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Analyzing the Benefits and Costs of Economic Development Projects

Jonathan Q. Morgan

Introduction

As communities compete for private investment and jobs in an uncertain global economy, they will need greater access to better information on the expected benefits and costs of economic development projects to make sound decisions about them. An increasing number of companies ask for cash and other inducements as a requirement for locating or expanding their operations in a particular location. The use of such business incentives to promote economic development poses considerable financial risk for local governments unless proper safeguards are in place. How can local governments avoid paying too much for too little in return? Local governments can mitigate the financial risk of incentives by making an accurate assessment of whether a development project will generate economic and fiscal benefits that will outweigh its costs. Such an assessment increases the likelihood that incentives will be an investment of public dollars for the greater good rather than merely being a subsidy of private business activities.

This bulletin discusses some of the analytical approaches and tools available to assess the benefits and costs of development projects. It highlights the advantages and limitations of various approaches and notes certain pitfalls. This bulletin is *not* intended to be a technical guide for how to conduct an economic or fiscal impact analysis. Instead, it introduces the basic concepts and describes the fundamental knowledge required for public officials to better understand the importance of having access to such analysis to get the information needed to assess a project. This bulletin should be especially useful to local elected officials who must decide how to vote on a growing number of incentive requests from both prospective and existing businesses. It will help staff who must advise elected officials on how a project will benefit the community and what amount of incentives, if any, is reasonable to offer. Finally, it may also assist public officials who must demonstrate the economic benefits of local projects when applying for federal stimulus funds and seeking other grant opportunities.

Jonathan Q. Morgan is a faculty member at the School of Government specializing in economic development.

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How Will a Development Project Affect the Local Economy?

The first question in assessing whether a development project is worthy of some amount of public investment is, What economic benefits will the project create for the community? These benefits are most often measured in terms of employment, income, and output (business revenues or sales).

In 2006 Google announced it would build a $600 million data center in Lenoir (Caldwell County), N.C. This project provides a useful illustration for how to assess and interpret the estimated economic effects of a new business location. Google is expected to employ 210 workers at the facility itself. While these 210 jobs will be directly supported by the day-to-day operations of the new facility, the North Carolina Department of Commerce estimates that Google will create a total of 582 jobs statewide.[1] If Google is directly supporting only 210 workers, how can the total employment expected to come from the new facility be nearly 600?

Economic Impact Analysis

The primary quantitative technique used to estimate the economic benefits of a proposed development project is economic impact analysis. Economic impact analysis estimates how changes in economic activity, such as a new business locating in a community, will affect the wider local or regional economy. If the prospective business requires a new facility to be built, the construction phase of the project will create a stimulus effect locally that can be captured in an economic impact analysis.

Once a new facility is operational, a business such as Google will spend money directly on certain items, including (1) payroll, (2) service contracts with local vendors, and (3) local purchases of supplies and equipment. When a business makes such direct expenditures, it sets in motion a series of additional spending flows throughout various sectors of the local economy. For example, the purchase of goods and services from local suppliers supports the hiring of workers at those firms and enables those firms to purchase additional inputs from their suppliers situated further down the supply chain. In addition, the company's employees earn salaries and wages, some of which they will spend on local goods and services in a wide variety of industries. That spending helps support workers in those industries who also will spend portions of their incomes locally, and so on. Using this logic, a typical economic impact analysis estimates the total impact of a change in economic activity[2] as the sum of effects on three different levels.

- *Direct effects* are the initial changes in employment, income, or output that trigger the first round of spending (e.g., the value of a firm's initial change in payroll or production).
- *Indirect effects* are the changes in employment, income, or output in subsequent rounds of re-spending that arise through purchases from local supplier industries (inter-industry purchases).
- *Induced effects* are created when payrolls increase and workers in affected industry sectors spend more on local goods and services (household spending effect).

1. The estimates produced by the N.C. Department of Commerce are measures of statewide impact, but many of these jobs will be created in the larger region surrounding Caldwell County.

2. A change in economic activity can be an expansion or a contraction. For example, an expansion might involve new business investment while a contraction can result from a sales decline, plant closing, or other reduction in business spending.

Taken together, the indirect and induced impacts can be thought of as the "ripple effect" of the initial change in economic activity. These additional impacts on a community or region can be estimated by applying a ratio called a multiplier to the direct effects of new economic activity.[3] The multiplier measures the total increase in employment, income, and/or output across all economic sectors per each new job created directly or per each dollar increase in earnings or business sales. The multiplier gauges how an initial change in consumption by end-users or "final demand" in one sector translates into changes in the wider economy.[4] A change in one sector of the economy affects many others.

The total economic impact, then, is the sum of the direct, indirect, and induced effects. Returning to the Google example, the total employment impact is estimated to be 582, which includes the initial employment of 210 that will be directly supported by the new facility. Based on these numbers, the employment multiplier for the Google project is 2.77 (582 divided by 210). The correct way to interpret Google's employment multiplier is that for every job the facility creates directly, an additional 1.77 new jobs will be created statewide.[5] In other words, Google's direct employment of 210 will produce an additional 372 indirect and induced jobs for a total employment impact of 582. While exceptions might exist, as a rule of thumb, multipliers will rarely exceed 3.0 at the state level and 2.5 at the local level. Multipliers much larger than this should be considered with caution.

Multipliers vary considerably by industry sector. Some industries have larger multiplier effects than others because they buy more of their inputs locally and sell goods outside the region. Industries that export or sell goods and services to businesses and households located elsewhere bring new money into the local economy. Thus, applying one standard multiplier to a project's direct effects is a rather crude way to estimate economic impacts. More precise estimates can be generated using advanced modeling techniques that take into account the varying degrees to which different industries purchase from local suppliers and export goods and services outside the local area.

Rather than simply applying one generic multiplier for all projects, input–output models estimate unique multipliers for individual industry sectors. Input–output models capture the trading patterns and money flows among the various sectors within an economy. By quantifying the purchasing transactions between industries, input–output models demonstrate how a change in one sector might affect numerous others throughout an economy.

Localized economic impact models such as RIMS II, IMPLAN, and REMI (discussed below) use mathematical equations to apply national data on inter-industry input–output linkages to states and localities. These models calibrate the input–output multipliers based on the size of the area being studied. Larger geographic areas such as states will have higher multipliers than counties or cities because their "leakage" rate is lower. Leakage occurs when some portion of new dollars is not re-spent in the local economy. Dollars will leak out at every round of spending

3. For a good discussion on multipliers, see Benjamin H. Stevens and Michael L. Lahr, "Regional Economic Multipliers: Definition, Measurement, and Application," *Economic Development Quarterly*, 1988, vo1. 2, no. 1: 88–96.

4. Cletus C. Coughlin and Thomas B. Mandelbaum, "A Consumer's Guide to Regional Economic Multipliers," *Federal Reserve Bank of St. Louis Review* 73, no. 1 (January/February 1991): 19–32. Also available at http://research.stlouisfed.org/publications/review/91/01/Consumer_Jan_Feb1991.pdf.

5. The multiplier ratio includes the direct employment which must be subtracted out to avoid double counting. The multiplier ripple effect of Google's 210 direct jobs is 372 additional jobs: 582 minus 210 or 1.77 multiplied by 210.

primarily because some purchases are made outside the local economy (imports), but also due to savings and tax payments. The larger a geographic area, the more likely it is that a new dollar will be re-spent within its boundaries.

Economic Impact Models and Software Applications

Short of employing a full-time regional economist, how can communities gain access to economic impact analysis when needed? While complex, large-scale projects might warrant hiring an external consultant, to assess projects on a case-by-case basis some communities opt to purchase industry-specific regional or local multipliers produced by the federal government. Others decide to make a longer-term investment in having this sort of analytical capability by purchasing a license to operate a commercially available economic impact model and software package. The most commonly used models for estimating the economic impacts of development projects are RIMS II, IMPLAN, and REMI. Each model has advantages and disadvantages, discussed below.

RIMS II

The U.S. Bureau of Economic Analysis (BEA) has created a methodology for estimating regional input–output multipliers called RIMS II (Regional Input–Output Modeling System). RIMS II "regionalizes" BEA's national input–output table by modifying it with data that capture local or regional industrial structure and trading patterns.[6] RIMS II provides industry-specific multipliers that users must apply to local project data in order to make economic impact estimates. It is not an automated model, such as those described below, with which users can interface directly to generate impact results. RIMS II provides users with a tabular list of (1) final-demand multipliers for output, earnings, employment, and value-added and (2) direct effect multipliers for earnings and employment. Final demand multipliers are used when the initial value of business output or revenues generated from a project is known. Direct effect multipliers are used when information on the initial employment and/or earnings directly associated with the project is accessible. Users can purchase multipliers for all available RIMS II industries for a particular region (one county or more) or a single industry for all states. This model is probably the most affordable option for conducting a basic economic impact analysis, but its methodology and functionality are not as robust as those of the models discussed below. For more information on the RIMS II system and its multipliers, visit www.bea.gov/regional/rims.

IMPLAN

An input–output model widely used to conduct economic impact studies is IMPLAN. IMPLAN is a commercially available software package that utilizes national input–output data for more than 500 industrial and commodity sectors to derive industry-specific multipliers for states and counties. The input–output data come from federal government sources including the U.S. Bureau of Labor Statistics and the Bureau of Economic Analysis and reveal the extent to which industries buy from and sell to one another in producing goods and services. In contrast to RIMS II, which merely provides users with a static table of multipliers, IMPLAN is a fully

6. Kenneth Poole, George Erickcek, Donald Iannone, Nancy McCrea, and Pofen Salem, "Evaluating Business Development Incentives," National Association of State Development Agencies, 1999. Also available at www.eda.gov/PDF/1g3_ebdi_report.pdf.

automated modeling system that uses built-in multipliers to estimate economic impacts. The IMPLAN software generates regional purchase coefficients in order to estimate the portion of demand for a good or service that is met locally.[7] IMPLAN is a static model and does not capture the dynamics of how a regional economy might change over time. It assumes, as most standard input–output models do, that wage levels, prices, property values, input costs, labor supply, productivity, and other key variables will remain constant.[8] As such, IMPLAN is not readily suitable for forecasting the effects of public policy changes.

The N.C. Department of Commerce uses the IMPLAN model in conducting many of its economic impact studies; some universities within the state have access to it as well. It is sold and supported by MIG Inc. (Minnesota IMPLAN Group). The IMPLAN software is available by license. The data files for geographic areas are sold separately. For conducting a standard economic impact study of a new firm locating in a particular region, the IMPLAN model is a reasonable choice. For more information, visit www.implan.com.

REMI

REMI (Regional Economic Models Inc.) Policy Insight is a sophisticated forecasting and simulation model that combines a robust input–output component to capture relationships between industries with three additional modeling approaches: (1) general equilibrium, (2) econometrics, and (3) New Economic Geography. The general equilibrium feature allows REMI to account for dynamic changes in the economy over time, such as fluctuations in prices, wage levels, migration, productivity, and the like. In this way, REMI takes into consideration the tendency of an economy to reach an equilibrium point where supply and demand are in balance. REMI uses econometric equations and advanced statistical techniques to quantify relationships between the variables in its model. The New Economic Geography aspects of REMI are reflected in equations that incorporate the spatial dimensions of a regional economy, such as the costs savings and other benefits that arise when firms and industries locate in proximity to one another. By integrating multiple modeling approaches, REMI goes well beyond standard input–output models such as RIMS II and IMPLAN to allow multi-year forecasting and advanced policy analysis. As a result, a license for REMI is significantly more expensive than for most other models. Visit www.remi.com for more information.

Summary Assessment and Limitations of Economic Impact Analysis

Economic impact analysis can provide valuable information about how a proposed development project will benefit a local or regional economy, as a whole, in terms of additional gains in employment, income, and business output. Such information about the economic benefits of growth and development is essential in helping public officials decide whether to invest public dollars in a project and in what amount.

The results of any economic impact model will be only as accurate and realistic as the assumptions and data used to produce them. While the underlying logic of economic impact

7. IMPLAN Version 3.0, released in late 2009, uses a new gravity model–based method for estimating regional trade flows that allows for more sophisticated, multi-region modeling.

8. Glen Weisbrod and Burton Weisbrod, "Measuring Economic Impacts of Projects and Programs," Economic Development Research Group, 1997. Also available at http://edrgroup.com/pdf/econ-impact-primer.pdf.

analysis generally is straightforward, the intricacies and complexities of individual models will vary, requiring users to have specialized knowledge and skills to calibrate the models and interpret their results correctly. For example, a novice user might not realize that standard input–output models have a significant limitation to the extent that they do not reflect how an economy adjusts over time to changes in macroeconomic conditions, regional industrial structure, public policies, and technological advances. More sophisticated, integrated models such as REMI address this shortcoming but are more expensive to operate and require greater user expertise.

One of the major concerns about economic impact analysis is that multipliers are often misunderstood and used inappropriately. The tendency to overstate the ripple effect of a development project by using multipliers that are too large can be lessened with prepackaged economic impact models such as those discussed above. When used "off-the-shelf" with their default values, different models are likely to produce widely varying multipliers for the same project in the same geographic area.[9] This inconsistency in estimating multipliers across models decreases when default values and assumptions are adjusted to better reflect local conditions.[10] Researchers have created benchmarked versions of RIMS II, IMPLAN, and REMI to control for variations in estimation methods and data sources and found no significant differences in the size of multipliers generated by the three models.[11]

In addition, standard, off-the-shelf economic impact models (with the exception of REMI) do not explicitly consider possible displacement impacts that could occur if a new firm competes directly with existing businesses for the same local customers. In this case the new firm gains at the expense of existing businesses and a smaller net impact on the jurisdiction results. For some projects, particularly in retail and certain service industries, the potential displacement effect can be significant.[12]

Perhaps the most significant limitation of economic impact analysis is that it represents only the economic benefits of a development project and does not address local government costs. Public officials must utilize the fiscal impact analysis techniques discussed in the next section to understand what effect a development project will have on the local government budget.

How Will a Development Project affect Local Government

Changes in economic activity can lead to predictable fluctuations in local government revenues and expenditures. Economic growth can boost public revenues, but it also can increase costs in the form of expanded public services. While some economic impact models can be adjusted to produce estimates for how a development project will affect tax revenues, the models discussed in this bulletin generally are not designed to measure the various costs to local governments

9. William Duncombe and Wilson Wong, "Building State and Local Government Analytic Capacity: Using Regional Economic Models for Analysis of Public Policy," *State and Local Government Review* 30, no. 3 (1998): 165–80.

10. Ibid.

11. Dan S. Rickman and Keith R. Schwer, "A Comparison of the Multipliers of IMPLAN, REMI, and RIMS II: Benchmarking Ready-Made Models for Comparison," *Annals of Regional Science* 29 (1995): 363–74.

12. George Erickcek, "Preparing a Local Fiscal Benefit–Cost Analysis," *ICMA IQ Report* 37, no. 3 (2005).

that come about as a result of growth and development. An economic impact analysis primarily emphasizes the economic benefits of a development project, but public officials must understand what a project will cost the local government as well.

A development project that expands economic activity in an area increases the demand for public services. For example, when a new business facility locates in a community, it will create an influx of new workers who will use public infrastructure (roads, water and sewer), enroll children in public schools, and utilize other public services such as fire and police departments, parks, libraries, and so forth. An economic impact analysis using one of the models previously discussed will not directly capture the extent of these costs, which local governments must incur to support growth. However, the data from an economic impact study can be used to estimate the costs of the additional public services that a new development project will require. From a local government fiscal perspective, a new business hiring more employees or a new housing development creates a ripple effect that can have significant budgetary implications. Thus public officials and decision makers should understand what the net fiscal effect of a particular economic development project will be.

Fiscal Impact Analysis

The most comprehensive way to determine how a development project will affect a local government is to conduct a fiscal impact study. A fiscal impact analysis estimates the costs of local government services needed to support a development project. The analysis considers the costs of development in relation to the public sector benefits such as new revenues from taxes, fees, and user charges. By addressing both the costs and benefits to local government, a fiscal impact analysis makes it possible to determine a project's *net* fiscal effect on a jurisdiction. With this information public officials can determine whether the public benefits (revenues) of a particular development project will exceed the costs incurred by local government, thereby creating a positive return on the public investment in that project.

Estimating the costs of development

The local government costs that arise from an economic development project are those directly related to the project plus any additional expenditures required to support the growth that ensues. Direct project costs might include (1) public infrastructure expenditures specific to the project, such as improvements in water and sewer systems and roads and (2) any cash incentive grants or other financial assistance used as an inducement for a prospective business. The direct, project-specific costs can be readily identified. The other costs associated with the expected growth that will occur in the jurisdiction and region due to the development project can be estimated in a fiscal impact study. Many such costs will correspond to various local budget expenditure categories that might include education, public works, public safety, parks and recreation, public health, social services, and so forth.

The two approaches to estimating the costs of any expanded local government services and infrastructure needed to support new development are *average cost* and *marginal cost.* The average cost approach is used most often because it is more straightforward and relies on data that are easier to obtain. Estimates based on average costs assume that what public services cost today is a good indicator of what they will cost in the future. The average cost approach calculates the current average cost per unit (person, household, or acre of land) of providing a local government service. This average cost per service unit is then applied to the additional units that

will need local government services as a result of the development project. The specific methods used to calculate average costs include the following:[13]

- The *per-capita multiplier* is the most common technique, in which the current cost of public services per resident, household, or pupil is multiplied by the expected increase in population, housing units, or school-aged children the new development will create. In practice, some analysts prefer to use a modified per capita approach that estimates the full-time equivalent *functional population* of a jurisdiction based on the amount of time people spend in a community as workers, residents, and/or visitors.[14] The functional population methodology accounts for the fact that persons who both reside and work in a jurisdiction require public services for a full 24-hour period, while those who just reside, work, or visit the jurisdiction will utilize services only for the portion of the day they are physically present.
- The *service standard* uses data for a comparable group of jurisdictions to derive ratios of average government staffing per person by functional service category. These service standard ratios are applied to the number of new residents anticipated as a consequence of a development project to determine the number of additional government employees that will be needed. This number is multiplied by the average operating cost per employee. The service standard approach is rarely used in practice.
- *Proportional valuation* is a technique for estimating the local government costs associated with nonresidential development.[15] Average costs are estimated by first determining the share of local government budget expenditures that goes to nonresidential land uses by multiplying the ratio of nonresidential real property valuation to total real property valuation by annual operating costs. The average local government operating costs for nonresidential land uses are then multiplied by the ratio of the new development's property valuation to that of all nonresidential real property.

The average cost approach makes sense to use when it is expected that historical cost patterns accurately reflect current and future service costs, a scenario more likely in communities with average or moderate growth rates. However, in a rapidly growing community with high service demands and an already strained public infrastructure, the costs of providing expanded services could very well be higher than the norm. Likewise, areas experiencing economic decline and

13. Robert Burchell, David Listokin, and William Dolphin, *The New Practitioners Guide to Fiscal Impact Analysis* (New Brunswick, N.J.: Center for Urban Policy Research, Rutgers University, 1985); George Erickcek, "Preparing a Local Fiscal Benefit–Cost Analysis," *ICMA IQ Report* 37, no. 3 (2005); L. Carson Bise, "Fiscal Impact Analysis: How Today's Decisions Affect Tomorrow's Budget," *ICMA IQ Report* 39, no. 5 (2007).

14. Arthur C. Nelson and James C. Nicholas, "Estimating Functional Population for Facility Planning," *Journal of Urban Planning and Development* 118, no. 2 (1992).

15. An alternative approach is to use a jurisdiction's "functional population" as the basis for determining how local government expenditures should be allocated between residential and nonresidential uses on any type of project. See Mary M. Edwards and Jack R. Huddleston, "Prospects and Perils of Fiscal Impact Analysis," *Journal of the American Planning Association* 76, no. 1 (2010). The idea is that a development project of any type—residential or nonresidential—will bring new people into a community who will require and utilize public services to varying degrees based on how much time they are physically present as workers, residents, or visitors. In addition, this change in population is more strongly linked to the actual provision of services, even for nonresidential projects, than proportional property values.

population out-migration may have underused public services and excess infrastructure capacity, which could make the cost of providing additional services lower than the average. Jurisdictions with excess capacity can absorb growth without necessarily having to spend money on capital improvements.

In the case of either rapid growth or decline, the marginal cost approach will produce estimates that more accurately represent the actual costs to local government of new development. Instead of assuming that these costs will be consistent with average costs and existing service levels, marginal costing considers the capacity of a jurisdiction's infrastructure and capital facilities in determining the incremental cost of serving one more unit. Specific methods for estimating the marginal costs of providing additional local government services include the following:[16]

- *Case study* analysis requires detailed information about the existing capacity of a jurisdiction to meet new public service demands. This method relies on interviews with local government department heads to identify either excess capacity or strain on public services and infrastructure and to collect data on the cost to expand services to accommodate the growth expected from a development project. This method assumes that information about actual local service levels and capacity is more accurate than standards based on average data. The case study method can produce detailed and precise results but can be time-consuming and expensive. Most analysts prefer this method despite the possibility that department heads will overstate projected costs to generate more funding for their units.
- *Comparable city analysis* relates local government costs to population trends among communities with similar demographic characteristics. Local government expenditure ratios (multipliers) based on the population sizes and growth rates of comparable communities are used to estimate how changes in population arising from new development will affect the marginal costs of public services. The goal is to account for the varying effects of population changes within communities of different sizes in deriving expenditure patterns to use as the basis for estimating future local government service and capital costs. In practice, the comparable city approach is rarely used.
- *Employment anticipation* can be used for nonresidential development to estimate future local government costs based on expected changes in employment. This method examines the relationship between employment and local government costs per capita by applying statistical coefficients generated with multivariate regression to the jobs anticipated to result from new development. These coefficients, or "employment anticipation multipliers," have been calculated for standard expenditure categories and represent the effect of one new industrial or commercial employee on local government service costs. The employment anticipation technique is rarely used.

16. Robert Burchell, David Listokin, and William Dolphin, *The New Practitioner's Guide to Fiscal Impact Analysis* (New Brunswick, N.J.: Center for Urban Policy Research, Rutgers University, 1985); George Erickcek, "Preparing a Local Fiscal Benefit–Cost Analysis," *ICMA IQ Report* 37, no. 3 (2005); L. Carson Bise, "Fiscal Impact Analysis: How Today's Decisions Affect Tomorrow's Budget," *ICMA IQ Report* 39, no. 5 (2007).

Estimating the public benefits of development

Fiscal impact analysis considers whether a development project will have a net positive effect on a local government budget by generating public benefits that exceed the operating and capital costs that will be incurred to provide expanded public services. The public sector benefits resulting from growth and development are the increased revenues from property and sales taxes, fees, user charges, utilities, and intergovernmental transfers. Different types of development projects will affect these various sources of revenue in different ways. For example, a major retail project might be expected to boost sales tax revenues to a greater extent than would a new industrial facility. However, for a given development project, it is important to determine where new residents and workers will live and shop and how they will affect the value of housing in order to know which revenues will be most affected.[17] It is also helpful to know the proportion of any new jobs that will go to existing residents versus in-migrants in determining the extent to which local government revenues will exceed costs. If most of the new jobs are taken by in-migrants, the revenue impact will be diminished by the higher service costs associated with population growth.[18]

The technique used to estimate a particular revenue stream will depend on the revenue source and how it is generated locally. The property tax is the most common local government revenue source. Growth-related changes in property tax revenues are estimated by applying the local property tax rate to the projected valuation of taxable property to be added in the jurisdiction due to the new development. One way to estimate changes in other revenues stemming from growth is to allocate the different categories of revenue to land use types (residential or nonresidential) and divide by the existing total population and local employment.[19] The calculations will produce two figures: (1) residential revenues per capita, which is multiplied by the increase in new residents expected from new development and (2) local nonresidential revenues per worker, which is multiplied by the number of new employees the development project will create. Revenues shared with other jurisdictions, such as the North Carolina sales tax, are distributed based on formulas (per capita and/or ad valorem) that revenue estimates must take into account.

The revenue benefits for and costs to a local government resulting from a development project may not occur within the same time period.[20] In many instances, a local government will make expenditures on project-specific infrastructure improvements and cash incentives up-front, while new tax revenues may not materialize until much later in the project's life. Therefore, decision makers must be able to estimate the future stream of benefits relative to the more current expenditures. One way to do this is to discount the value of public benefits and revenues

17. George Erickcek, "Preparing a Local Fiscal Benefit–Cost Analysis," *ICMA IQ Report* 37, no. 3 (2005): 11.

18. Kenneth Poole, George Erickcek, Donald Iannone, Nancy McCrea, and Pofen Salem, "Evaluating Business Development Incentives," National Association of State Development Agencies, 1999. Also available at www.eda.gov/PDF/1g3_ebdi_report.pdf.

19. Mary M. Edwards, "Community Guide to Development Impact Analysis," Wisconsin Land Use Research Program (2000): 20. Also available at www.lic.wisc.edu/shapingdane/facilitation/all_resources/impacts/CommDev.pdf.

20. George Erickcek, "Preparing a Local Fiscal Benefit–Cost Analysis," *ICMA IQ Report* 37, no. 3 (2005).

that occur in later years using a net present value calculation.[21] This is necessary because future revenue streams will be worth less in five or ten years than those received today due to the time value of money.[22] Paying attention to the timing of revenues and costs over the life of a project can pinpoint where numbers might need to be adjusted to express in real terms the value of the public benefits and outlays expected in later years. Public officials should consider the net present value of cash flows when determining the "payback period" (years it will take to recoup project expenditures) for incentives and other public investments.

Fiscal Impact Models and Software Applications

There are a few prepackaged models and web-based applications available to use in conducting a fiscal impact analysis of an economic development project. These models and applications help reduce the guesswork associated with estimating the local government costs and benefits that result from growth by providing a template for the data needed and confirmation of the assumptions behind the estimates. Two available fiscal impact packages designed for use on economic development projects are discussed below.

FedFIT

The Federal Reserve Fiscal Impact Tool (FedFIT) is a set of spreadsheets that produces estimates of how a development project will affect local government revenues and costs. FedFIT is essentially a computer-based calculator that guides users through the steps and assumptions required to quantify the fiscal impacts of new development. The tool's creator candidly acknowledges its limitations to the extent that "[i]t does not purport to allow analysis with a high level of precision, but seeks to give only a rough picture."[23]

To estimate local government revenues with FedFIT, users must input information about (1) the development project, such as new employment, average salary, the market value of real and personal property and (2) the jurisdiction, such as sales and property tax rates. The model's default for deriving cost estimates is to apply historical average expenditures per capita by service function to expected population changes (number of new residents). Users can opt to override the default approach and enter more precise information about the costs related to the new development. The model also includes a number of default assumptions about retail leakage out of the area, in-migration, school-aged children per new family, and the like, which the user can modify. The application includes historical data on retail sales, number of business firms or establishments, labor force and employment, population, and income, which can be used as contexts for interpreting results. FedFIT is available free of charge via e-mail or CD. Visit www.federalreserve.gov/forms/fiscalimpactrequest.cfm.

21. Michael J. Mucha, "An Introduction to Fiscal Impact Analysis for Development Projects," (white paper, Government Finance Officers Association, 2007), www.gfoa.org/downloads/FinanicalImpactAnalysis.pdf.

22. The time value of money refers to the preference for receiving money now rather than later. Money in hand today is more valuable than the same amount received in the future because it can be invested and earn interest.

23. Dan Gorin, "The Federal Reserve Fiscal Impact Tool," *Research Review* 12, no. 2 (2005): 66. Also available at www.icsc.org/srch/rsrch/researchquarterly/current/rr2005122/Federal Reserve Fiscal Impact.pdf.

WebLOCI

WebLOCI is a web-based application available by license through the Georgia Tech Enterprise Innovation Institute. WebLOCI is a fiscal impact tool that includes a simple component for estimating economic multiplier (indirect) effects. WebLOCI does not include industry-specific multipliers as a built-in feature. Including the indirect effects of a development project in a fiscal impact analysis requires the user to either enter average multiplier ratios derived from an input–output model or estimate how much of a firm's inputs are purchased locally. Though the economic multiplier function of WebLOCI is limited and may be prone to user error, users can add the indirect economic (multiplier) effects to the application's estimates of total fiscal impact. WebLOCI also enables users to conduct fiscal impact analysis for municipalities, while many prepackaged models cannot be used at a subcounty level. WebLOCI employs the per capita (household) method for estimating local government costs. For more information on the software application and model, visit http://webloci.innovate.gatech.edu.

Cost of Community Services (COCS) Studies

Some communities want to know generally how different types of land uses might affect local government budgets. For these communities, a cost of community services (COCS) study can provide insight into the net fiscal impact of broad categories of land uses—agricultural, residential, commercial, and industrial.[24] The American Farmland Trust developed the COCS approach to enable communities to measure the contribution of agricultural open space land uses to the local tax base. As an alternative to traditional fiscal impact analysis methods, the COCS approach is a relatively straightforward way to determine the extent to which different land uses generate a positive net fiscal return.

In a COCS study, current revenues and expenditures from a local government budget are allocated to broad land use categories based on expert opinion, particularly interviews with department heads and budget and finance staff. The COCS ratio compares total revenues to expenditures for each type of land use. A ratio of greater than 1.0 indicates that a respective land use more than pays for itself by contributing in tax revenues an amount that exceeds the costs of the public services it receives. COCS studies conducted throughout the United States consistently show that industrial, commercial, and agricultural land uses have revenue–expenditure ratios above 1.0. Conversely, these studies find that residential land uses have ratios that are almost always less than 1.0, meaning that fiscally they are a net drain.[25]

In contrast to traditional fiscal impact analysis, which estimates how a specific proposed development project and future growth will affect the local government budget, COCS is based on current revenues and expenditures for broad types of land use at a point in time and does not capture changes in population or economic activity. In this sense, COCS studies do not measure the fiscal impacts of growth and new development as such.[26] However, by indicating generally whether certain land uses, on average, run a net fiscal surplus or deficit, COCS studies can provide baseline information for making decisions about future development. There

24. Professor Mitch Renkow, an economist at North Carolina State University, has conducted COCS studies for counties in North Carolina, including Chatham, Orange, Alamance, Wake, and Henderson. See www.cals.ncsu.edu/wq/lpn/cost.html.

25. See "American Farmland Trust Cost of Community Services Fact Sheet" at www.farmlandinfo.org/documents/27757/COCS_8-06.pdf.

26. Timothy W. Kelsey, "The Fiscal Impacts of Alternative Land Uses: What Do Cost of Community Service Studies Really Tells Us?" *Journal of the Community Development Society* 27, no. 1 (1996).

could be exceptions to the average COCS ratio within a particular category of land use, however. For example, aggregating all residential land uses together can mask the fact that housing for families with school-aged children typically requires more public services than housing units for empty nesters and retirees.[27]

Summary Assessment and Limitations of Fiscal Impact Analysis

As a method for determining the cost of economic growth and development to local government, fiscal impact analysis is an indispensible tool. Fiscal impact analysis can aid the decision-making process by helping a jurisdiction assess and quantify service levels and needs, evaluate the capacity of capital facilities and infrastructure, consider alternative development scenarios, and otherwise prepare for change (growth or decline).[28] Connecting growth and development decisions to budgetary and capital planning considerations is an important way fiscal impact analysis makes such decisions more thoughtful and systematic. Also, when it accounts directly for the costs of business incentives offered for a development project, fiscal impact analysis provides a more comprehensive assessment of the public sector's return on investment.

Using fiscal impact analysis appropriately requires an understanding of its limitations. In isolation, fiscal impact analysis provides information only about local government costs and revenues and does not explicitly examine how a development project will affect the larger economy in terms of business output, employment, and income. A project's economic and private benefits can be substantial even if it runs a net fiscal deficit relative to the local government budget. Moreover, fiscal impact models vary in the extent to which they consider the secondary or indirect economic effects of a development project, if they do so at all. Other limitations of fiscal impact analysis include misapplication of costing methods by users, exclusion of social and environmental impacts, failure to measure cumulative effects over time, and the tendency to focus on a single unit of local government and ignore the impacts on overlapping and neighboring jurisdictions.[29] Finally, some research demonstrates that different fiscal impact methods will produce different results.[30] Therefore, decision makers should carefully consider the assumptions underlying each respective method and how each translates growth into costs and revenues for a particular development project.

What about Qualitative Impacts?

The typical approaches to economic and fiscal impact analysis do not address how growth and development might affect a community in ways that are difficult to quantify. For example, a development project can provide hope that prosperity will return to communities hard hit by job loss. It can restore self-respect to unemployed workers who need jobs to support their families. These socio-psychological benefits of development will not appear in the numbers produced by an economic or fiscal impact study. Likewise, these studies may not necessarily

27. Ibid.

28. L. Carson Bise, "Fiscal Impact Analysis: How Today's Decisions Affect Tomorrow's Budget," *ICMA IQ Report* 39, no. 5 (2007).

29. Zenia Kotval and John Mullin, "Fiscal Impact Analysis: Methods, Cases, and Intellectual Debate" (working paper, Lincoln Institute of Land Policy, 2006), www.lincolninst.edu/pubs/dl/1252_Kotval%20Mullin%202%20Final.pdf.

30. Mary Edwards, "Fiscal Impact Analysis: Does Method Matter?" *Journal of the Community Development Society* 32, no. 1 (2001): 106–129.

capture negative externalities and other unintended consequences such as traffic congestion and environmental pollution, which can harm a community's quality of life. Of course, some development projects can enrich the quality of life in ways that a traditional impact analysis would ignore, such as by enhancing arts and cultural amenities.

Conclusion

An economic development project can create tangible benefits for local or regional economies and real costs and revenues for local governments. Public officials must understand both types of impact—economic and fiscal. In this sense, the economic and fiscal impact methods discussed in this bulletin are complementary approaches; they both provide critical information needed to make sound public investment decisions about economic development. When used separately, each approach only partially reveals the potential impacts of growth and development. Local governments might consider including some basic level of impact analysis as part of the standard due diligence conducted for routine development projects. Small-scale projects might not necessitate the time and costs required to conduct a comprehensive and highly detailed analysis. However, most major development projects will likely warrant an integrated approach that combines economic and fiscal impact analyses. Indeed, a local government should probably link its fiscal impact model directly to an economic impact model whenever possible.

Some newer prepackaged models combine economic and fiscal impact analyses in one software application. Impact DataSource, a consulting firm based in Austin, Texas, offers two versions of an integrated model: Quick Impact and Total Impact. The model is a Microsoft Excel–based program that uses RIMS II multipliers to calculate economic impacts and uses local tax rates and average service costs per household and pupil to translate these impacts into additional local government revenues and costs. The model calculates the net fiscal impact (benefits minus costs) of a development project and discounts net benefits to reflect their present value. In addition, the model enables users to calculate the rate of return on any incentives offered to a business and the number of years necessary to recoup the incentives (payback period). The model does not produce results with the extensive industry detail of IMPLAN or REMI and is not designed to conduct dynamic, advanced regional analysis. However, the model is user-friendly and its combination of economic and fiscal impact analyses can help public officials better understand how an economic development project will affect both the local economy and the local government. The Quick Impact version of the model produces economic and fiscal impact analyses for only one taxing district while the Total Impact version can provide results for multiple jurisdictions. Both versions are available by subscription. For more information, visit www.impactdatasource.com.

Table 1, on page 15, compares features of the six impact analysis tools discussed in this bulletin. Despite their limitations, when used appropriately these tools will, more often than not, yield results that are more credible and accurate than the "back of the envelope" calculations so often used to "guesstimate" the impacts of development projects. The available models and software applications take some of the guesswork out of the process by providing a template for the data and information that the user will supply. A learning curve is required, however, to avoid treating the models as "black boxes" that will generate numbers with a few quick keyboard strokes. The most meaningful impact results are generated when users understand how to tweak

Table 1. Comparison of Economic and Fiscal Impact Models

	RIMS II	IMPLAN	REMI Policy Insight	FedFIT	WebLOCI	Quick Impact and Total Impact
Type of model	Input-output multipliers only	Static input-output modeling system	Dynamic regional economic and policy modeling system	Fiscal impact calculator	Fiscal impact	Economic and fiscal impact
Level of geography	Counties, states, regions	Counties, states, zip codes	Multi-county regions, states	Counties, cities	Counties, cities	Counties, cities, states
Estimates indirect economic effects	No, but the multipliers can be used to do so	Yes	Yes	Yes (not primary function)	Yes (not primary function)	Yes
Estimates local govt. revenues and costs	No	No	No	Yes	Yes	Yes
Incentives analysis (return, payback period)	No	No	No	Yes	Yes	Yes
Calculates net present value	No	No	No	Yes	Yes	Yes
Format	Viewer file or spreadsheet	Desktop application	Desktop application	Excel workbook	Web-based application	Excel-based application
Major strengths/ advantages	Affordable and accessible	Level of industry detail; multi-region modeling	Robust forecasting and policy analysis capability	Accessible and easy to use	Provides detailed cost estimates	Integrates economic and fiscal impact analyses
Limitations/ shortcomings	No built-in modeling capability	Ignores dynamic changes in the economy over time	Expensive and complex	Default values may not produce precise results	Requires users to input a large amount of data	Lack of industry detail and advanced modeling capability
Pricing/ subscription fee	$50 per industry or $225 per county or region (no subscription required)	$2,665 for NC package	$46,000, then $10,000 annually $23,000 for a one-year rental $18,500 for a six-month rental	Free	$450, then $200 annually	$3,000–$5,000
Vendor	U.S. Bureau of Economic Analysis	Minnesota IMPLAN Group Inc.	Regional Economic Models Inc.	Federal Reserve Board	Georgia Tech Enterprise Innovation Institute	Impact DataSource

the default assumptions of prepackaged models to better reflect local conditions and the details of a particular project.

Finally, some local government officials might wonder where they can find assistance with conducting or gaining access to economic and fiscal impact analyses. Economic development professionals may provide a basic assessment of a project's economic or fiscal impacts, or both. But the analysis of such a professional might not be purely objective since his or her job performance is dependent upon making projects happen. Project boosters and other advocates may not be the best source for independent and unbiased analysis of development impacts. If resources permit, a jurisdiction might consider purchasing or leasing a model or a software application through a commercial vendor for use on a regular basis. In addition to the initial financial investment, operating an impact model internally requires an organizational commitment to ensuring staff members possess the necessary knowledge and skills to conduct the analysis and accurately interpret its results. For infrequent, large-scale projects a local government may find it helpful to contract with a private consulting firm, university professor, or other external expert to assist with performing a development impact analysis. In contrast to some states, however, North Carolina has no centralized resource for systematically assisting localities with impact analysis.