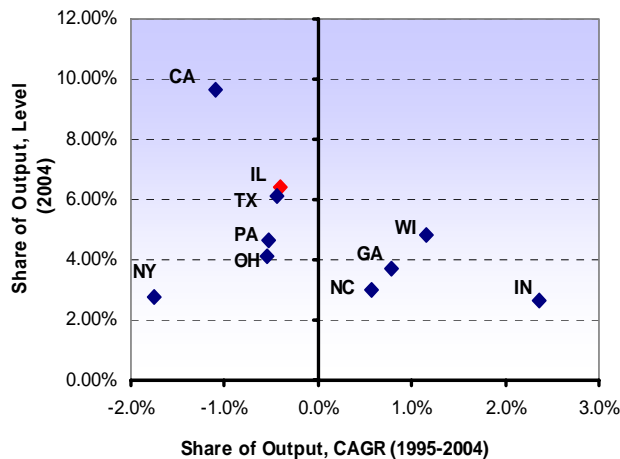
In order to formulate strong recommendations for growth of the Chicago processed foods cluster, we explore how it compares to processed foods clusters in other locations in terms of output, employment, and productivity. We also explore sub-clusters in which Chicago and other locations have been "winning" and "losing."

Output: Among cities losing share, Chicago is losing the least

Since output data are available from US census data on a state-wide basis, the following data compare states to each other, rather than metropolitan or economic areas. As shown Figure 18, Illinois

ranks a distant second to California in level of output, closely trailed by Texas. In terms of change in output between 1995 and 2004, the states split into two clear groupings – those growing (NC, GA, WI, IN), and those that are shrinking. Illinois falls in the latter group, with a CAGR of -0.4%.

Figure 18 – Output in top producing States (2004)



Source: US Census Bureau, 2004 Annual Survey of Manufactures

It is, however, declining less than the other states in decline. Also notable is Indiana, part of which belongs to the Chicago cluster, which is growing at a tremendous rate of 2.4% (CAGR), roughly twice as fast as the next state, Wisconsin, which also overlaps somewhat with the Chicago cluster.

Productivity: Illinois' productivity is high but slow-growing

The Illinois manufactured food cluster ranks 4th in the country, with value-added per production-payroll-hour 15-20% higher than the US average (depending on the specific activity).¹⁸ As Figure 19 emphasizes, Illinois appears to be an attractive location, as value-added is 15-20% higher but wages are only 10-15% higher than the national average.

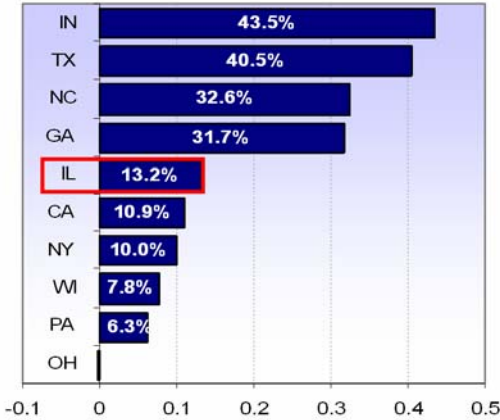
¹⁸ The importance of productivity to the processed food industry cannot be overemphasized. Because of the industry's scale, a firm's small gains or losses in productivity relative to a competitor can make or break profitability. Industry-wide margins in food manufacturing, including gross margins and net margins, are significantly lower relative to other manufacturing and relative to other sectors (Reuters, Food Processing Benchmarks, 2006). Thus, productivity, the measure of the rate at which outputs of goods and services are produced per unit of inputs, is a key measure in understanding the cluster's performance.

Figure 19 – Productivity in Top Producing States (2004)



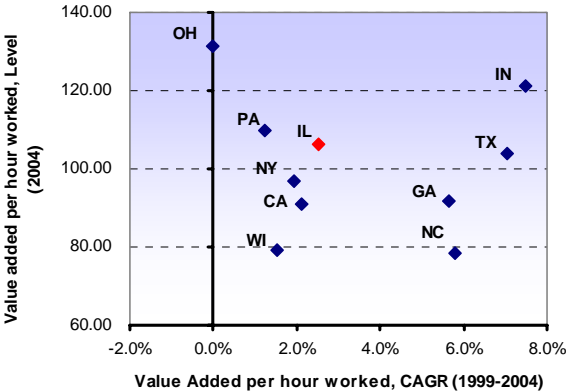
Source: US Census Bureau, 2004 Annual Survey of Manufactures

Figure 20 – Productivity Growth Among Top Producing States



Turning to growth in productivity, we see that the Illinois manufactured food cluster increased its productivity by a total of 13.2% from 1999 to 2004, ranking 5th among states. Figure 19, 20, and 21 demonstrate, major states cluster into two distinct groups: those with productivity growing around 6% during this period (Indiana, Texas, North Carolina, Georgia) and those with growth clustering around 2% CAGR (Illinois, Pennsylvania, New York, California, Wisconsin, and lagging behind Ohio).

Figure 21 – Productivity in top producing States (2004)



Source: US Census Bureau, 2004 Annual Survey of Manufactures

Illinois has the fastest improving productivity among the lower group, but is still well behind the four cities in the first group. As Figure 20 shows, there is no strong relationship between level of productivity and growth of productivity. While Ohio's stagnant productivity growth might be explained by the fact that it already has the highest levels of productivity, the hypothesis that growth of productivity is slower among states with already high productivity levels does not fit the remainder of

productivity is slower among states with already high productivity levels does not fit the remainder of

the data¹⁹. In particular, Indiana is both enormously productive (ranking second in productivity level), and fast improving (ranking first in productivity growth).

Employment: Chicago losing employment while Los Angeles, Minneapolis, Atlanta gain

We examined Chicago's change in employment against that of other cities using two different geographical definitions: the "Metropolitan Statistical Area" ("MSA", Figure 22) and the wider measure of Economic Area ("EA", Figure 23). Let us first examine levels, and then growth rates based on areas defined by both geographic definitions. Both analyses examine data from 1990 to 2003.

Under both definitions, Chicago emerges as the largest or second largest cluster by employment level, in close competition with Los Angeles. Using the MSA, the only cluster with a similar level of employment is New York, with all the other clusters having at most 22% as much employment as Chicago. Using the EA, the Chicago and Los Angeles clusters are again head-to-head, however there are a broader range of near competitors behind them - New York, Minneapolis/St. Paul, San Jose/ San Francisco/Oakland, and Atlanta – each having at least 50% of the employment of the Chicago cluster.

The employment *growth* analysis reveals more troubling news for Chicago. Using the MSA definition, all major clusters are losing share of national employment - a sign that production is moving farther away from cities – with Chicago losing among the most workers percentage-wise. Using the wider EA, we see that the large clusters are split into two distinct categories: those gaining national share of employment (Los Angeles, Minneapolis, Atlanta, each gaining roughly 0.5%), and those loosing between 0.5% and 1% of share (Chicago, New York, San Jose/San Francisco/Oakland, Philadelphia, Dallas), with no large clusters falling in between. In the sections that follow, we identify the sub-clusters which account for this divergence in growth rates.

¹⁹ Confirming this hypothesis, a linear trend-line through the points on figure 26 is almost flat, with an R-squared of only 0.02. If clusters with higher productivity experience slower growth, we would expect to see a strong downward trend-line.

Figure 22 – Processed Food Cluster, Share of National Cluster Employment, by Metropolitan Area

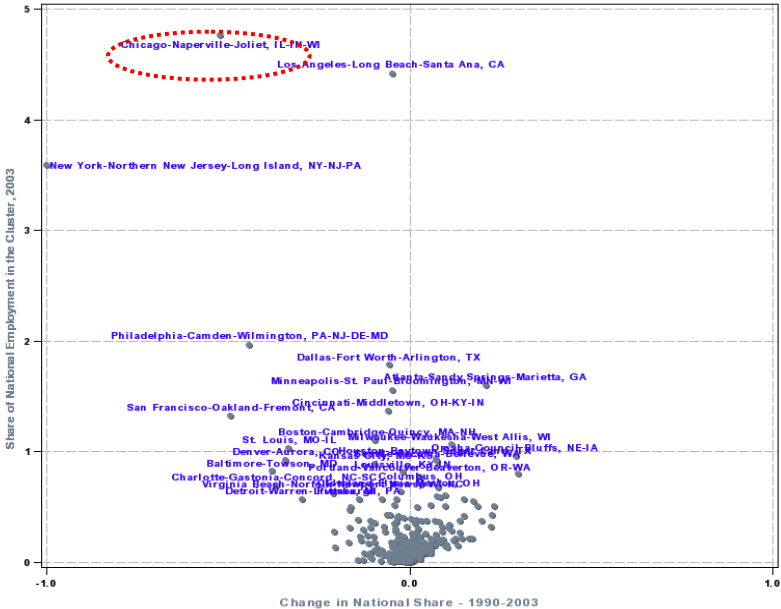
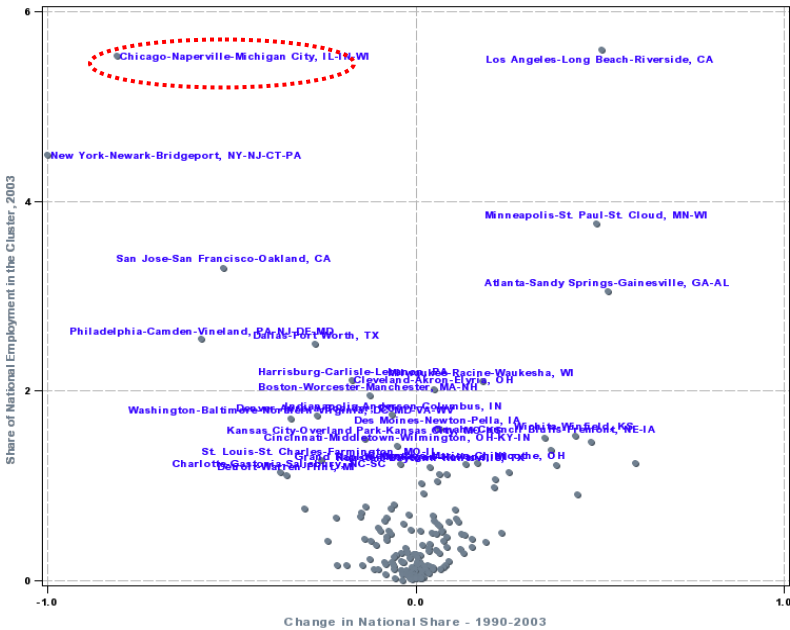


Figure 23 – Processed Food Cluster, Share of National Cluster Employment, by Economic Area

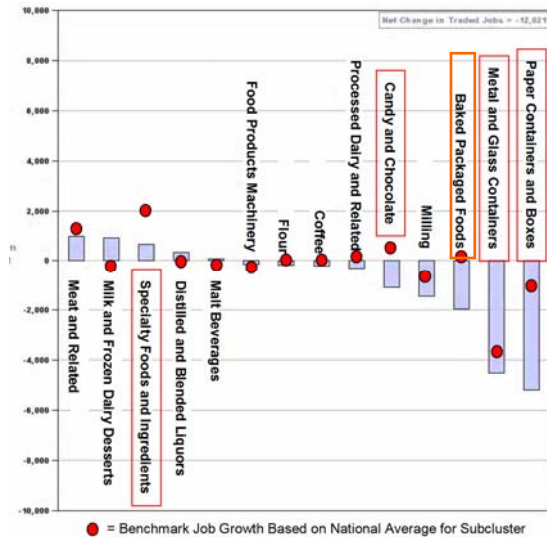


Source: Prof. Michael E. Porter, Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School; Richard Bryden, Project Director.

Sub-clusters: Losing in Packaging, Baked-Packaged Goods; Missed opportunities in Candy and Specialty Foods

It is very helpful to examine the different sub-clusters in which Chicago has done well or poorly, and compare this performance to that of other locations in these sub-clusters, and many of our recommendations flow from this exercise. Figure 24 sets the stage for this analysis by looking at Chicago's performance in each of the sub-clusters. Each bar represents the amount of employment lost or gained in that sub-cluster between 1990 and 2003.

Figure 24 – Performance by Sub-cluster of Chicago Processed Food Cluster



Source: Prof. Michael E. Porter, Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School; Richard Bryden, Project Director.

or gained in that sub-cluster between 1990 and 2003.

The red dots indicate how much employment “should have” been gained or lost in that sub-cluster given national trends and the overall size of the Chicago cluster.

In the final analysis, many of our recommendations deal with the decision about which sub-clusters Chicago must focus on. Figure 24 allows us to identify the five sub-clusters which we will be discussing in greater detail. The largest loser, by far, has been *Paper Containers and Boxes*. This accounts

for 5199 jobs out of the total 12,021 or fully 43% of all losses.

As shown by the location of the red dot, this loss is far more than would be expected on the basis of national trends alone. Similarly, *Metal and glass containers* has lost 4499 jobs, but this is roughly on par with national trends. *Baked Packaged Foods* lost roughly 2000 jobs, when national trends show it as growing slightly. More surprisingly, an area in which Chicago has traditionally been strong, *Candy and Chocolate*, lost many jobs while the national trend continued upward. Finally, we emphasize that while there has been some growth in specialty foods, Chicago has not managed to capitalize on the growing national trends in this areas, in large part due to its less than “leading” demand sophistication.

How does Chicago's sub-cluster performance compare to other major clusters? For each location, we calculated the jobs gained/lost in each sub-cluster over 1990-2003 and compared this figure with what *would be expected* given the sub-clusters previous employment size, scaled by national employment trends in each sub-cluster. This difference between the actual and the expected employment change is shown in Figure 29.

Figure 25 – Relative winners and losers by sub-cluster relative to expectations								
<i>Difference between actual loss/gain and expected given subcluster growth trend</i>	Chicago	Atlanta	Dallas	Los Angeles	Minneapolis	New York	Philadelphia	San Francisco
Baked Packaged Foods	-1965	5097	-496	4049	3503	-3608	-2004	-3319
Candy and Chocolate Metal ,Glass Containers	-1076	477	779	1539	224	-372	-2173	1362
Milk ,Frozen Desserts	-1099	290	362	-1155	395	-1830	-1177	-1832
Paper Cntnrs and Boxes	1129	-306	-13	-847	118	-1433	-469	612
Spec. Foods, Ingrdnts	-3611	864	1281	411	777	-2602	-1883	402
	-1640	12	-4438	-1532	1094	-3475	-147	-1462
Source: Prof. Michael E. Porter, Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School; Richard Bryden, Project Director.								

To highlight several trends, Chicago is similar to other “old” food processing cities, such as New York and Philadelphia. These three cities are losing jobs relative to national trends in all sub-clusters, with the exception of Chicago's growth in milk and frozen desserts. This confirms the characterization of Chicago as being among the large, old food processing clusters that are generally doing poorly, but with Chicago doing somewhat better than the rest of this pack.

While Chicago underperformed by 1,965 jobs in Baked Packaged Foods over 1990-2003, Atlanta, Los Angeles, and Minneapolis over-performed 5097, 4049, and 3503 jobs respectively. In each of these three cities, this sub-cluster was the largest growing sub-cluster. At the same time, New York, San Francisco, and Philadelphia under-performed by 3608, 3319 and 2004 jobs, respectively. As the reader can see, it is this category which constitutes the greatest overall movement among cluster relative to national trends. Central to Chicago's overall performance, we see that in paper containers and boxes Chicago is experiencing its worst under-performance of any category, with 3611 jobs lost relative to

what would be expected. It is accompanied by other old industrial centers such as New York and Philadelphia while all other major food cluster cities are gaining.

A closer look at the Packaging sub-cluster: Much of the Loss not related to Processed Foods

Since packaging job losses constitute such a large portion of Chicago's job losses, the issue deserved further analysis. The Cluster Mapping Project defines the processed food cluster to include not only food manufacturing (NAICS 311) but also metal, glass, and paper food packaging. We found that the data on losses in paper packaging an interesting conundrum.

In interviews with the Fibrebox Association, a packaging IFC, we learned that processed food industry accounts for 30-35% of total paper packaging output, while durable goods (such as white goods) account for the remainder.²⁰ Since a large portion of American durable goods production has recently shifted overseas, cardboard box manufacturing also shifted abroad. The data on the paper packaging sub-cluster includes all paper packaging which therefore overstates losses related to processed foods. In fact, from 2000-2004, paper packaging output for processed foods actually grew 8% (Fibre Box Association, 2004). We therefore discount the job losses in paper packaging as primarily due to durable goods, though we remain concerned that overall weakness in paper packaging could impact productivity in the processed food component of this subcluster.

Metal and Glass packaging is a different story. Here, the large losses in Chicago's employment in these sub-clusters reflect national trends, moving away from Metal and Glass and towards plastic. Thus, as Figure 25 shows, Chicago's loss in this sub-cluster reflects national trends.

²⁰ Brian O'Banian, Fibrebox Association (847-364-9635), personal communication, 5 April 2006.

Specialty Foods: Opportunity for Chicago

As mentioned, the Chicago cluster appears to be missing out on a growing national trend in specialty foods, while other locations – particularly California – capitalize on it. In fact, California takes the lead in “preserving of fruits and vegetables and specialty foods,” with 20% of the market, compared to Illinois ranking of 8th and market share of only 3.5%. Moreover, California’s share of market divided by share of population is 1.68, compared to only 0.81 in Illinois. That is, California is producing twice as much value in specialty foods per person as compared to Illinois. Given that Chicago is shrinking in most sub-clusters, and that many of these specialty foods can be shipped over longer distances, it is a missed opportunity for growth.

Competing on Innovation: Chicago above average but weak for its size

In the fast-moving world of processed foods, innovation is critical. Showing slightly above average level of innovation, the Chicago processed food industry files an average of 6.92 patents per 10,000 employees versus the processed food industry’s national average of 5.94 patents per 10,000 employees.²¹ While still above average, this ranks Chicago 15th among processed food clusters – well below where Chicago ought to be to keep its position.

As American consumers become more health-conscious²², consumers’ demand for functional foods (e.g., foods that confer health benefits while also delivering nutrition and flavor) increase dramatically. One such blockbuster innovation launched in 2005 was Soft & Smooth™ whole grain white bread. Sara Lee (Chicago, IL) created this product in response to consumer demands for better-than-average fiber content in soft white bread. Soon after this launch, General Mills (Minneapolis, MN) rolled out a similar whole wheat white flour concentrate used in the Country Hearth brand to make another “albino whole wheat.” Not to be undone, the leader in the white bread industry, Interstate

²¹ Harvard Business School’s Institute for Strategy and Competitiveness, Cluster Mapping Project.

²² “Obesity: Re-shaping the Food Industry,” JP Morgan Equity Research, January 24, 2006.

Bakeries (Kansas City, MO), makers of Wonder Bread, introduced a 100% whole grain white in early 2006, calling it Wonder White Bread Fans. While this is just one example of the fiercely competitive nature of new product development in the food processing industry, it illustrates many of the challenges that processed food firms face: market research, innovation management (which takes upwards of 12 months at major bakeries companies), and market timing, not to mention the cost of innovation.

6. Diagnosing the Chicago Processed Food Cluster

Key Issues Identified in the Diamond Analysis

1. **Demand Conditions are weakened** by decreasing share of population and **non-leading tastes**.
2. **Factor Inputs** are strong, but **labor shortage** and the controlled-prices of **sugar** are problematic.
3. **Context for Strategy and Rivalry** is generally good, but pre-dominance of large public firms indicates **barriers-to-entry for smaller firms**.
4. **Related and Supporting Industries** are strong, but **no cluster-wide IFC exists**, and highly fragmented governance increases need for one.

Why has Chicago performed the way it has, what are the areas in which it must improve, and what are opportunities for growth? We begin this analysis by examining the diamond conditions for the Chicago Processed Food cluster. Figure 27 below summarizes our findings for the conditions of the Cluster Diamond.

Figure 27 – Chicago Processed Food Cluster Diamond Conditions

	Strengths	Weaknesses
Demand Conditions	<ul style="list-style-type: none"> • Preferences representative of major U.S. metro areas • Ethnic diversity • Above average candy consumption relative to other U.S. regions 	<ul style="list-style-type: none"> • Demand is not <i>leading</i> (only representative) • Lagged in adoption of natural foods • Population growth below national average
Factor (Input) Conditions	<ul style="list-style-type: none"> • Central location and largest transportation hub in U.S. • Proximity to Midwest agriculture • Access to fresh water (Lake Michigan) • Top 10 manufacturing workforce 	<ul style="list-style-type: none"> • U.S. sugar price ~3x world price • Scarcity of skilled English speaking labor • Scarcity of food technologists (improving)
Context for Firm Strategy And Rivalry	<ul style="list-style-type: none"> • High concentration of local competitors • U.S. regulatory environment favoring intense competition (e.g. antitrust) • 77% of local food companies have less than 50 employees 	<ul style="list-style-type: none"> • Cluster dominated by large public companies – few small private firms
Related and Supporting Industries	<ul style="list-style-type: none"> • Advertising agencies, consulting firms, HQ for most industry IFCs (ex DC) • Four university food science programs • Largest food trade show in U.S. • FDA center for food safety and technology • Superior waste water infrastructure 	<ul style="list-style-type: none"> • No Chicago-focused IFC or government entity with cluster-wide perspective

Source: Authors

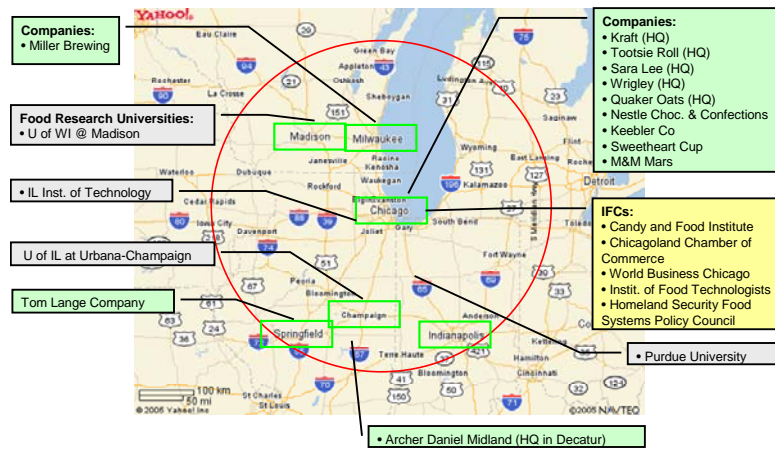
Demand Conditions. Among Chicago’s strengths in demand conditions, its rich ethnic diversity translates into a wide range of tastes. Industry specialists interviewed by our team regarded Chicago’s tastes as representative for major US metropolitan areas. Furthermore, candy consumption in the Midwest appears to be higher than in other regions of the US, which makes Chicago’s local demand relatively sophisticated in this sub-area.²³ The important weakness however, as specialists interviewed pointed out, is that while Chicago’s taste in foods is nationally representative, it is by no means *leading*, and thus local firms lose out in discovering and profiting from new trends.²⁴ The predominant example of this has been Chicago’s lag in the adoption of premium “natural” and organic foods relative to the west coast and California in particular.²⁵ Moreover, as previously discussed, Illinois has lost population

²³ National Confectioners Association/Chocolate Manufacturers Association as cited on <http://www.gone-ta-pott.com/Candy.html>.

²⁴ Interviews with executives at several Chicago processed food companies and a professor in food science at the University of Illinois.

²⁵ For example, California invented “California Cuisine” characterized by an abundance of fruit and vegetables and popularized by Wolfgang Puck by catering to high profile celebrities such as the Oscar’s after-parties. California has also popularized sushi, invented its own California rolls, and exported its California Cuisine around the country with chains such as the California Pizza Kitchen. Furthermore, California has 39 Whole Foods Markets relative to Illinois’s 9 Whole Foods Markets (one store per 920,000 residents in CA vs. one store per 1,413,000 residents in Illinois.)

Figure 28 – Geographic Description of the Cluster



Source: Authors

share, which means that local producers cannot rely on growth of demand due to local population growth to maintain the cluster's share in US output.

Factor (Input) Conditions. The most important strengths in the area of factor inputs for Chicago's food processing cluster is Chicago's location and position as a transportation hub, and its proximity to Midwest agriculture. Among weaknesses, employees interviewed and reports such as those by the Candy Institute²⁶ identified a scarcity of sufficiently skilled labor, particularly English speaking workers (Carnes, 2005). A second key issue to be addressed is sugar prices, which are three-times higher than international prices due to US trade barriers. Given that Chicago is an enormous producer of Candies and Chocolate, this is an important issue, and will be further discussed in the final section.

Another significant weakness of Chicago's factor conditions is its workforce – specifically, maintaining a sufficient workforce as the current force grays. Over the past few years, a great deal of effort has gone into identifying regional workforce shortages. The Critical Skills Shortages Initiative lead by the Boone and Winnebago Workforce Investment Board (WIB) evaluated the regions capacity and availability of critical manufacturing occupations and found significant shortages in machinist, industrial machinery mechanics, and maintenance occupations in the region.

Context for Firm Strategy and Rivalry. The Chicago Food Processing cluster has strengths in this area, such as a high level of local competition due to the large number of local firms and competitive-embracing regulatory environment of the US generally. However the most relevant weakness for purposes of our discussion is the pre-dominance of large public companies, rather than smaller, private companies. This cluster is dominated by large, public firms, both in absolute terms and relative to national trends. The Chicago-area public firms command 38.1% of sales by public firms

nation-wide, while its private firms command only 4.7% of the sales by private firms nation-wide.²⁷ This

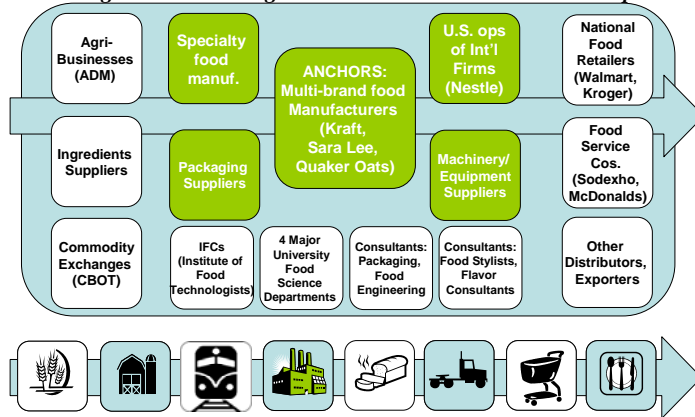
indicates the possibility that Chicago has relatively high barriers to entry for smaller, younger, private firms than other parts of the country. Given that smaller firms may be more dynamic or

Source: Authors

innovative, this can become a serious weakness. Analysis by industry IFCs, such as the Food and Candy institute, concur with this finding (Harder, 2006).

Related and Supporting Industries. Here again, this cluster has impressive strengths in this area, including the presence of advertising agencies, consulting firms, the headquarters of most related IFCs, four Universities with food science programs, large trade shows, the FDA center for food safety and technology, and superior waste water management facilities. Figure 29 shows a sampling of the many related and supporting industries within a 3-hours-drive (180 miles) radius and Figure 30 shows the cluster map, and. However the important weakness we identified is that the Chicago area as a whole has no IFC with a *cluster-wide* mandate.

Figure 29 – Chicago Area Processed Food Cluster Map



²⁷ Authors' analysis from OneSource industry data via Baker Library.

7. Recommendations

Summary of Recommendations

1. **Build a cluster-wide IFC** to deal with lack of IFC and government fragmentation
2. **Analyze** the losses in Packaging and **promote** on plastics for growth
3. **Tap into** specialty foods markets, increase demand through advancing local tastes.
4. **Reduce barriers-to-entry** to small firms through a public test-kitchen, accessible training programs.
5. **Lobby to reduce or eliminate price-controls on sugar**
6. **Support the workforce training initiative** of the Boone and Winnebago Workforce Investment Board (WIB)
7. **Build a state-level Competitiveness Council**

1. Launch a Cluster-Wide IFC. There are many organizations, some shown in Figure 34, that provide support or collaboration either within the Food Processing industry or to the Chicago businesses environment more generally. While this includes several strong IFCs and excellent research and education programs at nearby Universities, there is no IFC that is both focused on the Chicago area and allows for collaboration across the whole food-processing cluster. Thus cluster-wide issues are rarely addressed, and opportunities to move the cluster forward and benefit from spillover effects are missed.

Figure 34: Chicago Processed Food Supporting Institutions

<p>IFCs</p> <ul style="list-style-type: none"> • Mid-America Agricultural Trade Organization • Candy and Food Institute • Chicagoland Chamber of Commerce • Homeland Security Food Systems Policy Council • World Business Chicago • Institute of Food Technologists • etc 	<p>Governmental</p> <ul style="list-style-type: none"> • Department of Commerce and Economic Opportunity (State) • Chicago-Cook Business Center (County) • etc
<p>Academic Inst's with Food Science Depts</p> <ul style="list-style-type: none"> • Illinois Institute of Technology • Purdue University • University of Wisconsin at Madison • University of Illinois at Urbana • etc 	<p>Supporting Industries</p> <ul style="list-style-type: none"> • Food-specialized Consulting firms • Food-specialized Marketing firms • etc
	<p>Trade Shows</p> <ul style="list-style-type: none"> • PROCESS Expo Chicago (processing technology) • Fancy Food Show (specialty foods) • Food Marketing Institute Show • etc

A clear example of how the lack of a focused IFC is constraining the Chicago Cluster's ability to effectively solve common problems is the issue of labor shortages. Several of our interviewees mentioned that food processing firms are having a hard time finding skilled, English-speaking, entry-level labor.

Moreover, the Food and Candy Institute has specifically mentioned this problem in two of its reports. However, cluster companies have not been able to take advantage of a workforce development program called “Critical Skills Shortages Initiative” by the Illinois State Department of Commerce. This program has announced several grants for training programs, but not focused on food processing firms. Moreover, in late 2005 the Chicagoland Chamber of Commerce, the Department of Commerce and World Business Chicago jointly applied and lost a bid before the US Labor Department for a grant to study regional work force innovation and economic growth. A cluster-focused IFC, by incorporating input from producers, suppliers, universities, and NGOs, would facilitate making a stronger case before government, or even providing finance for some a project on its own.

Thus we recommend that Industry leaders, together with academic and government stakeholders, come together to form a “Chicago Food Processing Competitiveness Cluster” to address the joint issues that affect them. Examples of food processing IFC’s promoting cluster competitiveness are the Northwest Food Processors Association (NWFPA) and Portland Economic Development Food Processing Target Industry Plan.²⁸

2. Study Packaging Losses and Promote Plastics. It is easy to see packaging as peripheral to the processed food cluster, however packaging costs make up an average 10% of the final cost of processed foods. As noted, there has been a shift towards the use of plastics instead of metal and glass, and in some cases, paper. On the other hand, many of the losses in paper packaging are due to the off-shoring in production of non-food, durable goods, with little loss in food-processing applications per se. A reasonable hypothesis for remaining losses in food-packaging is rising productivity. Specifically, the Chicago area has the largest number of academic R&D facilities working on packaging for process foods, including Wisconsin State’s “School of Food Packaging.” If productivity increases in food

²⁸ Northwest Food Processors Association <http://www.nwfpa.org/>

packaging occur, they are most likely to occur in this region first. Our recommendations for Chicago regarding packaging are to:

- Focus on opportunities to specialize in the fastest growing area – plastics;
- Analyze, through IFC's or Universities, the reasons behind lost share in paper packaging, including the hypothesis that productivity increases have led to reduced employment.

3. Reach out in Specialty Foods to Overcome Weak Local Demand. Demand conditions for Chicago's processed foods are weak in two areas. First, the region's population is growing slower than the national average and thus its share of national population is shrinking. As analyzed above, since much of processed food is consumed locally this weakens demand in the cluster's primary market. The problem can be solved by reaching out to other markets, however here Chicago runs into the weakness that its tastes are nationally representative, but by no means leading. This has left Chicago and Illinois behind in new product areas: as noted above, Illinois produces only half as much specialty food per person as California, and has only a fifth of its market share (US Census Bureau, 2004).

What can be done about this? It is difficult to change local tastes. Attempts have been made to increase the sophistication of Chicago's tastes through a campaign including special awards granted by Mayor Daley, but to limited effect. One way to address sophistication of demand would be to use the many food trade shows (Food Marketing Institute Show, Specialty Food Show) held in Chicago to stimulate demand. Often, such trade shows have "public days" wherein non-industry affiliated citizens attend and sample the newest products. This strategy would literally expose Chicagoans to leading tastes in order to stimulate demand.

However something could be done to improve Chicago area firms' visibility into leading markets with respect to more tradeable (packaged, preserved) foods. Once a food competitiveness council or similar IFC is formed, it can locate representatives in California and other leading areas to provide market intelligence and liaise with retail chains. Finally, the appropriate IFC or government office could

assist in providing firms with market research on specialty foods and by organizing trips to areas and retail outlets on the leading edge of demand sophistication.

4. Reduce Barriers-to-Entry for Small Businesses through Public Test-Kitchen. As noted in the discussion of Chicago's diamond conditions, this cluster is dominated by large, public firms, with Chicago's public firms commanding 38.1% of sales by public firms nation-wide, but private firms commanding only 4.7% of the sales by private firms nation-wide. This high barriers to entry implied by this situation may be preventing smaller, more dynamic firms from entering the market.

How can we solve this problem? First, one need regarding barriers-to-entry is the need to create a public test kitchen that can be rented out (Harder, 2006). The requirement of a test kitchen constitutes a major capital requirement that new and small firms have trouble meeting. We recommend that a government agency or IFC provides such a public facility. In addition, consultation services could be provided along-side access to this kitchen, to create a full "incubator" for new food processing firms. Second, food safety requirements, especially after September 11th, have constituted a high barrier for small firms entering the market. Thus training and workshops in community colleges and other accessible venues could help overcome this constraint. Finally, the Chicago area is fortunate to be in close proximity to a number of universities providing R&D in food processing and packaging innovations. Closer linkages, potentially through an appropriate IFC, could help improve the movement of ideas from these universities through to commercial markets.

5. Lobby to Reduce or Eliminate Price Controls on Sugar. As mentioned under "Factor Inputs" in the diamond analysis, US trade barriers on sugar, result in a high price, roughly 2-3 times the world price. Chicago is especially hard-hit by this, as Illinois is the nation's second largest producer of Candy and Chocolate (with an output share of 11.59%), after Pennsylvania (16.79%). Reports by the Food and Candy institute clearly identify this as a major issue. Moreover evidence suggest that it is

having an impact: Kraft moved its LifeSavers production to Quebec – resulting in the loss of 600 jobs – with the stated reason of bypassing sugar tariffs. This is a classic case wherein an IFC can provide a forum for collectively advocating for a pro-competitive change in policy. Thus we recommend that either a sub-cluster IFC, or the recommended Chicago Food Competitiveness Council lobby actively for removing these tariffs. The latter organization would be preferable, as the request would be more legitimate coming from a broad range of producers rather than from candy producers alone, for example. Moreover such a campaign could provide early success to the IFC and a clear “payoff” to its stakeholder, strengthening involvement.

6. Support Workforce Training Initiatives. Over the past few years, a great deal of effort has gone into identifying regional workforce shortages. The Critical Skills Shortages Initiative led by the Boone and Winnebago Workforce Investment Board (WIB) evaluated the region's capacity and availability of critical manufacturing occupations and found significant shortages in machinist, industrial machinery mechanics, and maintenance occupations in the region. The results of this effort included funding for marketing and expanded training to address these workforce shortages. Given the food processing industry's reliance on these occupations, Winnebago County should be supportive of and involved in the efforts of the WIB which include bolstering opportunities in manufacturing and promoting an influx of younger candidates to replace the aging workforce.

7. Reorganization of Government Economic Development Activities. In addition to recommendations for the Chicago Processed Food Cluster, our analysis has led us to one recommendation for the state of Illinois and City of Chicago. Illinois and Chicago governments organize their economic development activities by geography (e.g. Northwest Chicago) which is antithetical to promoting cluster benefits across the region and causes government officials to focus on dividing benefits versus producing collective gains. We recommend government reorganize its economic development activities around industry clusters.

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