EFFECTS OF POPULATION REDISTRIBUTION IN THE NORTHEAST

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Bangor, Maine's, claim to fame is its statue of Paul Bunyan and my little Company only sells about 2 percent of New England's electricity. Why, then, our interest in population redistribution in the Northeast. Well, it's because we have a capital budget of $180 million for the next decade and for every family of four we expect, but doesn't materialize, we've shot $10,000 of somebody's money. I'd like to tell you how we go about forecasting. In one approach we start with population and build our forecast block by block. In a second approach we start with national projections and back into regional demography almost as a byproduct.

Briefly, the building block, or "inductive", approach is quite traditional. Population projections are developed using an age — cohort survival technique, Census data, and birth and death rate trends adjusted to Eastern Maine. We have experienced in-migration at the rate of 1 percent in the 1970's and predict this falling to 0 percent net migration in the 1980's. Our partly subjective, partly empirical reasoning for the in-migration includes quality-of-life; the trend of retirees to shift from 9 months in Florida, 3 in Maine, to 3 in Florida, 9 in Maine; the recreation growth bubble moving eastward along the Maine coast to our Hancock County, one of the fastest growing counties in the Northeast, and the economic bubble moving northward along Route 95 with Bangor possibly next in line for growth. We tie commerce to population and then observe anomolies. In Hancock County commerce has led population. We think that commerce, here, may be artificially high as a result of rapid real estate turnover which put money in the hands of property rich — income poor natives on a one shot basis. Another observation is that truly rural counties seem to be stagnant while small town counties are displaying growth. A study of towns by size and types of services available indicates that services are similar for towns from 5,000 to over 10,000, but fall off precipitously below that level. In the area of manufacturing employment we carry out a comprehensive survey of major employers and find that such lead industries as pulp and paper are now in consolidation after major expansions, and that light footloose growth industries such as electronics are cautiously optimistic for the region. Looming over our shoulders are such unknowns as an oil refinery, major federal public works, and a lead industry, such as an IBM or Digital, which could trigger explosive growth as they did in Southern New Hampshire or Burlington, Vermont. This approach is historically based and wears like an old slipper. It probably can't get us into too much trouble in the short run, but it does leave us increasingly vulnerable down the road, e.g., we assume a zero net migration in the 1980's for lack of knowing what else to do.

Having swung at the forecast with our left, we swing again with our right using a national or deductive approach.

Nationally net migration is small so a 10-year forecast of population is fairly reliable. We also find that national think tanks like DRI and NPA come up with some fairly consistent economic forecasts including a labor force of 111 million in 1985 allocated to standard industrial (SIC) classifications and 5 percent unemployed. Now, this employment can be allocated to economic regions of which one may be defined as a geographical area where a work force is both employed and resides, that is, commuting is internal. Such a region might be Penobscot County, the State of Rhode Island, New England, or the Susquehanna River Basin. The implication of this approach is that there is a balance between jobs and labor force and if this equilibrium is disturbed, economic and demographic changes will commence. If we understand the internal demographic and economic interactions of a region, we can then plug in an external influence, such as a forecast of national employment, and then derive the effect on population within the region over time.

The key to this approach is employment. First, we must divide up employment into "local serving" and "export serving" jobs. "Export serving" employment are generally manufacturing jobs plus those unique non-manufacturing activities that serve a national market such as insurance in Hartford, education in Boston, and recreation in Maine. "Local serving" employment is split among "household serving" jobs, and "business serving" jobs. Most S.I.C. nonmanufacturing classes are split between these two. For example, agri-fish-forestry jobs are 14 percent household serving, 86 percent business serving, banking and insurance is split 50/50, while construction is 89 percent household, 11 percent business serving, as determined by final product analysis.

Why the breakdown? Because household serving jobs are directly related to population with 20 such jobs per 100 people in Connecticut, 18 such jobs per 100 people in Maine. Trend analysis enables us to shift a higher rate of jobs per 100 over time, based on national projections, particularly of government, education, and medical services. The national multiplier has gone from 1 in 1970 to 1.17 in 1985 when we look at states, however, we experience distortions for Massachusetts and New Hampshire. Not only has Massachusetts had a high number of household jobs per 100 people, but part of it was the services it provided to people in its New Hampshire suburbs. Now New Hampshire is playing catch up in services at Massachusetts expense such that it's multiplier is 1.3 for 1985 compared to a depressed 1.1 in the Commonwealth. I use this one detailed example to demonstrate how easy it would be to overstate and understate these state's employment derived population growth, respectively. So much for household serving employment.

Business serving employment is different for it is wed to lagged total employment, not population, e.g., it represents 15 percent of total employment in New Hampshire, 19 percent in Massachusetts. Again we use national and regional trend analysis to formalize the relationship.

So far this is like Sinbad throwing his anchor into a whale with employment and population chasing each other. Enter export serving employment, which is bolted to a national forecast. This external input upsets the internal equilibrium and directs the local serving employment and population dynamics.

The method of allocating national export seving employment otherwise known as manufacturing jobs, is through a cost-of-doing-business index for each region. We look at labor, taxes,

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energy, and transportation which comprise 10 to 40 percent of costs. We find that labor costs are generally highest in Connecticut to 90 percent of the national average in Maine. But, labor costs in the large paper industry in Maine are well above the New England and national average, and labor costs in growth oriented electronics is below the national average in Connecticut. Business taxes are 50 percent above the national average in Connecticut, 30 percent below in Maine, New Hampshire, and Vermont. Energy costs are 40 percent above the national average in Connecticut, but only 20 percent above in Maine, due to cheap electricity. All of New England suffers in transportation. Since profit margins are low in manufacturing, these differentials are prophetic when combined with state and regional trend analysis. There is also an observable negative business bias against all but New Hampshire. For example, between 1960 and 1970 costs had to be 3 percent below the national average in Southern New England to attract employment at the national rate.

Finally, to understand employment/demographic interaction we look at the region using the age-cohort survival approach and come up with and indigenous labor force, established by multiplying age/sex specific labor force participation rates by population in each age grouping and then introduce anticipated changes in the participation rate. Subchanges recognize marginal withdrawal from the labor market when, for example, unemployment is high and vice-versa, that is, inner city blacks withdraw when black unemployment is high, even if regional employment is tight. Beyond this observable internal ability of a local labor force to adjust to employment change we must turn to migration as an equalizing mechanism.

Demographic age and sex structure of a region affects migration. For example, a surplus of young adults are more likely to move than surplus older adults. There are non-economic factors like sun in Arizona, welfare in Massachusetts, town meetings in Vermont. Regression analysis can help us deal with these factors. That leaves the employment/wage factor. Plug an employment forecast into a region for each year from now to 1990 and allow the internal dynamics to occur and we derive an age specific net migration pattern, state-by-state, county-by-county. Thus we have a regional export and local serving employment forecast, the latter merely redistributing income already there, and both interacting with the labor force to bring about population redistribution. Population then feeds back into household serving employment and a dynamic simulation of the region over time can take place, from which we can pull off demographic, electric power, housing and economic forecasts as well. A change in national forecast, the cost index, or an update of actual population with the 1980 census can be introduced and their effects on the forecast measured.

Since this approach to forecasting is used by all New England utilities, I hesitate to forecast for counties and states outside Bangor Hydro's service area except perhaps to say it appears that growth in Southern New Hampshire will continue to lead New England in both employment and population and that Connecticut and Rhode Island may regain some momentum while Massachusetts, particularly, and Maine and Vermont, possibly, may not do as well. The forecasting drag on Maine's growth is of particular interest to my company for we find that within Maine, our rural service area is forecasted to experience no such drag, a forecast that generally agrees with our inductive forecast discussed earlier. We are now trying to find either errors or explanations.

In closing I would like simply to say that as complex and counterintuitive as this subject of population redistribution may be, we in industry find the subject anything but esoteric.