

# Accounting for Regional Economic Development Impacts in Benefit-Cost Analysis

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In this note, I address the general issue of why regional impacts, such as jobs, are not directly accounted for when preparing Benefit-Cost Analyses for Regional Economic Development (RED) projects. Regional Economic Development is well-served when investments increase economic productivity and competitive advantage, resulting in income and jobs being maintained or increased in the region. Accounting for this underlying economic productivity effect is the role of Benefit-Cost Analysis. This accounting is based on an understanding of national and regional industry and factor costs that allows economists to identify Regional Economic Development investments that result in National Economic Development (NED) – an increase in the nation’s economic productivity. If the underlying national economic productivity condition for development is not present, any projected regional jobs impacts are not likely to occur and be sustained. For this reason, I recommend conducting a consistent set of Benefit-Cost Analysis and Economic Impact Analysis for each investment project to understand both the effect of the investment on economic productivity and competitive advantage and the projected result these changes have on regional economic indicators such as jobs and income.

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## **Issue**

Why can't the projected increase in regional jobs be included as a benefit in Benefit-Cost Analysis (BCA)? This question is asked by many professionals working in industry and economic development who feel confused by what is, and is not, a benefit associated with a proposed investment. This confusion is easy to understand, since often one of the most important intended effects of a proposed investment is to increase jobs in a region.

In this note on Benefit-Cost Analysis accounting, I address the general issue of why regional impacts, such as jobs, are not directly accounted for when preparing BCAs for regional economic development projects. This issue relates to BCA measuring the effect of the investment on productivity and savings that causes economic development

rather than the results of a change in productivity, such as jobs. I also discuss accounting for National Economic Development (NED) versus Regional Economic Development (RED) since this distinction appears to add to the confusion in cases where regional investments in infrastructure are funded by federal agencies. In these cases, it is not that “regional” jobs are not accounted for in BCA while “national” jobs are, it is that BCA measures the economic return on investment rather than the results of this return on economic indicators, such as jobs.

## **Discussion**

During the mechanization and computerization development phases of the U.S. economy, regional development was largely explained by competitive advantage. Businesses sought out regional locations that offered a competitive advantage, ultimately measured in productivity and cost savings per unit of production. In the research literature on industry development and location, regional factor costs largely determined regional development. Factor costs, in turn, depended upon a region's material, land, and labor resources, and its investments in transportation, energy, water, education, research, health, and other infrastructure necessary for business, worker, and household productivity.

As we enter an era of redevelopment that marries mechanization with computerization to create the automation economy, competitive advantage will continue to give life to regional development. For economic development organizations, this redevelopment phase of the economy offers new opportunities to invest in infrastructure that affects business, worker, and household productivity and competitive advantage. This competitive advantage, in turn, will create jobs.

I begin with this discussion of the role of competitive advantage for two reasons: 1) to explicitly introduce the distinction between the cause, effects, and results of development, and 2) to help understand the federal perspective when evaluating regional investment requests, where National and Regional Economic Development are tied to a common definition of productivity. Below, I discuss the difference between accounting for effects and results, followed by a discussion of measuring national and regional productivity.

### Measuring effects and results

A key driver of increased income and jobs in a region, and collectively as a nation, is productivity. As industrial production becomes more efficient and uses fewer monetary resources per unit of production, the economic system creates more real income to

spend, save, and invest. Stated in terms of regional development, a region may have lower input costs per unit of industry output compared to other regions due to its natural and human resources and investment in infrastructure. This cost differential translates into a competitive advantage, which causes industry to expand production in the region. This expansion, caused by a productivity advantage, has the result of raising regional employment and income levels. In this example, regional resources and investments affect production costs -- a productivity advantage -- which has the result of expanding production in the region and increasing regional income. Without this effect on productivity there will be no impact on employment or income.

Accounting for this effect that underlies regional development -- that of economic productivity and savings -- is the role of Benefit-Cost Analysis. Benefit-Cost accounting measures changes to productivity and savings rather than the impacts, or results, that these changes have on the economy. When performing a Benefit-Cost Analysis, we are measuring whether an investment will improve productivity in the economy. BCA answers the question of whether the investment will result in savings by producing more with the same cost in resources (or producing the same amount with less cost in resources).

This change in productivity includes measuring savings for both industry and households. For example, an investment in highways may increase safety and lower congestion, increasing productivity for both freight transportation as well as for households and workers who commute by car. Both industry and household productivity benefits are included in BCA. Producers, workers, and households save over what they are currently paying, creating an economic surplus. It is this surplus, this savings, that is measured by Benefit-Cost Analysis.

I sometimes see where accounting for the productivity effects often gets confused with accounting for "national" versus "regional" benefits. For example, rather than being a question of national but not regional benefits getting counted, regional jobs are not included in BCA because BCA measures productivity effects and savings that underlie results, such as increased employment. To begin unraveling the confusion that often accompanies benefit accounting for investments in Regional Economic Development, it is important to understand this distinction between accounting for the effect on productivity caused by an investment rather than accounting for the effect on employment caused by the change in productivity.

## National Economic Development occurs regionally

Next let's clarify our thoughts around National Economic Development. Federal agencies often require that expenditures of federal funds advance National Economic Development, with Regional Economic Development being considered only in specific cases. To begin exploring this guidance, let's explicitly recognize that National Economic Development only occurs through Regional Economic Development. That is, all development happens somewhere within a nation's boundaries, in some region. For National Economic Development to occur, Regional Economic Development must also occur. That is to say, a BCA accounts for Regional Economic Development when it accounts for National Economic Development.

Going back to our previous section on cause and effect, plus recognizing that all national development happens in a region, we can now say that *quantifying the benefits of National Economic Development requires measuring the national change to productivity that happens regionally*. In a BCA, we are not measuring the change in national employment, but the change in national productivity and savings -- the economic surplus. And this national change, when it occurs, occurs regionally.

So, if National Economic Development only occurs through Regional Economic Development, is all Regional Economic Development also National Economic Development? We established that the answer to this question does not involve accounting for jobs, since neither regional nor national benefit accounting measures job impacts. In BCA, we are not directly measuring if jobs are shifted from one region to another rather than increased nationally. Instead, BCA involves accounting for an investment's effects on productivity. So to answer the question, we need to understand if an increase in regional productivity also increases national productivity.

## Industry productivity

When is a change in regional productivity also a change to national productivity, and how does this fit into Regional Economic Development? These questions do not have obvious and straightforward answers because we structured our thinking around general concepts of development rather specifically on industry productivity and development.

Over time, industries tend to locate at sites that offer lower costs per unit of production. For some of their production inputs, costs are location-specific, while for others location plays an insignificant part in determining production costs and thus productivity. For example, electricity costs vary by region, as do transportation costs based on available

modes and distance to materials and markets, but the cost of production equipment may be very similar across all locations. Taken together, there is a sorting out of locations by a combination of these input factor costs.

As businesses make location decisions over time that minimize their cost per unit of production, industries as a whole operate at minimum cost averaged across locations. Locations serve markets, and to serve all markets nationwide and globally, industries often face the situation where some markets cost more to serve than others, since input and transportation costs vary geographically. The minimum average cost for the industry is realized when businesses relocate to regional sites that offer a competitive advantage to collectively serve its national (and global) market. That is, the industry's minimum average cost per unit of production is a statistic derived from these regional minimum cost locations to collectively serve its national market.

As input costs change over time relative to each other and location, production will relocate to more competitive locations. One such driver of relocation is infrastructure investment that lowers industry costs and increases productivity. For example, let's say a regional economic development authority invests in railway infrastructure to reduce freight transportation costs at an industrial park. If this freight cost reduction in combination with all the other location-dependent costs lowers the cost per unit to serve a market for an industry, then the regional investment in the railway has productivity benefits for the industry. If not, then the investment has no long-term productivity benefits even though the investment reduces costs for one factor of production. This type of situation could occur if, for example, a location has higher electricity and land costs; while the investment lowers transportation cost per unit, the location is still not competitive with other locations for the industry on a per-unit cost basis across all inputs.

Now back to this question of regional versus national productivity. When a regional investment increases an industry's productivity, not just a factor's productivity, then the investment in regional productivity increases national productivity. If the industry's productivity is unaffected by the investment due to higher costs for the other factors of production, then neither regional nor national productivity is advanced.

The same can be said for household productivity as well. Using a hospital as an example, let's assume a rural county is considering constructing a new hospital to serve its citizen's health needs after two private hospitals were closed. Input costs for land, labor, and energy across all potential locations are the same within the county; what changes across locations are the costs to households of accessing health services. The

county chooses a location that reduces access costs for its residents in an amount that exceeds the hospital cost. In this case, the investment lowers the hospital industry's costs to serve the region and entire nation, resulting in both a regional and national productivity gain.

To conclude this discussion, we can state that when a regional investment that changes a factor's productivity also changes an industry's productivity, then the investment improves both regional and national productivity; otherwise there is no development benefit to the investment regionally or nationally. That is to say, if we focus on industry productivity and measure it correctly using appropriate costs, then all investments in regional economic development that offer competitive advantage to industry are also national investments in economic development. If we stray from the guidance of accounting for a change in industry's productivity caused by a regional investment, then national productivity is no longer married to regional productivity. It is important to note that, even though I use the term "industry productivity," I am including the household productivity of customers and workers when defining an industry's productivity. I talk about industry productivity instead of the more general term "economic productivity" only as a simplifying aid in explaining the central role of *industry* rather than *factor* productivity in tying regional development to national development.

## **Guidance**

To a significant degree, the language around BCA and Regional Economic Development hampers an understanding of how BCA serves the interests of Regional Economic Development. *Regional Economic Development is well-served when investments increase economic productivity, as this competitive advantage causes income and jobs to be maintained or expanded in the region and nationally. BCA is the accounting method that directly supports these economic development investment decisions by measuring savings as a return on investment.* Economic impact accounting, on the other hand, projects the results that these savings will have on commonly used indicators to track economic development, such as jobs, but does not directly account for the underlying effect on economic productivity. Conducting a BCA is the best practice since it helps to avoid the situation where employment and income projections are not based on a change to productivity. If the underlying condition for development is not present, the projected jobs impact is not likely to occur.

Our general guidance when preparing and reviewing a Benefit-Cost Analysis is similar to our guidance when developing economic development plans for a region: focus on

investments that improve industry, worker, and household productivity. In the table below, I offer guidance for projects that are designed to either create competitive advantage or maintain an existing advantage. Within these two categories, I offer separate guidance by national market type. For simplicity, I divide national market types into two categories:

1. Geographically dispersed - In practice, this market type requires that facilities are located within each regional or local market to serve the population, such as hospitals, safety and household services, and utility infrastructure. Competitive advantage for this market type is measured within the local market area.
2. Geographically concentrated - In practice, this market type is characterized by facilities that can be located anywhere in the nation. That is, competitive advantage is measured across all national locations. Most manufacturing industries fall into this category, with exceptions such as ready-mix concrete manufacturing in which the manufactured product cannot be transported long distances.

Table 1: Benefit-Cost Analysis guidance

Economic Development Project Category	National Market Type	Benefit Accounting General Guidance
Create competitive advantage	Geographically dispersed	Measure factor savings for investment (e.g., transportation) using current local market size and projected industry growth. Measure savings for other inputs only if costs vary by location within the local economy. Include productivity, safety, and emissions savings for affected industries and households.
	Geographically concentrated	Measure productivity savings for relevant industries using projected relocation share of national industry, capped at site capacity. Combine level of industry productivity improvement and expert judgment on regionalization of industry to estimate local production potential (industry relocation share). Use projected industry growth rate over the investment benefits time horizon. Include productivity, safety, and emissions savings for industry and households.

Economic Development Project Category	National Market Type	Benefit Accounting General Guidance
Maintain competitive advantage	Geographically dispersed	Measure factor savings for investment against a base case where the competitive advantage is lost. Include savings for other inputs only if costs vary by location within the local economy. Include productivity, safety, and emissions savings for affected industries and households compared to the alternative of losing the competitive advantage.
	Geographically concentrated	Measure productivity savings for relevant industries that result from the investment against a base case where the productivity advantage at the location is lost and industries relocate to other sites. Use current industry production level at the location and projected industry growth rate over the investment benefits time horizon. Include productivity, safety, and emissions savings for industry and households.