



Above: Detroit, MI, July 1998 (Elvin Wyly); below: Vancouver, July 2006 (Elvin Wyly)

Analyzing Metropolitan Economies

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Analyzing Metropolitan Economies¹

“Canada’s cities, particularly those at the top of the urban hierarchy, have increasingly become centres of ‘knowledge economy’ activities involving high-order services and the manipulation of information rather than physical material. ... At the same time, less-specialized jobs for workers with lower levels of educational attainment or lacking ‘modern’ (e.g., information technology) skills are in decline. Thus there is a strong possibility not only that a portion of the labour force will be severely disadvantaged by the continuing ‘non-industrial revolution,’ but that the labour market will continue its polarization into ‘good jobs’ and ‘bad jobs.’”

William J. Coffee and Richard G. Shearmur²

“Vancouver ... is displaying many of the characteristics of the post-industrial era. ... The city has been propelled through stages of primary, secondary, and tertiary economic activities and now quaternary activities characterize its civic economy. Our policy framework as a city must shift to take account of these facts.”

Walter G. Hardwick³

“Detroit, argued journalist Ze’ev Chafets in an influential *New York Times* article and subsequent book, became America’s ‘first major Third World city’ in the wake of the 1967 riot. ... The bleak landscapes and unremitting poverty of Detroit in the 1970s and 1980s are the legacies of the transformation of the city’s economy in the wake of World War II, and of the politics and culture of race that have their origins in the persistent housing and workplace discrimination of the postwar decades. What hope remains in the city comes from the continued efforts of city residents to resist the debilitating effects of poverty, racial tension, and industrial decline.”

Thomas J. Sugrue⁴

“This technique ... permits the identification of the results of factors (a) operating more or less uniformly nationally (even though having a different impact upon different regions), and (b) operating more or less specifically in a particular region. ... It is conceptually simple and does not make impossible demands upon data.”

Edgar S. Dunn, Jr.⁵

¹ Revised, expanded, and adapted from methods outlined in John S. Adams (1993). “Analyzing the Metropolitan Economy.” [Project requirements for Metropolitan Analysis course.] Minneapolis: Department of Geography, University of Minnesota.

² William J. Coffee and Richard G. Shearmur (2006). “Employment in Canadian Cities.” Chapter 6 in Trudi Bunting and Pierre Filion, eds, *Canadian Cities in Transition: Local Through Global Perspectives*. Don Mills, ON: Oxford University Press, 249-271, quote from pp. 269-270.

³ Walter G. Hardwick (1974). *Vancouver*. Don Mills, ON: Collier-Macmillan, p. 188.

⁴ Thomas J. Sugrue (2005). *The Origins of the Urban Crisis: Race and Inequality in Postwar Detroit*. Second Edition. Princeton: Princeton University Press, p. 270-271

⁵ Edgar S. Dunn, Jr. (1960). “A Statistical and Analytical Technique for Regional Analysis.” *Papers and Proceedings of the Regional Science Association* 6, 97-112, quote from p. 97.

Between 1987 and 2000, total employment in the Vancouver Census Metropolitan Area (CMA) grew from approximately 746 thousand to just over one million, for a growth rate of 40.05 percent. Nationally, however, employment grew by only 18.49 percent -- from 13.6 million to 16.1 million. If job growth in the Vancouver region had only kept pace with national trends, the region's employment in 2000 would have been 883,466 -- substantially less than the actual job base at the end of the 1990s. The vibrant regional growth of the Vancouver area, therefore, resulted in an *inward shift* of 160,734 jobs from other parts of the country. This figure is the difference between the actual regional employment in 2000 (1,044,200) minus the regional employment in 2000 assuming parity with national growth (883,466).

Economic trends in the late 1980s and through the 1990s thus left Vancouver with a *relative job surplus*. This surplus of 160,734 jobs resulted from the combined effects of two processes:

- 1) The metropolitan area specialized in industries that enjoyed particularly rapid job growth; this is referred to as the “mix” or “share” effect;
- 2) The metropolitan area's industries performed better than their national counterparts did; this is known as the “local growth” or “shift” effect.

Shift-Share Analysis: a technique used to analyze changes in one place compared to a ‘reference’ area -- for instance, Vancouver compared to all of Canada. Given a set of categories (e.g., employment across industrial sectors), the technique identifies two separate components of growth and decline: 1) the “mix” or “share” effect measures the consequences of specialization, while 2) the “local growth” or “shift” effect captures differences between local categories and their national counterparts.

Shift-share analysis is a simple method designed to disentangle these two effects. It is widely used to understand how cities' economic fortunes compare with other cities and regions. It allows us to separate aspects of growth or decline that are in large part the result of histories of economic and industrial specialization, from those aspects that result from differences within the same industry from place to place. Separating these two components is important not only for an understanding of change, but also for developing accurate projections of future trends. First developed more than a half-century ago,⁶ the technique remains an important instrument in the toolbox for urban-economic analysis.

Let's consider how the technique can be applied to Vancouver's evolving economy.

⁶ The technique is usually credit to Edgar S. Dunn, Jr. (1960). “A Statistical and Analytical Technique for Regional Analysis.” *Papers and Proceedings of the Regional Science Association* 6, 97-112. In a footnote, Dunn narrates some of the older ideas that inspired the technique, as well as the sudden, simultaneous wave of innovation that happened in regional analysis in the late 1950s. Dunn's ideas drew on very preliminary versions developed by one of the staff members working in one of the institutions of the short era of “central planning” in the United States – the National Resources Planning Board, in the early 1940s. By the end of the 1950s, however, as Dunn's article appeared, so did broadly similar approaches by Victor Fuchs, Wilbur Zelinsky, and Robert Lichtenberg.

We begin with a simple table comparing employment figures for Vancouver and Canada across the sixteen broad industrial sectors used in the North American Industrial Classification System (NAICS) (see the table below).

Total Employment by Industrial Sector, Vancouver CMA and Canada, 1987 and 2000.

	Canada			Vancouver CMA		
	1987	2000	pct change	1987	2000	pct change
Agriculture	517,600	386,500	-25.33	8,000	9,900	23.75
Forestry, Fishing, Mining, Oil, and Gas	342,400	339,300	-0.91	9,000	6,600	-26.67
Utilities	122,800	122,700	-0.08	6,400	5,000	-21.88
Construction	878,100	953,500	8.59	44,000	53,600	21.82
Manufacturing	2,241,100	2,443,700	9.04	82,900	113,900	37.39
Trade	2,174,600	2,512,300	15.53	137,400	157,100	14.34
Transportation and Warehousing	700,600	813,700	16.14	60,100	71,000	18.14
Finance, Insurance, Real Estate, and Leasing	806,100	882,900	9.53	56,000	79,500	41.96
Professional, Scientific, and Technical Services	518,100	1,011,300	95.19	48,800	92,900	90.37
Management, Administrative, and Other Support	315,200	643,100	104.03	23,100	40,200	74.03
Educational Services	844,400	1,022,600	21.10	34,300	67,800	97.67
Health Care and Social Assistance	1,225,900	1,583,000	29.13	63,800	103,100	61.60
Information, Culture, and Recreation	529,500	736,000	39.00	40,200	66,700	65.92
Accommodation and Food Services	827,600	1,074,000	29.77	50,700	82,000	61.74
Other Services	693,800	744,900	7.37	41,900	53,600	27.92
Public Administration	823,700	799,600	-2.93	39,000	41,300	5.90
Total full- and part-time employment	13,561,500	16,069,100	18.49	745,600	1,044,200	40.05

Source: Statistics Canada (2003). *Labor Force Survey, monthly and annual releases*. Ottawa: Statistics Canada.

The Mix Effect: The mix effect for each sector is computed by multiplying the sector's Vancouver employment total at the beginning of the time period (in this case, 1987) by the difference between the national growth rate for the sector and the *national growth rate for all activities*. So, for the case of manufacturing, we first find out the difference between national and Vancouver growth rates:

- (a) national growth rate for manufacturing: 9.04%
 - (b) national growth rate for all activities: 18.49%
- 0.0904 minus .1849 = -0.0945

The difference of -0.0945 is a measure of how manufacturing lagged the performance of all activities nationally. Vancouver's mix effect for manufacturing is:

$$\text{mix effect} = (\text{Vancouver manufacturing employment in 1987}) \times -0.0945$$

$$-7,834 = 82,900 \times -0.0945$$

This means that, given Vancouver's economic profile in 1987, if manufacturing had performed on par with national trends, the region would have seen a *relative loss of 7,834 jobs* due to this sector. Although the sector grew at the national level, it grew slower than total employment, and thus comprised a shrinking share of all jobs. Metropolitan areas with a "mix" of industries dominated by slow-growth industries, therefore, are vulnerable to relative job losses. Vancouver's manufacturing operations, however, performed far better than manufacturing at the national level; and so we also have to consider the "local growth" effect.

The Local Growth Effect: The local growth effect for each activity is computed by multiplying the sector's Vancouver employment in 1987 by the difference between local and national growth rates *for that same activity*:

- (a) local growth rate for manufacturing: 37.39%
 - (b) national growth rate for manufacturing: 9.04%
- .3739 minus 0.0904 = .2835

Vancouver gained manufacturing employment at a much more rapid pace than the national rate. The local growth rate for manufacturing for the Vancouver region is:

$$\text{local growth effect} = (\text{Vancouver manufacturing employment in 1987}) \times -0.2835$$

$$23,502 = 82,900 \times 0.2835$$

The table below summarizes the mix effect, the local growth effect, and the combined effects for the sixteen major industrial sectors in the Vancouver CMA between 1987 and 2000; note that the figures below will differ slightly from the calculations above, because of very small rounding errors.

Shift-Share Analysis of Vancouver Employment, 1987-2000.

	Mix effect	Local growth effect	Combined effects
Agriculture	-3,506	3,926	421
Forestry, Fishing, Mining, Oil, and Gas	-1,746	-2,319	-4,064
Utilities	-1,189	-1,395	-2,583
Construction	-4,358	5,822	1,464
Manufacturing	-7,834	23,506	15,671
Trade	-4,069	-1,637	-5,706
Transportation and Warehousing	-1,411	1,198	-213
Finance, Insurance, Real Estate, and Leasing	-5,019	18,165	13,145
Professional, Scientific, and Technical Services	37,431	-2,355	35,077
Management, Administrative, and Other Support	19,759	-6,931	12,829
Educational Services	896	26,261	27,158
Health Care and Social Assistance	6,788	20,715	27,503
Information, Culture, and Recreation	8,244	10,822	19,067
Accommodation and Food Services	5,720	16,205	21,925
Other Services	-4,662	8,614	3,952
Public Administration	-8,352	3,441	-4,911
Totals	36,695	124,040	160,734

Vancouver enjoyed a substantial inward shift of jobs from other parts of the country, reflecting the simultaneous trends of changing industrial structures (the shift from primary industries and manufacturing to services and information-intensive activities) and the acceleration of growth in Western Canada.⁷ Note that Vancouver posted relative gains in the combined effects for eleven industrial sectors, but two-thirds of the entire inward shift can be traced to four sectors:

⁷ Jim Simmons and Larry McCann (2000). "Growth and Transition in the Canadian Urban System." In Trudi Bunting and Pierre Filion, eds., *Canadian Cities in Transition: the Twenty-First Century*. Second Edition. Don Mills, ON: Oxford University Press, 97-120.

professional, scientific, and technical services; health care and social assistance; educational services; and accommodation and food services. All of these gains conform to theories of 'post-industrial' economic transformations⁸ and the effects of broad demographic trends (the aging of the postwar baby boom generation and the entry of the 'echo' boom cohort into their early twenties) on health care and educational employment.⁹ It is also unsurprising to see relative

Mix Effect: the consequences of a particular pattern of specialization for a region's growth or decline. Regions specializing in slow-growth activities will have negative mix effects, and regions specializing in fast-growing activities will have positive mix effects.

Local Growth Effect: the consequences of differences between a local activity and *the same activity* at the national scale.

losses in forestry, fishing, mining, oil, and gas -- due to the combined effects of international competition and the use of more capital-intensive technologies that reduce the number of workers required to achieve the same level of output.¹⁰ Yet other aspects of Vancouver's changing employment structure are somewhat surprising. The region enjoyed substantial mix-effect gains by virtue of its disproportionate share of high-level professional and management service sectors -- activities tied into the emergence of "command and control" nodes in a global hierarchy of "world cities";¹¹ but employment in Vancouver's professional services and business support industries actually lagged behind nationwide growth rates, implying either that the region was losing out in global-city competition, or that the local sector minimized employment growth through the application of labor-saving technologies.¹²

Viewed as a whole, however, the shift-share analysis reveals a pattern of vibrant growth and regional change, as Vancouver benefits from the combined national trend towards metropolitan consolidation and westward growth. More than three quarters of the total inward shift results from the local growth effect across different industrial sectors, reflecting the healthy performance of newly-established enterprises in this part of Canada as well as the relocation and expansion of firms from elsewhere in the province, from the prairies, or from the dense urban corridor between Quebec City and Windsor.¹³

⁸ John N.H. Britton, ed. (1996). *Canada and the Global Economy: Structural and Technological Change*. Montreal and Kingston: McGill-Queen's University Press; William J. Coffee (2000). "Canadian Cities and Shifting Fortunes of Economic Development." In Trudi Bunting and Pierre Filion, eds., *Canadian Cities in Transition: the Twenty-First Century*. Don Mills, ON: Oxford University Press, 121-150; Peter Dicken (1998). *Global Shift*. New York: Guilford.

⁹ David Foot and D. Stoffman (1996). *Boom, Bust, and Echo*. Toronto: Macfarlane Waltern and Ross.

¹⁰ Roger Hayter (1996). "Technological Imperatives in Resource Sectors: Forest Products." In Britton, *Canada and the Global Economy*, 101-122; see also Coffee, "Canadian Cities and Shifting Fortunes," pp. 122-123.

¹¹ John Friedmann (1986). "The World City Hypothesis." *Development and Change* 17(1), 69-83; Saskia Sassen (1994). *Cities in the World Economy*. Thousand Oaks, CA: Sage Publications.

¹² R. Keith Semple (1996). "Quaternary Places in Canada." In Britton, *Canada and the Global Economy*, 97-120.

¹³ Simmons and McCann, "Growth and Transition."

Now things get interesting. Consider the experience of Detroit, often considered the urban icon of the large industrial corporate form -- the 'Fordist' city created by large, vertically-integrated companies generating lots of local forward and backward linkages with plenty of multiplier effects and circular and cumulative causation. That "virtuous circle" of self-propelling growth observed in the first half of the twentieth century, however, subsequently became a "vicious circle" for many Fordist cities, however, as new frontiers of industrial development in cheaper locations in the national and global periphery have undermined the competitive position of expensive North American production sites. We have to contend with some measurement differences (many U.S. historical data are still based on the outdated "Standard Industrial Classification" or SIC) but the broad trends are quite clear.

Total Nonfarm Employment by Industrial Sector, Detroit PMSA and the U.S., 1987 and 2000.

	United States			Detroit PMSA		
	1987	2000	pct change	1987	2000	pct change
Mining, agricultural services, forestry, and fishing	2,421,800	2,962,200	22.31	19,642	23,529	19.79
Construction	6,944,800	9,604,300	38.29	80,508	126,399	57.00
Manufacturing	19,548,800	19,106,900	-2.26	464,705	469,651	1.06
Transportation and public utilities	6,111,900	8,247,100	34.94	92,143	109,909	19.28
Wholesale trade	6,317,400	7,584,900	20.06	110,914	138,033	24.45
Retail trade	21,472,900	27,344,100	27.34	364,408	417,675	14.62
Finance, insurance, and real estate	10,399,500	13,495,100	29.77	168,466	194,444	15.42
Services	33,928,300	53,276,700	57.03	588,740	857,083	45.58
Federal civilian	3,088,000	2,891,000	-6.38	31,800	31,154	-2.03
Federal military	2,833,000	2,075,000	-26.76	16,257	9,813	-39.64
State government	4,077,000	4,952,000	21.46	32,757	36,579	11.67
Local government	9,998,000	12,823,000	28.26	159,075	175,638	10.41
Total Nonfarm Employment	127,141,400	164,362,300	29.28	2,129,415	2,589,907	21.63

Source: U.S. Bureau of Economic Analysis (2002). *Regional Economic Information System, 1969-2001*.
Washington, DC: U.S. Department of Commerce.

Shift-Share Analysis of Detroit Employment, 1987-2000.

	Mix effect	Local growth effect	Combined effects
Mining, agricultural services, forestry, and fishing	-1,367	-496	-1,863
Construction	7,262	15,061	22,322
Manufacturing	-146,548	15,451	-131,097
Transportation and public utilities	5,215	-14,424	-9,209
Wholesale trade	-10,217	4,866	-5,351
Retail trade	-7,043	-46,371	-53,414
Finance, insurance, and real estate	828	-24,169	-23,341
Services	163,388	-67,400	95,988
Federal civilian	-11,338	1,383	-9,956
Federal military	-9,109	-2,094	-11,203
State government	-2,559	-3,208	-5,768
Local government	-1,622	-28,385	-30,007
Totals	-13,111	-149,787	-162,899

Between 1987 and 2000, Detroit endured an outward shift of 163 thousand jobs, a relative loss that is almost identical to the *inward shift* enjoyed by Vancouver. Vancouver's gain, to be sure, is more pronounced than Detroit's relative loss (note that the latter's total employment is more

than twice as large as the former's), but trends in specific sectors point to a difficult transition in older American industrial centers. The benefits of a service sector that was already quite large in the 1980s (note the mix effect of 163 thousand) were almost completely wiped out by the vulnerability of the region's large manufacturing sector -- despite the surprising ability of the region to eke out a slight increase in manufacturing jobs in a time of turbulent industrial

Vancouver and Detroit: From the late 1980s through the 1990s, Vancouver enjoyed a "job surplus" of more than 160 thousand compared to the rest of Canada. Detroit suffered a "job deficit" of more than 160 thousand compared to the rest of the United States.

transformation. Stagnation in the regional production economy, and painful waves of layoffs in the recession of the early 1990s, also hit other industries through weakened local multiplier effects and severed backward linkages -- which were, increasingly, being relocated to lower-cost locations.¹⁴ Yet it is also important to emphasize that the spatial extent of the Detroit PMSA (Primary Metropolitan Statistical Area) obscures wide disparities in employment, job growth, and job quality between the city and suburban areas. The PMSA includes six large counties in

Southeastern Michigan, encompassing wealthy suburbs, edge cities, and new manufacturing plants around an older urban core of aging factories and deteriorating neighborhoods. The metropolitan expansion of manufacturing employment by 1.1 percent, therefore, conceals a great deal of internal sorting that has come at the expense of the region's older central core. Over the course of two decades, this spatially selective deindustrialization created a vacuum in the city housing and land markets that finally attracted a trickle of reinvestment into the core towards the end of the 1990s.¹⁵ The place has also shared the experience of many regions losing jobs due to military base closings, public agency retrenchment, and the privatization of government functions through subcontracting.¹⁶ All of these long-term forces of change were intensified in the global financial crisis of 2008, which pushed Detroit-headquartered automakers to the brink of bankruptcy and forced painful adjustments and job losses.

The changing employment structures of Detroit and Vancouver reflect a variety of powerful processes at multiple scales. Both cities are shaped by, and participate in, increasingly complex global flows of goods, ideas, people, and capital. Detroit-based manufacturers that dominated U.S. export markets now operate in, and are owned by investors in, dozens of countries, and in turn Detroit enterprises are restructuring their operations domestically¹⁷ and internationally with changing spatial divisions of labor. By the end of the 1980s, the Detroit area was the third most important parent location for foreign-controlled corporations in Canada, after London and New York.¹⁸ When banks and other financial corporations are removed, Detroit steps into the top spot, with manufacturing subsidiaries (most of them operating in the corridor between Windsor

¹⁴ James M. Rubenstein (1992). *The Changing U.S. Auto Industry*. London: Routledge.

¹⁵ P. Dixon and D. Solomon (1997). "Motown Rebound: Detroit Sees \$5.74 Billion in New Investments." *Detroit Free Press*, April 15, A1.

¹⁶ Geoffrey DeVerteuil, Woobae Lee, and Jennifer Wolch (2002). "New Spaces for the Local Welfare State? The Case of General Relief in Los Angeles County." *Social & Cultural Geography* 3(3), 229-246.

¹⁷ Rubenstein, *Changing Auto Industry*; see also James M. Rubenstein (2003). *The Cultural Landscape, Seventh Edition*. Upper Saddle River, NJ: Prentice-Hall, p. 364.

¹⁸ Semple, "Quaternary Places."

and Quebec city) posting revenues of \$47 billion in 1989.¹⁹ For its part, Vancouver's expansion is fueled by domestic relocations from the eastern 'core' of the Canadian urban system as well as older established international linkages with Britain and the United States, and newer, ever stronger ties with Asia. Significant portions of the region's employment base, and substantial chunks of the urban fabric, are woven into transnational networks of construction, investment, and migration.²⁰



Engine of the Fordist City: Ford Motor Company River Rouge Plant, Dearborn, Michigan, July 2010 (Elvin Wyly). The River Rouge is a small tributary that enters the Detroit River southwest of the present-day downtown core (visible in the far distance at the top of the image). Henry Ford established a plant that built ships for the U.S. Navy here during the First World War. Ford's automobile production was centered elsewhere, at a plant in Highland Park just north of the Detroit city boundary. Beginning in 1913, the Model T plant revolutionized manufacturing with the moving assembly line, the fragmentation of craft-labor into simpler and quicker repetitive tasks, and Ford's clever decision to pay his workers a generous wage of \$5 per day. Productivity and high wages

¹⁹ Semple, "Quaternary Places," p. 367.

²⁰ Kris Olds (1998). "Globalization and Urban Change: Tales from Vancouver via Hong Kong." *Urban Geography* 19(4), 360-385.

advanced in tandem, providing lucrative growth for the company and allowing workers to purchase the products they built. The success of the system helped to establish the principle of linking productivity growth to wage increases, and the concentration of thousands of workers in single plants, and networks of tens of thousands of workers in plants scattered across the city, made Detroit the epicenter of labor union organizing. Unions achieved notable successes in the 1930s, thanks in large part to New Deal legislation recognizing workers' rights to bargain collectively; bitter strikes and negotiations through the 1930s and then after the Second World War culminated in the "Treaty of Detroit" in 1948, which "made auto workers the nation's blue collar elite, enjoying generous benefits and guaranteed wage increases. ... their benefits became a model for the demands of other unions around the country. When employers agreed to these demands, millions of blue-collar Americans and their families were shifted from hovering just above the poverty line into the prosperous middle class." (Reynolds Farley, Sheldon Danziger, and Harry J. Holzer [2000]. *Detroit Divided*. New York: Russell Sage Foundation, p. 7.)

Ford's expansion led the company to shift production from Highland Park to a new plant here at River Rouge, combining the ideas of the Model T assembly line with newer principles of **vertical integration**. Vertical integration describes a situation in which a firm takes ownership of many stages of the production process, in order to maintain control over costs and quality. At River Rouge, Ford didn't just put cars together -- the firm brought in coal and iron ore, made steel, fabricated all kinds of parts, and exercised tight control over every part of the production process. Coal, iron ore, and other raw materials came in one side of River Rouge, and shiny new automobiles rolled off the assembly line on the other side. The productivity and efficiency of the system represented the highest achievement of Fordism, dominating manufacturing from the 1940s until the early 1970s. At that point the fundamental weakness of the system was exposed: owning all stages of the production process was great for maintaining control, but it became horrendously expensive when market demand became uncertain, or market tastes began to shift more quickly. The system was not designed to survive repeated worker layoffs or quick reconfigurations of the product line. These conditions emerged forcefully in the 1970s, and destroyed many of the firms that relied on vertical integration. The uncertainty also threatened the assumptions of labor-management agreements, steadily weakening the power of unions. To survive, firms had to pursue vertical **disintegration** -- divesting fully-owned subsidiaries and putting various activities out to bid among independent contractors (more and more of them non-unionized). Contracts would specify the terms and timing of the delivery of various components to be supplied by a contractor -- and would also make it clear that the order could be canceled on short notice if market demand declined. The risks of market uncertainty could thus be shifted to subcontractors, and, increasingly, to their workers who enjoyed reduced job security and reduced wages. The U.S. automobile industry went through a painful restructuring in the 1970s and 1980s, as old forms of vertical integration were replaced with more flexible -- and more contingent and uncertain -- subcontracting networks. The dramatic technological advances of Japan's "just-in-time" subcontracting processes were widely adopted by U.S.-based firms, and used in the new factories Japanese automakers established around the world, especially in "right-to-work" states in the U.S. South that made it much harder for unions to organize workers. Ford moved quickly to globalize its operations and develop sophisticated transnational subcontracting networks in order to survive. But the River Rouge plant is still there, and in the summer of 2010 it was still operating, although substantially below capacity. One of the lots in the distance was half-full with shiny new F-150 pickup trucks.

Your Job

I would like you to choose one or more metropolitan areas, examine the changing economic structure(s) with the shift-share technique, and to interpret the results. In other words, crunch a few numbers and tell a geographical story that helps us understand the changes documented in those numbers. Use this background paper as one model for how to interpret the shift-share results: draw on theories discussed in class, the readings, and additional research sources to shed light on the national and local processes behind the figures documented in your tables. Draw on a variety of outside sources -- scholarly books and articles, government planning documents, and articles from major newspapers and magazines.²¹

²¹ It's also a good idea to look "inside" the broad industrial categories, to get a sense of the specific kinds of industries in a particular place, when you're trying to understand a particularly extreme local growth or mix effect.

1. Choose your study area, assemble the data, and construct the shift-share tables

Your first step is to construct appropriate versions of the first two tables shown in this background paper to evaluate changes in relation to national trends for your chosen metropolitan area(s). You are free to choose any city or metropolitan area, so long as you can find the right kind of data to perform the shift-share analysis. If you choose to study a metropolitan area in the United States, you can copy the employment data from any of several worksheets I've compiled from U.S. Department of Commerce files, available on the Geog 350 projects page. One of these worksheets includes data for several hundred metropolitan areas in 1987 and 2000:

<http://www.geog.ubc.ca/~ewyly/g350/metrodat.xls>

Sheet 1 in this workbook includes the data for all metropolitan areas. Sheet 2 presents the shift-share calculations I used for part of this background paper. Be very careful if you choose to cut and paste these formulas: make sure you understand what the formulas are doing before trying to insert your own data. If you don't understand the formulas in Excel, do the calculations by hand.

There are several other datasets available on the projects page, including Canadian employment data from the Labour Force Survey. You can also get more specialized data directly from CANSIM, the Canadian Socioeconomic Information Management system, and browsing by subject under the 'Labour' heading, to find the Labour Force Survey. See the links I've posted on the course projects page.²²

Be original, and be creative. This means that if you choose to study Vancouver, you must do something different than what I've shown in the example above. Choose another metropolitan area (not Detroit), and undertake a comparative analysis of the contrasts between Vancouver's experience to that of another place; or choose a significantly different time period that will allow you to examine Vancouver in a way that does more than simply replicate what I've shown above.

2. Interpret the results

Consult a variety of sources to explain and interpret the results of your shift-share analysis. First, begin by scrutinizing your findings in light of the economic-development sections of either *Canadian Cities in Transition*, or Knox and McCarthy's *Urbanization*. How do your results line up with the predictions of staples theory, economic base theory, tertiarization and

For useful background information on the North American Industrial Classification System, see <http://www.census.gov/epcd/www/naics.html>. For information on the Standard Industrial Classification (SIC, the old system used by the US until March, 2003) see <http://www.census.gov/epcd/www/sichist.htm> and <http://www.census.gov/epcd/www/siclist.txt>

²² As a general recommendation, you're better off choosing a larger metropolitan region rather than a smaller one. In small towns, one or more industrial sectors may be dominated by a single large firm. If this is the case, then government statistical agencies typically will not disclose the employment totals for that sector, because doing so would allow corporate competitors to obtain valuable proprietary information about a firm's practices. Suppressed values like this usually show up in a data worksheet as "D" values. It is sometimes possible to work around "D" values for a shift-share analysis, but it gets tricky if there is more than one suppressed value.

professionalization, and circular and cumulative causation? Second, consider a few of the supplemental materials referenced in the syllabus, and/or other books and academic articles in urban-oriented journals (prominent examples include *Urban Geography*, *Urban Studies*, the *Canadian Journal of Regional Science*, the *Journal of Urban Affairs*, and *Urban Affairs Review*, but there are dozens of others). If you're studying a Canadian city, I highly recommend Ted Rutland and Sean O'Hagan's study: they review the history of economic base theory and methods similar to those described in this background paper, and then they marshal evidence to

Shift-Share Analysis and Policy:

Mix effects are the legacy of historical geography: it is important to understand and consider mix effects, but they cannot be changed by short-term policy. Policy interventions can only change local growth effects -- cancelling out a negative mix effect, or reinforcing a positive mix effect.

suggest that the central assumption of shift-share analysis and economic base theory -- that urban economic growth derives from export-driven specialization -- may be changing. Their evidence suggests that Canadian cities are gradually becoming more similar in their employment profiles over time, even as most cities are enjoying fairly healthy economic growth: the strong implication is that while in a previous generation growth required specialization and exports, in today's more service-intensive urban economies, it is entirely possible to pursue economic development strategies that are premised on local demand factors.²³

If you're studying a metropolitan area in the United States, then you should read Ann Markusen's fascinating paper. Like Rutland and O'Hagan, Markusen believes that local economic development planners pay too much attention to export activities, and that they are too reliant on indicators of concentration to infer export intensity. Markusen suggests that occupations provide a better lens on contemporary urban economies, and that some occupations that tend to be concentrated in some metropolitan areas are actually tied to locally-oriented service activities. This has considerable implications for economic development policy:

“Economic, political, cultural and environmental distinctiveness may attract high quality workers and firms as well as reflect a region's export viability. We hypothesize that local consumption activity can be a source of such distinctiveness and thus of long-term growth and stability and that specialization does not reflect export activity alone. Using skewness across metro regions in the US as a distinctiveness measure, we show that some occupations are more lopsided in their distribution than others. Since some highly skewed occupations like health care support workers and artists, media, entertainment and sports workers are known to be chiefly local-serving, their regional significance can be attributed to variations in residents' local consumption spending rather than export demand. We conclude that economic development practitioners should weigh the considerable investments, including subsidies and tax incentives, made

²³ Ted Rutland and Sean O'Hagan (2007). “The Growing Localness of the Canadian City, or, On the Continued (Ir)relevance of Economic Base Theory.” *Local Economy* 22(2), 163-185.

in wooing and retaining presumptive export base activities against those that might target distinctive local consumption activities.”²⁴

Third, draw on local government planning documents and articles in the local press of your chosen metropolitan area. One approach is to enter the name of your metropolitan area along with relevant terms like employment, deindustrialization, service sector, manufacturing, business services, industrial restructuring, etc., into either the Lexis-Nexis news database, or the Canadian Newsstand collection. See the links on the course projects page.

Look for discussions and analyses of changing economic conditions, coverage of major corporate restructuring or government policies, and local debates over the consequences of growth and decline for other industries.

3. Draft a paper reporting your findings

Finally, you should draft a paper interpreting your findings. You should consider several kinds of questions. How did your metropolitan economy perform in relation to national trends? What are the broad historical-geographical factors that explain the performance and changing industrial structure of your chosen metros? Are they dying, Fordist metropoli, or thriving globalized postindustrial service and consumption centers? What role do you recommend for public policy, and why? Should certain industries be targeted for special assistance because they are having a hard time? Should public officials accept the theory that the death of old-line manufacturing industries is inevitable? If so, what strategy do you recommend to recruit new companies in those fast-growing (but perhaps risky and volatile) economic sectors? If not, what approach do you recommend to preserve existing jobs while pursuing new ones?

Any information that is not your own should be cited as a reference in your paper (I recommend footnotes). Plagiarism is something that should not even cross your mind: I’m interested in your creativity and insight as you interpret the manifestation of economic and industrial change in a particular place. Your paper should include approximately 1,500 words of analysis and interpretations; tables, graphs, maps, references, and any other material in footnotes or endnotes do not count against this word limit. Do not forget to include, at a minimum, the basic employment and shift-share tables as shown above. You are also encouraged to prepare other tables or figures to illustrate your analysis and interpretations.

Other Examples and Ideas

The shift-share technique presented above is only the simplest possible approach, and thus I encourage innovation. For example, you can use different time periods, replacing the broad view between 1987 and 2000 with a more fine-grained portrait, say, of the devastating recession of 2008-2009. You can also change the *context* -- comparing a city’s performance to a state or region rather than an entire nation. Or you can make things very interesting, by shifting the focus from industries to another aspect of urban economic change -- such as *occupations*. For an illustration, let’s consider Detroit’s changing occupational profile in the last few years:

²⁴ Ann Markusen and Greg Schrock (2008). “Consumption-Driven Urban Development.” Forthcoming, *Urban Geography*.

Total Employment by Major Occupational Group, Detroit and the United States.

	United States			Detroit, MI PMSA		
	2000	2004	pct change	2000	2004	pct. Change
Management Occupations	7,782,680	6,200,940	-20.32	96,600	86,970	-9.97
Business and Financial Operations Occupations	4,619,270	5,131,840	11.10	105,360	107,230	1.77
Computer and Mathematical Occupations	2,932,810	2,915,300	-0.60	47,810	48,580	1.61
Architecture and Engineering Occupations	2,575,620	2,372,770	-7.88	106,460	85,610	-19.58
Life, Physical, and Social Science Occupations	1,038,670	1,131,390	8.93	17,510	11,780	-32.72
Community and Social Services Occupations	1,469,000	1,673,740	13.94	21,210	17,410	-17.92
Legal Occupations	890,910	958,520	7.59	5,610	14,420	157.04
Education, Training, and Library Occupations	7,450,860	7,891,810	5.92	92,650	101,930	10.02
Arts, Design, Entertainment, Sports, and Media Occupations	1,513,420	1,595,710	5.44	24,550	25,950	5.70
Healthcare Practitioners and Technical Occupations	6,041,210	6,359,380	5.27	98,750	96,220	-2.56
Healthcare Support Occupations	3,039,430	3,271,350	7.63	51,000	49,600	-2.75
Protective Service Occupations	3,009,070	3,006,100	-0.10	47,460	41,210	-13.17
Food Preparation and Serving Related Occupations	9,955,060	10,507,390	5.55	131,250	157,200	19.77
Building and Grounds Cleaning and Maintenance Occupations	4,318,070	4,300,440	-0.41	64,730	55,870	-13.69
Personal Care and Service Occupations	2,700,510	3,099,550	14.78	50,090	48,240	-3.69
Sales and Related Occupations	13,506,880	13,507,840	0.01	216,950	209,790	-3.30
Office and Administrative Support Occupations	22,936,140	22,649,080	-1.25	334,900	324,430	-3.13
Farming, Fishing, and Forestry Occupations	460,700	458,850	-0.40	860	920	6.98
Construction and Extraction Occupations	6,187,360	6,170,410	-0.27	84,550	77,640	-8.17
Installation, Maintenance, and Repair Occupations	5,318,490	5,215,390	-1.94	79,960	81,230	1.59
Production Occupations	12,400,080	10,128,200	-18.32	275,000	202,660	-26.31
Transportation and Material Moving Occupations	9,592,740	9,581,320	-0.12	148,860	143,880	-3.35
Totals	129,738,980	128,127,320	-1.24	2,102,120	1,988,770	-5.39

Source: U.S. Bureau of Labor Statistics (2005). Occupational Employment Statistics. Washington, DC: U.S. Department of Labor.

Note that Detroit lagged the national growth rate by 4.15 percent during these years, which when applied against the region's total job base in 2000 yielded an outward shift of more than 87 thousand jobs. How did these relative job losses affect different workers -- blue-collar assembly-line workers, or middle-management office workers, or other service workers in the region's economy? The shift-share analysis on the next page sheds light on the painful recession and restructuring. Four-fifths of the relative job losses hit workers in production occupations, while forward and backward linkages to firms employing engineers (in the Architecture and Engineering category) also took a severe toll (combined effects of nearly 20 thousand). The bright spots in the region's economy include education and training occupations (reflecting a longstanding pattern in all economies where recessions lead those who can opt to stay in school a bit longer to do so, while some laid-off workers may be able to secure loans or grants to pursue retraining opportunities), and food service and food preparation. Given the contingent, low-wage, and part-time nature of most food service work, these trends are not encouraging.

Occupational Shift-Share, Detroit, 2000-2004.

	Mix Effect	Local Growth Effect	Combined Effects
Management Occupations	-18,433	10,003	-8,430
Business and Financial Operations Occupations	13,000	-9,821	3,179
Computer and Mathematical Occupations	308	1,055	1,364
Architecture and Engineering Occupations	-7,062	-12,465	-19,528
Life, Physical, and Social Science Occupations	1,781	-7,293	-5,512
Community and Social Services Occupations	3,220	-6,756	-3,537
Legal Occupations	495	8,384	8,880
Education, Training, and Library Occupations	6,634	3,797	10,431
Arts, Design, Entertainment, Sports, and Media Occupations	1,640	65	1,705
Healthcare Practitioners and Technical Occupations	6,428	-7,731	-1,303
Healthcare Support Occupations	4,525	-5,291	-766
Protective Service Occupations	543	-6,203	-5,660
Food Preparation and Serving Related Occupations	8,912	18,668	27,580
Building and Grounds Cleaning and Maintenance Occupations	540	-8,596	-8,056
Personal Care and Service Occupations	8,024	-9,252	-1,228
Sales and Related Occupations	2,710	-7,175	-4,465
Office and Administrative Support Occupations	-31	-6,279	-6,310
Farming, Fishing, and Forestry Occupations	7	63	71
Construction and Extraction Occupations	819	-6,678	-5,860
Installation, Maintenance, and Repair Occupations	-557	2,820	2,263
Production Occupations	-46,968	-21,956	-68,924
Transportation and Material Moving Occupations	1,672	-4,803	-3,131
Totals	-11,793	-75,443	-87,237

The data for this occupational shift-share comes from the Occupational Employment Survey of the Bureau of Labor Statistics, and Excel worksheets of data for several years can be found on the course projects page. The Occupational Employment Survey also includes information on the average hourly and annual wages for different occupational groups, allowing us to take a closer look at the rewards for different kinds of work (see the table on the next page). Note that nationwide, the highest occupational groups -- management and legal occupations -- had average hourly wages more than 4.2 times the hourly averages for the lowest-paid group, workers in food preparation and serving jobs. This gap expanded from 2000 to 2008, with uneven rewards to growth across different parts of the occupational distribution. When nationwide hourly wages are adjusted for inflation,²⁵ there is a clear partitioning between the occupational groups on the top rows of the chart, and those near the bottom; the former tend to require higher levels of education and formal credentials, while those near the bottom are usually described as 'unskilled.' (Such labels are often used in condescending ways, and they are often inaccurate, but it is nevertheless important to recognize the phrase.) Nationally, inflation-adjusted hourly wages shot up by 17.7 percent for management occupations, and by 12.3 percent for healthcare

²⁵ Since the cost of living generally increases over time, the value of a given amount of money will erode over time (unless you invest it somewhere it can earn interest). Each \$1.00 in the year 2008 was worth \$1.2503 in 2000; multiplying this factor by the average wage figures for 2000 allows us to create comparable measures of the purchasing power of the average earnings for each occupational group, using 'constant' 2008 dollars.

practitioners and technical occupations; significant if somewhat smaller increases were apparent across many other white-collar occupations, including business and financial operations, computer and mathematical sciences, architecture and engineering, legal, and life, physical, and social science occupations. But working-class jobs suffered inflation-adjusted losses: building and grounds cleaning and maintenance jobs, personal care and services, office and administrative support, installers and repairpersons, production occupations, and transportation-related occupations. These trends were exacerbated in Detroit, where production workers saw average hourly wages collapse by 10.1 percent, construction workers lost 10.7 percent, and personal care and services workers lost 17.3 percent.

Average Wages by Major Occupation Group, Detroit and U.S., 2000 and 2008

Major Occupation Group	United States						Detroit									
	2000			2008			2000			2008						
	Total Employment	Average (2000 dollars) Hourly	Average (2008 dollars) Annual	Total Employment	Average (2008 dollars) Hourly	Average (2008 dollars) Annual	Total Employment	Average (2000 dollars) Hourly	Average (2008 dollars) Annual	Total Employment	Average (2008 dollars) Hourly	Average (2008 dollars) Annual				
All Occupations	129,738,980	15.81	32,890	19.77	41,123	135,185,230	20.32	42,270	2,102,120	18.65	38,795	23.32	48,505	1,915,010	22.45	46,700
Management occupations	7,782,680	32.78	68,190	40.99	85,258	6,152,650	48.23	100,310	96,600	40.90	85,060	51.14	106,351	82,750	50.58	105,200
Business and financial operations occupations	4,619,270	23.30	48,470	29.13	60,602	6,135,520	31.12	64,720	105,360	27.50	57,210	34.38	71,530	104,630	33.45	69,570
Computer and mathematical science occupations	2,932,810	27.91	58,050	34.90	72,580	3,308,260	35.82	74,500	47,810	28.03	58,310	35.05	72,905	57,520	35.25	73,320
Architecture and engineering occupations	2,575,620	25.99	54,060	32.50	67,592	2,521,630	34.34	71,430	106,460	29.95	62,290	37.45	77,882	78,500	36.68 *	76,461 *
Life, physical, and social science occupations	1,038,670	22.97	47,790	28.72	59,752	1,296,840	30.90	64,280	17,510	20.79	43,240	25.99	54,063	12,070	31.30	65,100
Community and social services occupations	1,469,000	15.82	32,910	19.78	41,148	1,861,750	20.09	41,790	21,210	19.13	39,790	23.92	49,750	29,600	21.34	44,390
Legal occupations	890,910	33.14	68,930	41.44	86,184	1,003,270	44.36	92,270	5,610	32.56	67,710	40.71	84,658	14,540	47.20	98,180
Education, training, and library occupations	7,450,860	18.22	37,900	22.78	47,387	8,451,250	23.30	48,460	92,650	21.70	45,130	27.13	56,426	93,030	25.25	52,530
Arts, design, entertainment, sports, media occupations	1,513,420	18.58	38,640	23.23	48,312	1,804,940	24.36	50,670	24,550	24.67	51,310	30.85	64,153	25,860	25.03	52,070
Healthcare practitioners and technical occupations	6,041,210	23.07	47,990	28.84	60,002	7,076,800	32.64	67,890	98,750	25.55	53,150	31.95	66,454	104,310	34.79	72,350
Healthcare support occupations	3,039,430	10.11	21,040	12.64	26,306	3,779,280	12.66	26,340	51,000	10.63	22,110	13.29	27,644	59,240	12.85	26,730
Protective service occupations	3,009,070	14.80	30,780	18.50	38,484	3,128,960	19.33	40,200	47,460	13.50	28,070	16.88	35,096	37,990	18.98	39,480
Food preparation and serving related occupations	9,955,060	7.72	16,070	9.65	20,092	11,438,550	9.72	20,220	131,250	8.14	16,930	10.18	21,168	153,460	9.81	20,400
Building, grounds cleaning and maintenance occupations	4,318,070	9.41	19,570	11.77	24,469	4,429,870	11.72	24,370	64,730	10.78	22,420	13.48	28,052	55,480	12.83	26,680
Personal care and service occupations	2,700,510	9.86	20,510	12.33	25,644	3,437,520	11.59	24,120	50,090	11.45	23,810	14.32	29,770	54,680	11.84	24,620
Sales and related occupations	13,506,880	13.46	27,990	16.83	34,996	14,336,430	17.35	36,080	216,950	14.82	30,820	18.53	38,534	204,930	18.52	38,520
Office and administrative support occupations	22,936,140	12.64	26,300	15.80	32,883	23,231,750	15.49	32,220	334,900	13.88	28,880	17.35	36,109	300,080	16.52	34,360
Farming, fishing, and forestry occupations	460,700	9.07	18,860	11.34	23,581	438,490	11.32	23,560	860	11.40	23,720	14.25	29,657	1,080 **	12.81	26,640
Construction and extraction occupations	6,187,360	16.56	34,440	20.71	43,061	6,548,760	20.36	42,350	84,550	22.31	46,400	27.89	58,014	57,630	24.91	51,800
Installation, maintenance, and repair occupations	5,318,490	16.23	33,760	20.29	42,210	5,374,850	19.82	41,230	79,960	19.30	40,140	24.13	50,187	73,320	22.95	47,740
Production occupations	12,400,080	12.72	26,450	15.90	33,071	9,919,120	15.54	32,320	275,000	17.51	36,420	21.89	45,536	182,390	19.68	40,930
Transportation and material moving occupations	9,592,740	12.32	25,630	15.40	32,045	9,508,750	15.12	31,450	148,860	14.10	29,320	17.63	36,659	131,920	17.11	35,590

Notes:

2000 wage figures inflated to 2008 values using the Consumer Price Index for all urban consumers: each \$1.00 in 2008 was worth \$1.2503 in 2000. See <http://ftp.bls.gov/pub/special.requests/cpi/cpiapi.txt>

*Wage estimate suppressed by BLS; inferred by summing employment * wage totals for all other occupations, and subtracting from total employment * wage product.

**Employment estimate suppressed by BLS; inferred by summing all other occupations, and subtracting from total employment.

Source: U.S. Department of Labor (2001, 2009). Occupational Employment Statistics. Washington, DC: U.S. Department of Labor.

The shift-share technique allows us to distinguish the broad national trends in the workforce from the unique circumstances of occupations in Detroit. It is a simple matter to multiply the total employment for each occupational group by the average wages -- this time we'll use annual earnings, in order to highlight the broad consequences for total regional income. The result is a set of total annual earnings, broken down by occupational groups. Workers in the Detroit region earned \$89.43 billion in 2008, down from \$101.96 billion eight years earlier; during the same period, wages nationwide grew by 7.10 percent, to \$5.71 trillion in 2008. Detroit thus endured an outward shift of \$19.77 billion of annual earnings. Production occupations accounted for more than a quarter of this loss: the region had a heavy specialization in types of work that saw erosion in wages, and the region's occupations fared worse than their counterparts nationwide. Similar effects -- where a negative mix was accentuated by negative local growth -- were apparent not just for the blue- and pink-collar jobs we would expect (construction, transportation, office and administrative support, building and grounds cleaning and maintenance). The same effects also hit management occupations and architecture and engineering jobs. These findings represented a significant intensification of the deindustrialization process, during nearly a decade of broad economic growth. It is also crucial to recognize that Detroit's wage losses are no longer the product of an historical legacy of a certain kind of specialization: the mix effect accounts for only 3.3 percent of the outward shift of wage income. Negative local growth effects dominate, suggesting that a vicious cycle of self-reinforcing losses -- of jobs, profits, wages, or all three --

has become a permanent feature of the regional economy. Moreover, things soon got much worse: the occupational survey measures conditions in May of each year, and the global financial crisis began to spread through the summer of 2008, culminating in a catastrophic series of bank collapses in September and October that shook investor confidence and precipitated widespread job losses across nearly every major economy in the world.

Shift-Share Analysis of Total Wage Income, Detroit, 2000-2008

	Total Annual Wage Income (billions of 2008 dollars)						Shift-Share of Annual Wage Income (millions of 2008 dollars)		
	United States			Detroit			Mix	Local Growth	Combined
	2000	2008	pct. chg.	2000	2008	pct. chg.	Effect	Effect	Effects
Management occupations	663.54	617.17	-6.99	10.27	8.71	-15.26	-1,448	-850	-2,298
Business and financial operations occupations	279.94	397.09	41.85	7.54	7.28	-3.41	2,619	-3,411	-793
Computer and mathematical science occupations	212.86	246.47	15.79	3.49	4.22	20.99	303	182	484
Architecture and engineering occupations	174.09	180.12	3.46	8.29	6.00	-27.61	-302	-2,576	-2,878
Life, physical, and social science occupations	62.06	83.36	34.32	0.95	0.79	-17.00	258	-486	-228
Community and social services occupations	60.45	77.80	28.71	1.06	1.31	24.52	228	-44	184
Legal occupations	76.78	92.57	20.56	0.47	1.43	200.58	64	855	919
Education, training, and library occupations	353.07	409.55	16.00	5.23	4.89	-6.52	465	-1,177	-712
Arts, design, entertainment, sports, and media occupations	73.12	91.46	25.08	1.57	1.35	-14.50	283	-623	-340
Healthcare practitioners and technical occupations	362.49	480.44	32.54	6.56	7.55	15.00	1,669	-1,151	518
Healthcare support occupations	79.96	99.55	24.50	1.41	1.58	12.32	245	-172	73
Protective service occupations	115.80	125.78	8.62	1.67	1.50	-9.96	25	-309	-284
Food preparation and serving related occupations	200.02	231.29	15.63	2.78	3.13	12.68	237	-82	155
Building and grounds cleaning and maintenance occupations	105.66	107.96	2.18	1.81	1.48	-18.42	-89	-374	-463
Personal care and service occupations	69.25	82.91	19.73	1.49	1.35	-9.72	188	-439	-251
Sales and related occupations	472.69	517.26	9.43	8.36	7.89	-5.58	194	-1,254	-1,060
Office and administrative support occupations	754.21	748.53	-0.75	12.09	10.31	-14.74	-950	-1,691	-2,641
Farming, fishing, and forestry occupations	10.86	10.33	-4.90	0.03	0.03	12.80	-3	5	1
Construction and extraction occupations	266.43	277.34	4.09	4.91	2.99	-39.14	-148	-2,121	-2,268
Installation, maintenance, and repair occupations	224.50	221.61	-1.29	4.01	3.50	-12.78	-337	-461	-798
Production occupations	410.08	320.59	-21.82	12.52	7.47	-40.39	-3,622	-2,324	-5,947
Transportation and material moving occupations	307.40	299.05	-2.72	5.46	4.70	-13.96	-536	-614	-1,150
All Occupations	5,335.26	5,714.28	7.10	101.96	89.43	-12.29	-657	-19,120	-19,777

You are by no means limited to cities or metropolitan regions in North America. Depending on which country or region you choose to study, however, you will have to carefully consider changes in the definitions or classification systems used to measure employment. In China, for example, changes in classifications and definitions make it difficult to analyze the details of economic restructuring over long periods of time. Yet it is possible to document the dramatic growth of recent years (see the “Number of Employed Persons...” table below). Guangdong Province, which includes the broad patchwork of cities nestled along China’s southern Pearl River Delta, has become a truly remarkable export-processing center since the initiation of major national economic reforms in the late 1970s. The Pearl River Delta

“has successfully transformed itself from a backward rural region to become one of the world’s largest production bases of light manufacturing and a thriving extended or mega urban region. By the mid 1990s, a massive industrial corridor stretched for more than 100 km along the Guangzhou-Shenzhen Expressway ... Thousands of factories set up mainly by Hong Kong manufacturers employing more than 10 million migrant workers from all over the country have since then

churned out all kinds of consumption goods for the American and European Markets.”²⁶

Deindustrialization became a prominent theme in urban geography, urban planning, and economic development in Western Europe and North America after the 1970s. China’s contemporary transformation makes it clear how important it is to consider national and transnational context. Industrial change and patterns of growth and decline paint a picture of devastating deindustrialization when seen from the abandoned factories and empty streets of Detroit. Urban economic growth looks like a landscape devoted to consumption when viewed from the cluster of high-rise condominium towers and entertainment districts of downtown Vancouver. But when we remember how places like Detroit and Vancouver are bound together with other cities around the world in flows of investment, disinvestment, and trade, it is clear that uneven urban development has become a truly global phenomenon.

One facet of this uneven development involved a massive wave of industrial urbanization across China. Growth rates accelerated in the first decade of the twenty-first century, thanks to a confluence of forces: low interest rates, driven in part by China’s effort to protect export market shares by controlling its currency exchange rate, encouraged a massive expansion in consumer borrowing across North America and Western Europe. Particularly in the United States, the real-estate boom encouraged home-owning households to borrow against the rising market value of their homes, using the proceeds to buy consumption goods -- many of them manufactured in China. The most consumption-oriented upper-middle class suburbs of apparently “postindustrial” cities in North America became ever more tightly linked through circuits of trade and investment to the vast fabricating plants and assembly-line factories that have drawn millions of rural migrants into a rapidly-growing, contemporary industrial working class. The curious blend of dichotomy and dependence between postindustrial North American cities and newly-industrializing Chinese cities was mirrored by a “front shop/back factory” division in Guangdong. For thirty years, urban industrial growth in the region was driven in large part by a spatial division of labor between Hong Kong and the industrial cities of the delta. Design, management, and higher-level business services were concentrated in Hong Kong, while the routine, low-wage assembly-line work went to Guangdong, Shenzhen, and other cities on the mainland. At the peak, a total of 58,000 Hong Kong industrial firms had operations in the Pearl River Delta.²⁷

Employment estimates by industrial sector document the magnitude of these changes for Guangdong Province, not including the Special Administrative Regions of Macau and Hong Kong (see the two tables below). Between 2003 and 2007, employment in urban units (not including township and village enterprises and self-employed people) mushroomed at a rate three times the national pace. Across nineteen industrial sectors, only four showed absolute declines during this period: wholesale and retail trade, production and distribution of electricity and other utilities, mining, and agriculture. Growth flourished across most other sectors, including

²⁶ Si-ming Li (2009). *Economic Integration Between Hong Kong and the Pearl River Delta at a Crossroads: Mega-Urban Development Under One Country, Two Systems*. Occasional Paper No. 97. Hong Kong: Centre for China Urban and Regional Studies, Department of Geography, Hong Kong Baptist University, p. 9.

²⁷ Fiona Tam (2008). “South China Firms in Dire Need of Help.” *South China Morning Post*, 1 November, p. 3, cited in Si-ming Li, *Economic Integration*, p. 2.

manufacturing -- which increased by half in less than a decade, and comprised more than 40 percent of total employment. The growth profile is reminiscent of the shift from agriculture and other primary industries to secondary-sector manufacturing in the late nineteenth and early twentieth century in North America and Western Europe. Guangdong's industrialization boom brought a net inward shift of some 1.4 million jobs from the rest of China, the vast majority due to local growth effects that cannot be attributed solely to a beneficial industry mix. Manufacturing alone accounted for more than 1.1 million of the surplus jobs that reshaped life across the Pearl River Delta.

Number of Employed Persons in Urban Units at Year-End, by Industrial Sector, China and Guangdong Province, 2003 and 2007.

	China			Guangdong		
	2003	2007	pct. change	2003	2007	pct. change
Agriculture, Forestry, Animal Husbandry, and Fishing	4,845,000	4,263,000	-12.01	132,000	99,000	-25.00
Mining	4,883,000	5,350,000	9.56	40,000	34,000	-15.00
Manufacturing	29,805,000	34,654,000	16.27	2,838,000	4,230,000	49.05
Production and Distribution of Electricity, Gas, and Water	2,976,000	3,034,000	1.95	196,000	194,000	-1.02
Construction	8,337,000	10,508,000	26.04	546,000	601,000	10.07
Transport, Storage, and Post	6,365,000	6,231,000	-2.11	437,000	488,000	11.67
Information Transmission, Computer Service and Software	1,168,000	1,502,000	28.60	117,000	158,000	35.04
Wholesale and Retail Trade	6,281,000	5,069,000	-19.30	409,000	405,000	-0.98
Hotels and Restaurants	1,721,000	1,858,000	7.96	199,000	239,000	20.10
Financial Intermediation	3,533,000	3,897,000	10.30	282,000	324,000	14.89
Real Estate	1,202,000	1,665,000	38.52	145,000	239,000	64.83
Leasing and Business Services	1,835,000	2,472,000	34.71	156,000	264,000	69.23
Scientific Research, Technical Services, and Geological Prospecting	2,219,000	2,434,000	9.69	93,000	142,000	52.69
Water Management of Conservancy, Environment, and Public Facilities	1,725,000	1,935,000	12.17	112,000	129,000	15.18
Services to Households and Other Services	528,000	574,000	8.71	30,000	51,000	70.00
Education	14,428,000	15,209,000	5.41	924,000	1,032,000	11.69
Health, Social Securities, and Social Welfare	4,858,000	5,428,000	11.73	346,000	418,000	20.81
Culture, Sports, and Entertainment	1,278,000	1,250,000	-2.19	70,000	88,000	25.71
Public Management and Social Organization	11,710,000	12,912,000	10.26	739,000	881,000	19.22
Total employed persons in urban units	109,697,000	120,245,000	9.62	7,811,000	10,016,000	28.23

National Bureau of Statistics of China (2004, 2008). *China Statistical Yearbook, Employment and Wages*. Beijing: China Statistics Press.

Growth like this could not continue forever. Beginning in early 2007, some of the risky lending practices involved in the U.S. housing boom began to reach their limit, causing instability in many global financial markets. Over the course of the next year, a massive crisis began to undermine national banking systems, first in the United States, and then across Europe. With the collapse of the housing and debt boom, demand for export goods collapsed, and a wave of bankruptcies and factory closures spread across Guangdong province. As the global financial crisis worsened in the Fall of 2008, the Chairman of the Hong Kong Federation of Industries estimated that up to 2.5 million workers in the Pearl River Delta employed by Hong Kong factories could lose their jobs in the coming months.²⁸

²⁸ Si-ming Li, *Economic Integration*, p. 2.

Shift-Share Analysis of Guangdong Employment, 2003-2007.

	Mix effect	Local Growth Effect	Combined Effects
Agriculture, Forestry, Animal Husbandry, and Fishing	-28,549	-17,144	-45,693
Mining	-21	-9,826	-9,846
Manufacturing	188,826	930,283	1,119,110
Production and Distribution of Electricity, Gas, and Water	-15,027	-5,820	-20,847
Construction	89,680	-87,181	2,499
Transport, Storage, and Post	-51,220	60,200	8,980
Information Transmission, Computer Service and Software	22,207	7,543	29,750
Wholesale and Retail Trade	-118,250	74,922	-43,328
Hotels and Restaurants	-3,294	24,159	20,865
Financial Intermediation	1,938	12,946	14,884
Real Estate	41,910	38,147	80,057
Leasing and Business Services	39,153	53,846	93,000
Scientific Research, Technical Services, and Geological Prospecting	68	39,989	40,058
Water Management of Conservancy, Environment, and Public Facilities	2,865	3,365	6,231
Services to Households and Other Services	-271	18,386	18,115
Education	-38,831	57,983	19,152
Health, Social Securities, and Social Welfare	7,327	31,403	38,730
Culture, Sports, and Entertainment	-8,265	19,534	11,269
Public Management and Social Organization	4,797	66,144	70,941
Totals	135,047	1,318,880	1,453,927