Dynamic Analysis of Targeted Tax Credits

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DYNAMIC ANALYSIS OF TARGETED TAX CREDITS

This report presents results of a dynamic analysis of the economic impact of using targeted tax credits to encourage venture capital investment in the state of Connecticut. Northington Partners, Inc., of Avon, Connecticut, commissioned the Connecticut Center for Economic Analysis at the University of Connecticut to conduct this study. The Center houses the State Economic Model, a sophisticated 53 sector replication of the state's economic structure which can project economic impacts out over as many as thirty years. The analysis presented here looks at the impacts over a period of twenty years, with the year 2000 as the starting point. The objective is to determine the net benefits to the state, in terms of increased employment, gross state product (GSP), personal income, and tax revenues, if it underwrites this investment with tax credits of 10% annually for four years, beginning in the fourth year after the initial investment, and then 20% annually for the next three years, thus totaling 100% of the investment in tax credits spread over the first ten years of the investment.

The analysis uses two different approaches. The first assumes that all investment will be funneled into job creation with existing infrastructure – in other words, none of the funds will be used explicitly for new construction, though there is some induced investment based on known labor-capital ratios. The second has a separate construction stage at the beginning of the investment project. In both cases, the analysis computes the aggregate economic impact (benefit) to the state's economy and then compares the present value of resulting increases in state tax revenues with the present cost in lost revenues resulting from the tax credits.

The analysis considers the Finance, Insurance, and Real Estate (FIRE) sector as a potential target for this investment, as classified by two-digit SIC codes.[*] FIRE is a composite of several sectors at the 2-digit level: banking, insurance, investment services, and real estate sectors. The banking sector (SIC code 60) consists of both depository institutions and non-depository credit institutions. The insurance sector (SIC code 63, 64) includes insurance carriers (SIC code 63), agents, brokers and services (64). Investment services embraces security and commodity brokers (SIC code 62) and non-depository holding and investment offices (61, 67). The real estate sector (SIC code 65) includes real estate, royalties, and owner-occupied dwellings.

The model makes conservative projections. There is no adjustment increasing the size of the public sector as a result of increased tax collections; the size of the public sector does adjust to the increase in population. Also, employment growth presumes that new workers and dependents move into the state, rather than coming from currently unemployed individuals. But insofar as new employment in fact reduces state unemployment, and even reaches into the ranks of those currently on welfare, the model *understates* the benefits that flows from the proposed investments. Given these considerations, the projections provided below should be understood as lower bound estimates of likely impacts.

APPROACH 1

The first sets of analyses have no initial construction phase, relying primarily on existing facilities to accommodate initial job creation resulting from the investment. We model this initial job creation as a "shock" to the state's economy. We assume that the investment creates 2000 jobs directly: 1000 in the year 2000, another 500 in each of the next two years. These jobs are new to the state's economy and are filled by workers coming from out of state. We allow for future investment as a result of the employment – the state's capital stock can rise as the initial employment induces further investment.

For this sector, the analysis looks at two scenarios: one in which the investment is a one-time infusion of $190 million into the economy; the other where the same funds are infused gradually over three years. For the gradual

[*] SIC is the acronym for Standard Industrial Classification; it is the system under which the U.S. Department of Commerce classifies all aspects of the American economy.

investment, we considered the case in which 50% of the entire amount is invested the first year, followed by 25% each the next 2 years. In each case, we assumed the initial investment is made in the year 2000 and the tax credits begin in 2003. Tax credits are 10% for years three to six following the investment and 20% for the years seven to nine following the investment. This means that with a one-time infusion, they would run from 2003 to 2009, and from 2003 to 2011 with investments spread over three years. The dollar amount of the tax credits will thus vary for each scenario. The table below gives the resulting tax credit structures.

Table I: Tax Credits by Year
(Millions $)

Y	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Tax Credits Onetime Investment	$0.00	$0.00	$0.00	$19.00	$19.00	$19.00	$19.00	$38.00	$38.00	$38.00	$0.00	$0.00
Tax Credits Gradual Investment	$0.00	$0.00	$0.00	$9.50	$14.25	$19.00	$19.00	$28.50	$33.25	$38.00	$19.00	$9.50

This analysis identified the impact of this project on a variety of economic variables, of which the most significant are employment, Gross State Product (GSP), personal income and population. The table below presents the results for each of these variables in terms of their net impact on the Connecticut economy. That is, the table shows the increases in annual average aggregate levels that flow directly and indirectly from the proposed investment over twenty years compared to a baseline (status quo) forecast of the economy's performance.

Table II: Net Increases in Selected Economic Variables due to Investment in the FIRE Sector

Economic Variable	Average Annual Impact
Employment	5,092
GSP (Billions 92$)	0.9702
Personal Income (Billions Nom $)	0.56347
Population	7,189

Table II shows that employment in Connecticut would increase by an average of approximately 5092 jobs per year. GSP increases annually by almost a billion dollars (1992$), and personal income rises by $563.4 million per year. The state's population increases by over 7000 per year.

The study also evaluates the effects of the projected investments on state tax revenues. Table III gives present values for both future tax collections (over twenty years) and tax credits resulting from the proposed investment. The present value of new taxes includes future income taxes, sales and use taxes, and corporate profit taxes which the proposed investment generates directly and indirectly; these are then offset against the present value of the relevant tax credits. The comparison shows that gradual investing yields a greater return to the state than the one-time investment.

Table III: Present Value of New Tax Revenues and Credits due to Investment in the FIRE Sector
(Millions $)

	One-time Investment	Gradual Investment
Present Value Of Total New Taxes	**$598.63**	**$598.63**
Present Value Of Tax Credits	**$131.74**	**$127.11**
Present Value Of Net New Taxes	**$466.88**	**$471.51**

APPROACH 2

The second approach to assessing the impact of the proposed investment begins with a construction phase. We assume the construction takes place over two years, in 2000 and 2001, after which the same job creation pattern takes place as in Phase 1. Therefore the initial increase of 1000 jobs takes place in 2002, followed by an additional 500 jobs in 2003 and another 500 in 2004. Because in this scenario we include construction specifically, we do not have subsequent capital investment to support the increases in employment.

The construction phase is funded with $100 million in the year 2000 followed by $90 million in 2001. As before, the tax credits are structured to amount to 100% of the investment amount over seven years, beginning three years after the investment, with credits of 10% for four years and 20% for the next three. Tax credits begin the fourth year after commencement of the project. Given the expenditure pattern, Table IV shows when and in what amount this investment scenario would earn tax credits.

Table IV: Tax Credits by Year
(Millions $)

Y	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Tax Credits	$0.00	$0.00	$0.00	$10.00	$19.00	$19.00	$19.00	$29.00	$38.00	$38.00	$18.00	$0.00

This approach produces one investment scenario. Table V below shows the impact of the proposed investment on several key economic variables. The table below presents the results for each variable in terms of its net impact on the Connecticut economy. That is, the table shows the average increases in aggregate levels per year that flow directly and indirectly from the proposed investment over twenty years.

Table V: Net Increases in Selected Economic Variables due to Investment in the FIRE Sector (with construction phase)

Economic Variable	Average Annual Impact
Employment	4,521
GSP (Billions 92$)	0.8737
Personal Income (Bil Nom $)	0.514042
Population	6,210

The analysis shows that annually, employment increases by an average of over 4500 positions, GSP by over $800 million (1992$) and personal income by $500 million. Population also increases by more than 6000.

Table VI shows the results of the investment scenario for new tax collections and the comparison between such revenues and the cost of tax credits. The state earns net revenue of $397 million with the investment in the FIRE sector.

Table VI: Present Value of New Tax Revenues and Credits
(Millions $)

Present Value Of Total New Taxes	**$526.49**
Present Value Of Tax Credits	**$128.77**
Present Value Of Net New Taxes	**$397.72**

150% TAX CREDIT SCENARIO

The above scenarios all involve structured tax credits equal to the amount of the original investment. Certain sites such as brownfields however incur additional costs in the development process. To encourage investment in such sites, it may be worthwhile to consider offering higher incentives to potential investors. We modeled a structured tax credit scenario equal to 150% of the original investment as an example of such an incentive scheme. The results are attached to the end of this report.

CONCLUSION

Through provision of structured tax credits to selected economic sectors, the State of Connecticut can clearly generate significant benefits, measured in terms of job creation, growth in total state product, increases in personal income, and gains in population. Thus, the rate of return exceeds three dollars back for every dollar “invested” in tax credits for the FIRE sector. But such credits must be targeted intelligently: carefully structured investments channeled through professionals should yield consistently positive results.