The Challenge for Regional Development

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Introduction

As a new entrant in the 1960s into the field of what was to become regional economics, I was surprised to learn that one of the first studies to explore the spatial dimension of economic development was published in the early 1940s Full Employment in a Free Society. In this book, the author, Lord Beveridge, presented data on the spatial distribution of unemployment rates by region in the U.K. Readers were startled to find that during the Great Depression (1929-1937), unemployment rates varied by a factor of 2 or 2.5 times between SE UK (London-centered region) and Wales, Scotland and the North of England. The impact of the Depression was uneven over space; the Beveridge Report sought to understand the causes and the outcomes. In 2014, the differences persist although the unemployment rates vary from 5.3% in SE to 10.3% in Northeast, a difference is slightly less than 2 times. In the interim between the 1940s when "regional policy" began to take a formal role in economic growth and development strategy and the present day, we have witnessed some major changes in these policies, in the structure of regional economies, in the models that have been developed to help us understand regional dynamics and in our capacity to be humble enough to realize that the success of regional policy remains, for the most part, an aspiration yet to be realized.

Understanding a Regional Economy

In the regional development literature, intervention on the part of government is often justified as a way to correct market failures. There is a further, often unstated, belief that only spatially targeted government policies influence regional development; for a long time, this belief was also accompanied by a view that the loci of benefits from spatially targeted policies were the regions in which the investments were made. Consider the cases of the Northeast of Brazil and Irian Jaya in Indonesia, both the least prosperous of the macro regions in their respective countries. After several decades of targeted development investments, the gap in per capita income between these regions and their national levels has remained virtually unchanged. These findings have generated a great deal of introspection in regional development ministries in both countries; perhaps the targeted investments were not chosen correctly, or the regional development strategies that were chosen were inappropriate. These myopic perspectives anticipate a direct cause-effect relationship between targeted spatial

development strategy and outcomes but they fail to appreciate broader, system-wide structural effects often having nothing to do with explicit spatial development strategy that often serve to undermine the success of anticipated outcomes for targeted development policies. These system-wide effects are part of a set of characteristics of an economy that can be collectively referred to as *spatially blind policies*.

It is important to appreciate that the apparent tension between spatially blind and spatially targeted policies is rarely articulated in this fashion but it is also clear that the distinction provides important insights into the apparent lack of success of spatial development strategies in many countries, both developed and developing. In some ways, the outcome should not be unexpected given the enormous discrepancy in the size of funds allocated to spatially targeted investments as opposed to the rest of the investment portfolio of central governments. Further, spatially blind does not imply spatially neutral For example, the US federal government budget allocates about 20% of total spending and almost half of discretionary spending to defense; the defense expenditures are decidedly not spatially blind. Military installations and associated personnel are not spread evenly throughout the fifty states; further, defense procurement is decidedly concentrated but the total spatial impacts of these purchases is difficult to trace because of the complex web of supply chains associated with the production of final goods and services for the various parts of the defense establishment.

In many developing economies, spatial policies are often assigned to a prominent federal agency with a high profile with the concomitant belief that allocations assigned to other agencies will be spatially blind. Rarely has an integrated assessment of the impact of the *total* budget allocations been a prominent feature of the *ex ante* or *ex post* evaluation of the success of the spatial policies. In fact, it would be fair to state that this is a feature of spatial development strategy that has rarely been addressed. Far more attention has been focused on the rationale for the policies – import substitution industrialization, key sector identification, growth poles and growth centers, cluster development and so forth. Given the sheer magnitude of the non-spatially targeted components of central government budgets, it would be more of a surprise if they did not have a more profound impact on spatial development. Yet, in so many of the evaluations of the success (or failures) of policy promoting convergence, attention has rarely been directed outside the purview of the spatially-targeted policies while it is entirely possible that the spatially blind allocations may end up either unraveling the benefits of the spatial policies or even generating countervailing tendencies.

Regional Competition but what about Regional Complementarity?

In addition, too often, regional development policies have essentially been dominated by regional competition policies. Attention is directed to ways of enhancing a region's competitive position through strategic investments in infrastructure, human capital or targeted investments in key industries. This strategy ignores the fact that as a result of fragmentation forces, in which firms have reorganized production processes by breaking them into more specific tasks that are allocated to individual establishments to exploit the advantages of economies of scale within an individual plant and economics of scope across multiple establishments. The production of value chains are often spread across multiple regional economies that are often located in different economies. For example, the average component in a US automobile crosses between two and three state (region) lines before ending up in the final product. Hence, regions are becoming more complementary as evidenced by the significant increase in interregional trade while regional policy only focuses on the competitive dimension. Most of this interregional trade is heavily concentrated in intra-industry trade (movement between similar sectors) providing further evidence of the increasing tendency towards fragmentation.

Trade Policies: National Initiative but Spatially Distinctive Impacts

While new trade theory provides convincing evidence that multilateral trade policies provide enhanced welfare benefits over bi-lateral agreements, many see the latter as a first step towards enlarged, liberalized multinational markets. The promotion of first US-Canada Free Trade Agreement and then NAFTA were based on the premise that an enlarged market would provide mutual benefits to participant countries. Almost all the analysis and the presentation of the outcomes were considered at the *national level*; but what of the *spatial impacts*?

Using a multiregional CGE model, Gazel *et al.* (1996) documented the regional (state-level) impacts of the US-Canada FTA that were of the order of 1-2% in the Midwest states (which had the greatest volume of trade with Canada) and up to 5% in states like Texas with more modest levels of trade. The analysis revealed that the relative regional gains from the FTA depend on factors other than export and import share of each region with Canada and their respective economic size – especially with respect to the size of the trade flows. However, as Gazel (1996) noted, the internal economic structure and the nature and volume of interregional trade played an important role in determining the outcome of the gains from trade. Gazel (1996) further noted that the gains from the trade agreement, while still modest, were significantly enhanced if interregional labor mobility was considered (but still without international mobility). The additional gains were of the order of 1-5

percentage higher for as set of four macro regions of the US; hence, labor mobility serves to enhance the more efficient allocation of resources and thus generates larger gains from the trade agreement.

The spatial impacts of NAFTA turn out to be much more complex; one major structural change generated by this trade agreement was the significant spatial restructuring of the supply chains of many automobile companies. As a result, the sectoral impacts were often much more varied that the spatial impacts. Andresen (2009) measured the impacts of NAFTA on Canadian provinces and found impact on inter-provincial trade more important than province-US trade; once again, the larger impact was on within country trade. The US results mixed – model specifications often fail to capture complex interplay between national and interregional trade, assuming somehow that the two are not connected.

The dominant role and impacts on interregional trade should not be surprising – especially in the North American context. Table 1 shows the growth rates of interstate commodity trade in the US for three time periods, 1993, 1997, 2002 and compares these rates with the growth of GNP. Not surprisingly, the former are growing more rapidly than the latter, a finding that is also found when global trade growth is compared with changes in global gross product.

Table 1: Growth Rates of US GDP and Interstate Commodity Flows

	Growth rates		
	National Domestic Product	Interstate Flows of Commodities (value)	Difference in Percentage Points
1993-1997	15.54%	18.78%	3.23%
1997-2002	15.85%	22.20%	6.35%
1993-2002	33.86%	45.10%	11.24%

Source: Calculations from Commodity Flow Survey, Bureau of Transportation Statistics, US Department of Commerce, Washington, DC

Further, the impact of international trade changes on interregional trade is often significant and spatially concentrated. Table 2 provides an analysis of interregional trade focusing on the Midwest and the Rest of the US for three selected years. First, the proportion of intraregional flows (those circulating within the Midwest or the Rest of the US) declined over the two decades of the analysis, even while total flows increased. Secondly, intra-activity flows (those between the same sectors) increased while inter-activity flows (between different sectors) decreased. Interregional flows accounted for an increasing share of total flows with, once again, intra-activity flows increasing and

inter-activity flows decreasing. Flows within the Midwest but between different states increased as did trade between the Midwest and the Rest of the US (in both directions).

Table 2: Analysis of Interregional Trade in the US, 1980-2000

	1980	1990	2000
Total Flow	4,688,314	4,964,328	5,933,438
Intraregional Flow	**83.2%**	**82.4%**	**80.8%**
Intra-activity	*31.0%*	*35.5%*	*37.5%*
Inter-activity	**52.2%**	**46.9%**	**43.3%**
Interregional Flow	*16.8%*	*17.6*	*19.2%*
Intra-activity	*7.5%*	*8.5%*	*10.0%*
Inter-activity	9.3%	9.1%	9.2%
MW and RUS flows			
MW-to-MW	*13.7%*	*15.0%*	*17.3%*
MW-to-RU	*8.2%*	*8.4%*	*8.8%*
RU-to-MW	*6.1%*	*6.5%*	*7.0%*
RU-to-RU	**72.0%**	**71.1%**	**66.8%**

Source: Author calculations based on CFS (see table 1) and Midwest-Rest of US econometric input-output model developed by the Regional Economics Applications Laboratory.

Table 3 Indirect Interregional Impacts of Changes in International Trade: the US Midwest

	IL	IN	MI	OH	WI	Rest of Midwest	Rest US
IL	43.8	5.1	5	4.1	5.8	20	36.2
IN	5.7	42.7	8.7	7.7	3.2	19.6	32.1
MI	6.1	7.8	30.9	16.2	4.9	28.9	34.2
OH	3.9	4.6	7.6	51.9	2.6	14.8	29.5
WI	11.3	4.4	7.4	5.4	19.7	17.2	51.9
Rest US	6.4	3.5	6.7	5.8	4.1		73.5
Inter-Avg	6.7	5.1	7.1	7.8	4.1		36.8

Source: same as for table 2

Table 3 provides as assessment of the way in which changes in international trade differentially impact regions. Even though the macro structures of the states of Indiana (IN), Michigan (MI), Ohio (OH) and Wisconsin (WI) are similar, a change in international trade demand will generate different impacts – both internally and externally. Wisconsin is far more open – only 20% of the indirect effects of a

unit change in international trade from this state remain within the state. 17.2% leaks out to the other Midwest states and the remainder (51.9%) to the Rest of the US. In contrast, Michigan retains about 30.9% of the indirect effects but almost an equal percentage (28.9%) spills over to the other Midwest states and only 34% finds it way to the Rest of the US. Ohio is the least "generous" with other states, retaining over 50% of the indirect effects within its borders. The strength of these interstate connections in the Midwest – in 1993 over 40% of each constituent state's imports and exports were derived from or destined for the other Midwest states – mean that changes in international trade will have a significantly concentrated effect.

inputs → **Production Block 1** → **Service Link** → **Production Block 2** → **markets**

Figure 1: Production Fragmentation

These processes have been generated by a combination of two forces – hollowing out of individual state economies and a concomitant change in the organization of production. The former effect has seen the average establishment more dependent on inputs located outside the state or region in which it is located and, at the same time, more likely to ship its products outside its home region. This process has come about largely as a result of significant decreases in real transportation costs. Firm reorganization has also taken advantage of these decreased costs; production is now fragmented into more discrete operations in a sequenced value chain of production (see figure 1). Firms are thus able to exploit scale economies, at the level of the individual establishment, and scope economies across multiple establishments. Whereas in the 1970s, market served were local (high, regulated transportation costs limited shipment distance), markets are now more extensive. Both hollowing out and fragmentation have facilitated and responded to increased interregional trade but this trade is not evenly spread over all states.

The Brazilian case is even more interesting. As noted in the prior section, even with significant proactive spatial development policies to address issues of regional disparities, per capita income in the Northeast is only 50% of that in Center-South (where São Paulo is located). These disparities have persisted over many decades and have been the locus of almost every policy ever formulated to address regional development. In Brazil, trade policy has been promulgated primarily on basis of need

to enhance the competitiveness of national economy and to enhance the welfare of Brazilians by promoting competition (between domestic and international suppliers of goods and services); spatial issues were rarely if ever considered. The initial focus was on MERCOSUL/MERCOSUR but subsequent attention has been directed to the potential gains from the development of an Americas Free Trade Area (AFTA) and also the possibility of greater affiliation with the EU.

The analysis was conducted with models built on the B-MARIA system initially developed by Haddad (1999), a multiregional CGE model stylized on the Monash system (originally developed as ORANI by Dixon and colleagues in Australia).   B-MARIA assumes market clearing in commodity and factor markets, utility maximization by consumers, profit maximization by firms, and a perfectly competitive market system. Subsequent version of the model have moved to incorporate non constant returns to scale, imperfectly competitive markets and links with a transportation network; good now flow over a network in the interregional system rather than over an implicit topologically connected set of regions. The results discussed here will examine:

- Overall effects of trade liberalization on regional economies

- Incorporation of some NEG ideas into the analysis and their spatial impacts

- Examination of infrastructure investments (highways and port modernization) and their spatial impacts

The initial motivation for the construction of the model was to explore the degree to which trade liberalization policies were spatially blind – i.e., the degree to which unilateral reductions in tariffs on Brazilian imports would generate similar impacts across the regions of Brazil. Figure 2 provides a sample of the results for two macro regions – Northeast and the Center-South.

**Northeast**   **Center-South**
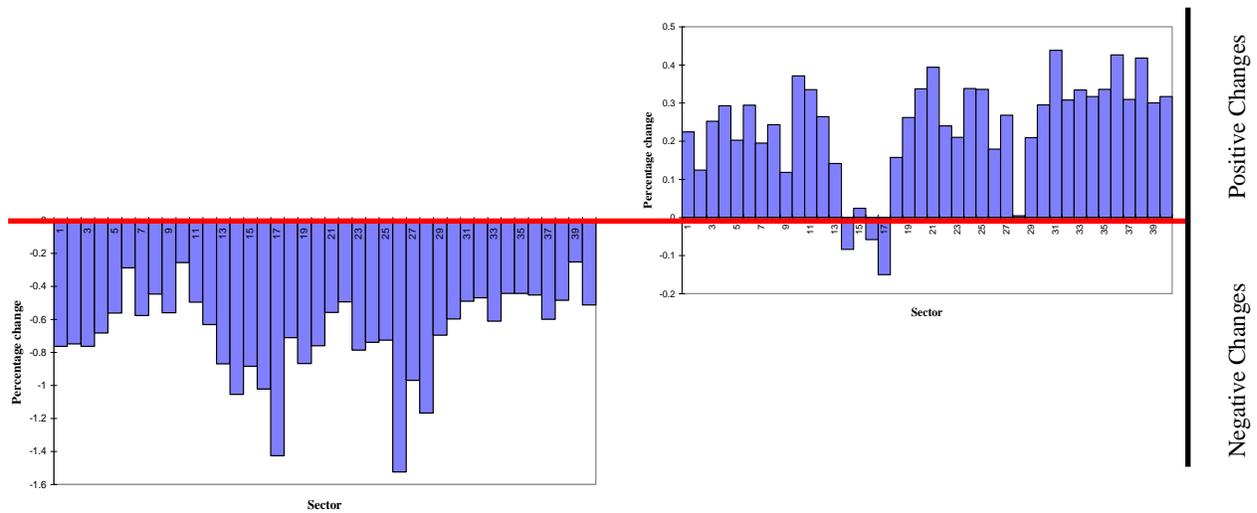
Note: Horizontal axis lists the sectors (agriculture to the left, manufacturing in the center and services towards the right) in each region

Figure 2: Projected Long-Run Activity Effects by Sector of a Uniform 25% Tariff Reduction in Brazil

Primary factor movements play a major role in the results achieved for the long-run. The Northeast is the most harmed region; all the sectors reveal output results below the base case level. These sectors are ones that would suffer from increased importation of very regionally competitive goods. The Northeast sectors would experience declines in demand for their goods as consumer switched to less expensive foreign alternatives. As capital moves away from the region, multiplier effects operate, further deteriorating the regional economy. The increase in the demand for investment in the other regions operates in the opposite direction. Increasing demand for capital goods generates a round of expenditures in these regions especially in the North and Center-South regions.
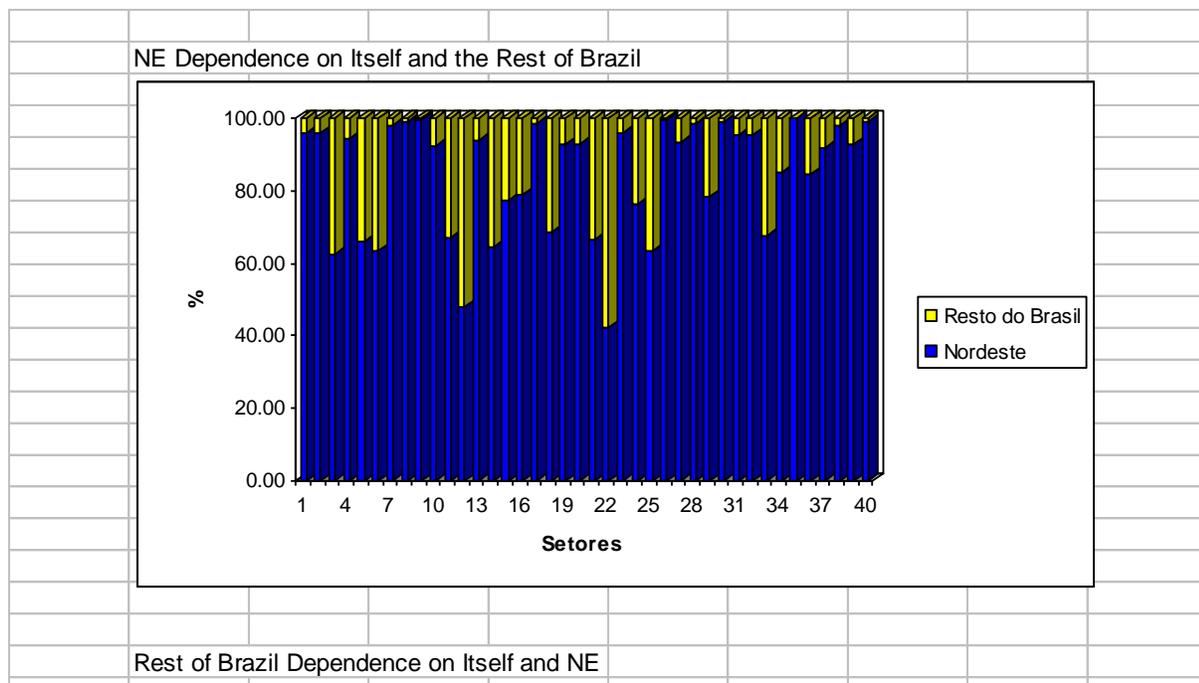
Note: vertical axis is the percentage of total production; dark color indicates share in Northeast, lighter color the share in the Rest of Brazil. Horizontal axis lists the sectors.

Figure 3: Asymmetries in Interregional Trade – Northeast and the Rest of Brazil

Capital goods industries use a greater amount of regional commodities (especially construction) and face lower elasticity of substitution of the Armington type (both for substitution between foreign and the domestic composite, and between goods from different regions in the country). Hence, the overall outcome is positive for almost all sectors. Once again, interregional trade plays a major role in the outcomes; it turns out that there are some important asymmetries in interregional indirect effects. These are shown in figure 3 for the Northeast and the Rest of Brazil. The graph for each region shows the percentage of total production by sector that is dependent on within region as opposed to the other region within Brazil. There are striking differences in dependence; Northeast sectors are much more dependent on the Rest of Brazil than the corresponding sectors in the latter region are on the Northeast.
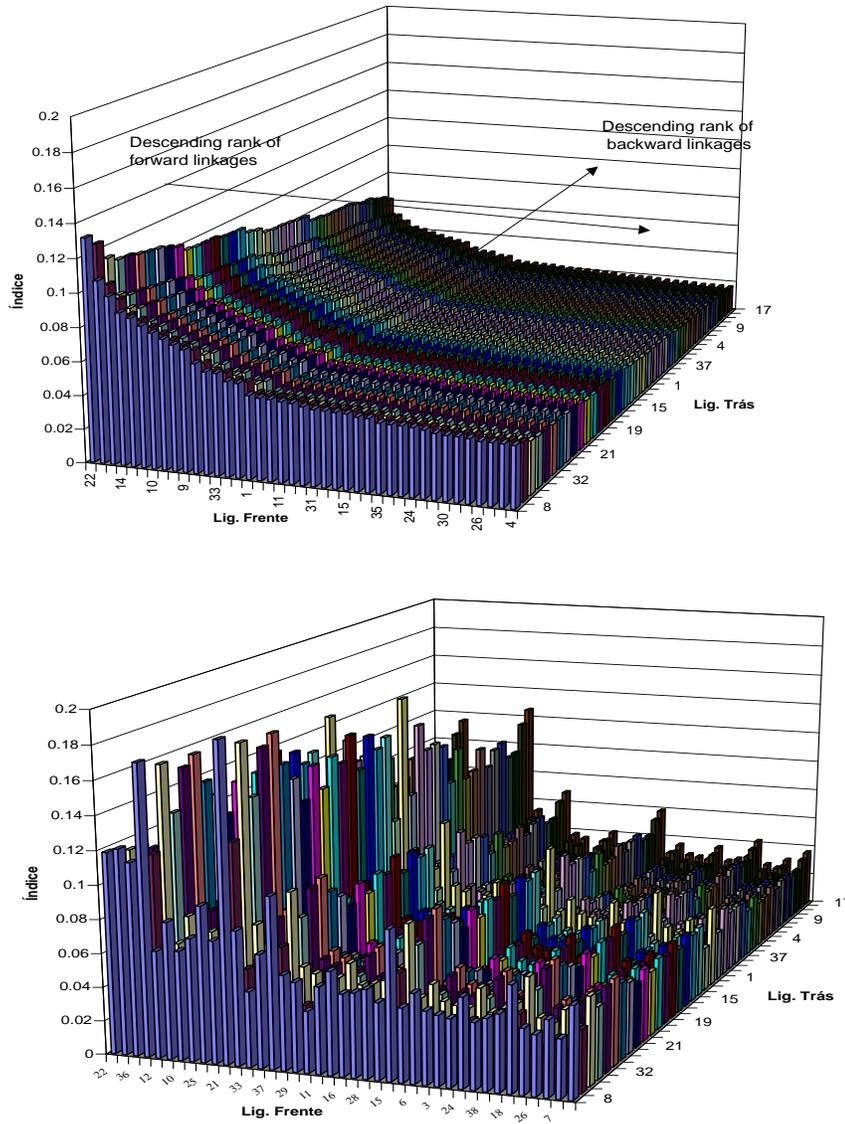
Figure 4: Comparisons of Economic Structure Northeast (top) and Rest of Brazil (bottom)

The implications of this asymmetry provide insights into the reasons for the persistence of spatial disparities in Brazil; development funds expended on projects in the Northeast generate significant leakages to the Rest of Brazil and thus a more muted economic impact within the Northeast itself. The implication is that the economic structure of the Northeast does not provide enough opportunities to locally source inputs into the supply chain, necessitating dependence on inputs produced in other parts of the country. More detailed analysis focusing on cluster-development strategies in the Northeast confirmed this finding; figure 4 summarizes, visually, the differences in the structures of the two economies. Using the concept of a multiplier product matrix (see Sonis and

Hewings, 1999), the elements of the Leontief input-output matrix for the Northeast were ordered in such a way the highest value was located in the southwest corner and the value in the northeast corner (upper part of the figure). An hierarchy of sectors, presenting forward and backward linkages is thus obtained; using the same order of sectors, the data for the Rest of Brazil were organized in the lower part of the figure. If the economic structures of the two regions were identical, then the smooth surface found for the Northeast would be replicated in the Rest of Brazil. Instead, the resulting surface is far from smooth and, further, the elements for the most part are much larger. The presenting in figure 4 complements the findings shown in figure 3. The economic structures are different and given the lower intensity of interactions in the Northeast economy, a unit injection of expenditures would generate smaller ripple effects *within* the region. Hence, spatially blind expenditures are likely to generate significant spillover effects in the Rest of Brazil, exacerbating the already significant differences in welfare levels between the two regions.

Spatial Impacts of Macro Policy: Regional Business Cycles

Fiscal decentralization represents a specific policy initiative that while spatially blind clear has the potential to generate very different impacts across space. What about the impact of other types of macroeconomic policies? Here the analytical difficulties present significant challenges; one approach, that will be described here, is to analyze the issue through consideration of regional business cycles. If the portfolio of policies embraced in national economic policy (monetary, fiscal, trade etc.) is spatially blind, then regional business cycles should mirror their national counterparts. Using two studies, one for the Midwest of the US and the other for all regions in Japan, the findings suggest that regions rarely move in lock-step with the national economy – and certainly not with each other, even regions with which there are major trading relationships.

Starting in the 1960s, as regional economics (or regional macroeconomics as it was often labeled) began to emerge as a recognized area of research, there was considerable interest in applying national macroeconomic analysis to regional systems. The objective was to explore the degree to which national policies that were not spatially targeted generated differential effects on regional economies. Research focused on regional growth, impact analyses, fiscal issues, and regional problems such as the identification of regional Phillips curves and consideration of trade (e.g. Thirlwall's (1980) contention that regional problems were balance of payments problems). Underlying much of this research was the notion that the variations in the economic performance of regions could be traced in large part to differences in economic structure. The much maligned shift and share analysis was proffered as a way

of uncovering the degree to which differences in economic structure could be traced to differential economic performance. However, some formal testing (e.g., Brown, 1969; James and Hughes, 1973) cast doubt on this finding. The fascination with growth center ideas in the 1970s and 1980s drew attention to the importance of interindustry linkages but ultimately failed to achieve traction as a sustainable tool of analysis. More recently, Carlino and Defina (1998) and Carlino and Sill (2000) have returned to explore the regional impacts of "traditional" macroeconomic concerns – monetary policy and business cycles, while Kurre and Woodruff (1995) looked at regional variations in performance in terms of portfolio theory

The US Midwest

It was noted earlier that the core states of the Midwest (WI, IL, IN, OH, MI) are each other's major trading region with 38-40% of each partner's exports destined for the other 4 states. It was also revealed that there had been a significant decrease in intra-state dependency and a concomitant increase in interregional trade, especially focused on the other Midwest states. Given these findings, it would not be unreasonable to posit that states that are major trading partners will probably experience economic fluctuations in common. Park and Hewings (2003) explored the issue by constructing business cycles for each of the Midwest states and then comparing economic performance with the US as a whole and one state with another.

While each state might be heavily dependent upon its other Midwest neighbors in terms of trade, table 5 reveals that there are some important differences in the structure of production. Manufacturing is much less prominent in Illinois than in the other Midwest states – in fact Illinois' structure looks much more like the US than its Midwest neighbors. Hence, it would not be unreasonable to assume that Illinois and US business cycles would be more similar than Illinois and other Midwest states.

Table 5. Ratio of Industry Production to GSP (2000)

Industry	Illinois	Indiana	Michigan	Ohio	Wisconsin	U.S.
Agriculture, forest., fish	0.89	1.16	0.89	0.93	1.64	1.36
Construction	4.77	5.12	5.11	4.51	4.86	4.66
Manufacturing	15.71	30.65	26.27	23.99	25.38	15.37
TPU	8.82	7.51	6.56	7.27	7.17	8.18
Wholesale Trade	7.92	5.96	7.24	7.11	6.47	7.04
Retail Trade	8.06	9.04	9.23	9.71	9.35	8.97
FIRE	20.73	13.23	14.27	16.36	15.81	19.99

| Services | 23.04 | 17.04 | 19.93 | 18.76 | 18.21 | 21.40 |

Cyclical Part of Midwest States' Coincident Indexes
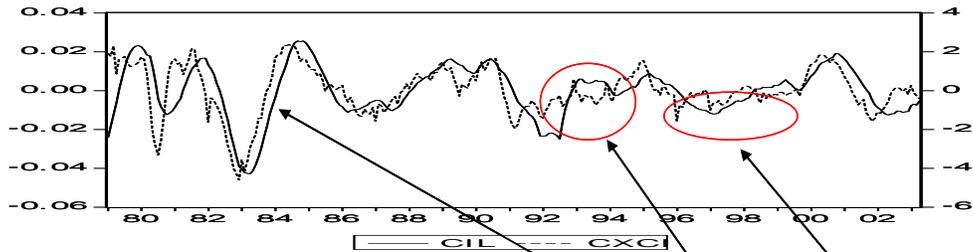
Illinois: lags national cycle 3-4 months; different behavior in middle expansion/contraction
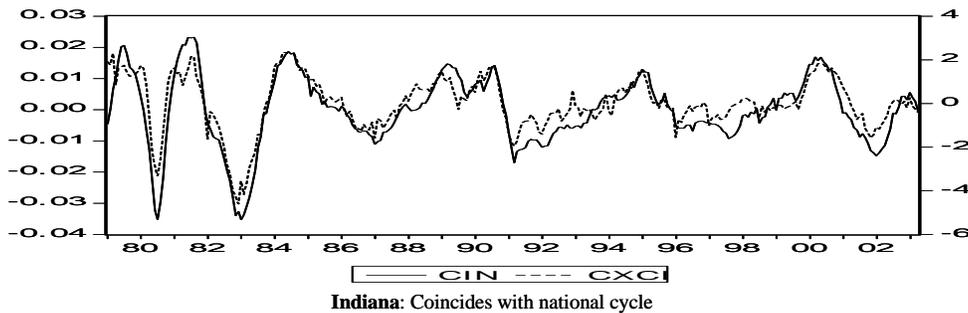

Indiana: Coincides with national cycle

Figure 10: Business Cycles for the Midwest States

The findings of the analysis are presented in figure 10 and reveal that, using the cross-correlation analysis with the Hodrick-Prescott filtering method and a Granger-causality test, the business cycles of Michigan, Ohio, Indiana and Wisconsin coincide with the national cycle while the cycle of Illinois lags the national cycle by 3 to 4 months. This phenomenon turns out to be generated from the differences in industry structure. However, two aspects of this structure are not revealed in table 5; first, one can derive no information from vector representations of structure about how these sectors are linked together. Secondly, even with access to input-output tables, it would be difficult to discern the sequential or value-chain of production – the order in which commodities and services are moved to produce a finished good or service. There is another reason that generates the basis for this conundrum; even though subsequent census commodity flow data (for 1997 and 2002) and REAL's

own estimates through 2006 suggest that these states are still very strongly interconnected in terms of trade, Illinois has transformed its structure so that it now looks more like the US than its Midwestern neighbors.

It turns out that manufacturing, wholesale trade and retail sale sectors react promptly to the national shock while service and FIRE sectors respond to the national disturbance with time lags. As a result, relatively service-oriented Illinois lags other neighboring states. Regression analysis reveals that the industry mix effects explain more than 60 percent of the variance of the state coincident index and around 40 percent of the variation of state total non-farm employment. In addition, the simulation results from the VAR model demonstrate that the transmission mechanism and autoregressive property of economic activity expand the time differences in the business cycles among regions caused by the industry mix effects.
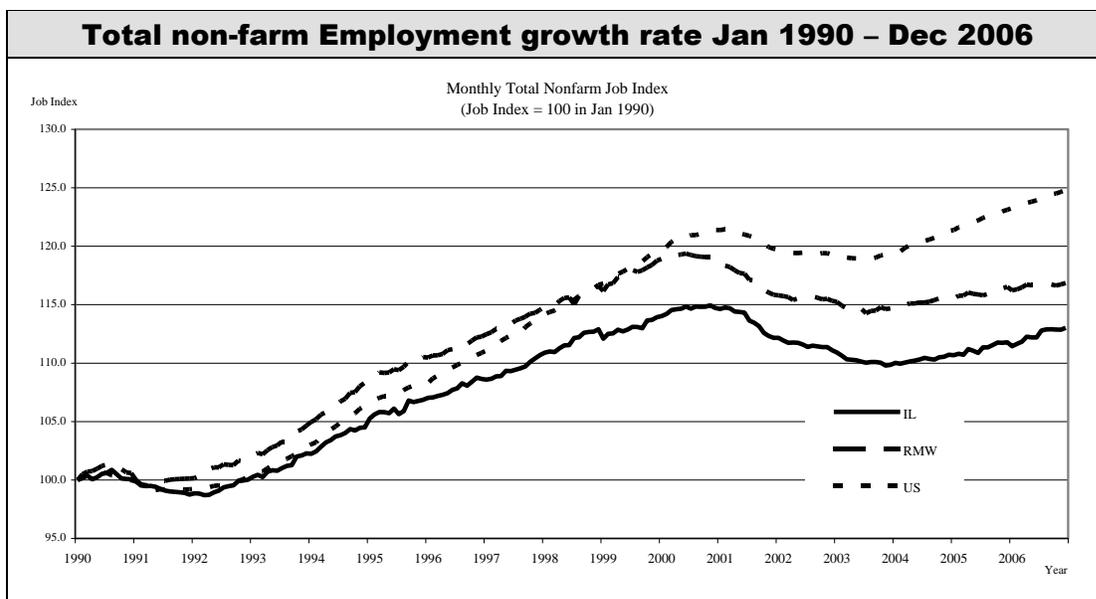
Figure 11: Employment Growth (1990=100) in Illinois, Rest of the Midwest and US

While one might not be able to point to any received theory along these lines, one might proffer the expectation that given the successful performance of the US economy in the 1990s, a state that mirrored its structure could be expected to perform better than states with a different mix of activities, ceteris paribus. Figure 11 provides one indicator that would tend to confound this expectation; in

terms of employment growth, benchmarked at 100 in 1990, Illinois has seriously underperformed the US economy and until 2006, the Rest of the Midwest. The latter region, with an employment structure that is different from the US has performed better (through 2005) than Illinois although the massive automobile industry restructuring currently underway is likely to see this performance deteriorate significantly over the next several years. Neither the Rest of the Midwest, nor Illinois ever recovered from the 2000-2001 recession (in the sense of reclaiming a prior employment peak) prior to entering the current (2007-) recession, unlike the US that recovered by February 2005.

When Illinois was dominated by manufacturing, it would have been easy to explain the growth rate mismatches and the business cycle differences from a structural perspective; what is even more surprising is that Illinois transformed to a service-dominated economy 2-3 years before the US as a whole. The Schumpeterian gales of creative destruction that rippled through the whole Midwest manufacturing sector, generating over 0.75 million job losses from 1980 through 2006 in Illinois, were also characterized by a rapid build-up in the service sector. Yet, this apparent early competitive advantage has not been sustained and the evidence since 1990 has found that the Illinois economy has failed to grow at US rates across a broad ten-sector classification of economic activity. So the conundrum persists. A state that trades predominantly with its neighbors has transformed itself in terms of structure to look more like the US than these neighbors, yet lags the US in business cycles and has added jobs since 1990 at about half the rate of the US as a whole.

In the search for explanation, many analysts have begun to explore the way in which production fragmentation has changed the nature of inter-national and inter-regional linkages. In addition, it is entirely possible for regions to become more integrated and competitive at the same time; clearly, the nature of trade and the increasing domination of intra- over inter-industry trade generates a different dynamic that has changed the competitive advantage of regions. Many of these changes have been propelled by significant transformations of firm ownership and organization.

The Japanese experience[1]

It is important that any disparities in regional business cycles be interpreted with reference to potential differences in the economic structure of the regions as well as differences in their interdependence. For this purpose, the analysis of Hitomi *et al.* (2000) could be helpful; they explored the contribution of demand, technical change and changes in international and interregional trade in generating

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[1] This section draws on Hayashida and Hewings (forthcoming)

economic change in nine Japanese regions using a multi-regional input-output model with endogenous imports. Their analysis is summarized in table 6 which shows whether the contribution of these factors on regional output is positive or negative in 1985-1990. According to this table, the regions which experienced a negative contribution of technical coefficients to regional output are Hokkaido, Tohoku, Chubu, Chugoku, Kyushu and Shikoku. In this group, the direct effect of the demand generated within the region on output in the region is decreasing. That group is categorized more into four sub-groups. The first sub-group is Hokkaido, Tohoku and Chubu where the contribution of both international exports and inter-regional trade is positive. The second sub-group is Chugoku where the contribution of international exports is negative but the contribution of inter-regional trade is positive. The third sub-group is Kyushu where the contribution of international exports is positive but the contribution of inter-regional trade is negative. The last sub-group is Shikoku where the contribution of both international exports and inter-regional trade is negative. On the other hand, in Kanto and Kansai, the contribution of technical coefficients is positive. In Kanto, the contribution of international exports is positive but the contribution of inter-regional trade is negative; in Kansai, it is the other way around.

Table 6: Factor contribution to aggregate regional output growth (1985-1990)

Typology	Feature #1	Feature #2	Sign of factor contribution		
			Technical coefficients (A)	International Exports (E)	Interregional trade coefficients (T)
Hokkaido, Tohoku, Chubu	(A) is negative	(E) & (T) are positive	-	+	+
Chugoku		(T) is positive	-	-	+
Kyushu		(E) is positive	-	+	-
Shikoku		All negative	-	-	-
Kanto	(A) is positive	(E) is positive	+	+	-
Kansai		(T) is positive	+	-	+

Note: This typology is based on Hitomi *et al.* (2000).

The following two hypotheses can be generated from the above typology. The first is that the business cycles in Kanto and Kansai, where the direct effect of the intra-regional demand to the output is positive (that means the positive contribution of technical coefficients), could change independently, if the regional business cycles are predominantly influenced by their own regional output. Moreover,

the business cycles of both regions could dominate the nation-wide business cycles, because about 66% of growth of the output in Japan is accounted for by the change in factors occurring in Kanto and Kansai. The second is that the business cycles in Hokkaido, Tohoku and Chubu, where the contribution of international exports and inter-regional trades are positive and the contribution of technical coefficients is negative, could be influenced by the change of the economies both in foreign countries and in the other domestic regions. Further, the business cycles in Chugoku, where the contribution of inter-regional trade is positive, could depend on the change of the economies in the other regions. The business cycles in Kyushu, where the contribution of international exports is positive, could depend on the change of the economies in foreign countries. These hypotheses will be measured against the typology extracted from analysis of the turning points of the regional business cycles.

Table 7 Summary Categorization of Regional Business Cycles in Japan

Major Factors of Influence

Regions predominantly influenced by production and consumption:
        Chubu, Chugoku, Kyushu and Hokuriku.
Regions predominantly influenced by production and employment:
        Tohoku, Kanto and Shikoku.
Regions influenced by production, consumption and employment:
        Kansai and Hokkaido.

Relationship between National and Regional Cycles

Expected duration of a business cycle is similar to the national cycle:
        Tohoku, Kanto, Kansai and Kyushu.
Expected duration of a business cycle is shorter than the national cycle:
        Hokkaido, Chubu, Hokuriku, Chugoku and Shikoku.
Share of the expansion phases is higher than the national cycles:
        Tohoku, Hokuriku, Shikoku and Kyushu.
Share of the expansion phases is similar to the national cycles:
        Hokkaido and Kanto.
Share of the expansion phases is lower than the national cycles:
        Chubu, Kansai and Chugoku.

The results of the analysis are presented in table 7. Each region has different principal factors in changing the regional business cycles. One of the most influential reasons why the above differences could arise stems from the difference in the industrial structure in each area. In the regions where one

of the main factors in changing business cycles is the employment situation, the share of non-manufacturing sectors tends to be relatively high. Using a regime-switching model, it is possible to classify the regions into five groups in terms of the regional business cycle turning points (second part of table 7). Each region also has different characteristics from the viewpoint of the turning points of business cycles. It was found that the regional differences of the expected duration and the share of the expansion phase might arise from the reason such as the differences in demand structures, input-output structures and inter-regional in addition to the profile of industrial structures in the regional economies. In interpreting the findings, a number of generalizations can be proffered. A region where the share of non-manufacturing sectors is relatively high has a tendency for the duration of a regional business cycle to become longer and the share of expansion phase in the long run to become larger. The increase of dependency in international exports might lead to the increase in the share of the expansion phase. The shortening of the expected duration of a business cycle might be caused by the decrease of intra-regional dependency and the increase in the dependency on interregional trade.

Demographic Challenges

Problems of ageing

Role of immigration

New Initiatives

More sophisticated models but regional policies have not been modified to embrace more complex economic structures

Implications for Andalucía