18 Technology and Economic Development for Whom?: The Prospects for "Dual Agenda" State Programs

Barry Bozeman

The public policy holy grail is the "win-win" policy, one resulting in many beneficiaries and no discernible losers. Few such policies exist, of course. Most public policies set priorities among competing interests. During the past decade, one of the best places to look for the "win-win" policy has been states' technology-based economic development programs. These programs are popular with taxpayers, receive favorable press, and have broad-based and highly enthusiastic political clientele. For some reason, the states seem largely immune to the charges of "corporate welfare" or "industrial policy" so often levied at federal technology-based economic development programs. In most states, the programs are perceived as "win-win" and often are the apple of the governor's eye. To be sure, the commitment of resources to these programs rarely matches the rhetoric. Only a few states actually have significant (from a budget standpoint) technology-based economic development programs, but in almost all states, regardless of the true level of resources committed, the programs receive considerable attention.

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Well they should. My own perspective on state technology-based economic development (TED) programs is that of an evaluator. Having evaluated such programs in many states, including, among others, Iowa, New York, New Mexico, Georgia and California, I am one of the people who has provided tangible data indicating that there are often good reasons for trumpeting positive results. States' TED programs often work and their impacts generally are demonstrable. True, the programs sometimes do not have the type of impacts most popular with elected officials—massive job creation and substantially augmented state revenues. But knowledgeable and realistic supporters of TED programs find many things to like, including, particularly, increasingly favorable perceptions of the business climate of the state (Niemi, Bremer and Heel, 1999), beneficial linkage of educational and business institutions (Feller, 1997; 1992), and the support of significant number of new business ventures as well as the retention of old businesses retained (Shapira and Youtie, 1998). Even the unfortunate tendency of some state officials to provide wildly exaggerated, poorly documented claims about the TED programs fails to undermine the demonstrable accomplishments. As an evaluator, it is a delight to find public programs that work (not that uncommon) and that most people seem to like (quite uncommon).

My comments here introduce a dissonant note. In conventional terms, states' TED programs have proved successful. But are the "conventional terms" the right ones? Most states have two quite different and rarely joined economic agendas, one economic development the other economic-social. From the standpoint of economic development—new companies, high paying jobs, wealth creation—TED programs often do a lot with a little. But few such programs even address the economic social agenda—income inequality, poverty, racial and class divide. Should they?

Two Agendas: Economic Growth and Economic-Social

Using the evaluative criteria and methods typical for TED evaluations (Youtie, Bozeman and Shapira, 1999), many of the states TED programs look very good. Few produce enormous objective changes in states' economies (see Feiock, 1991; Goss and Phillips, 1997; Grant and Wallace, 1994). But if one considers the relatively small amount of money invested in such programs—generally much less than one percent of the state's budget—many seem a good investment, yielding much more in benefits than the programs cost. Since none of the TED programs are large, they tend to rely on strategic deployment of funds, industry match-

ing, and seed money. Generally, they take small amounts of money and do small, good things. Sometimes, much less frequently, they do large good things. But for whom do they do these good things?

It seems to me that the TED programs are by now sufficiently mature that we can, on the one hand, count them as generally successful, and, on the other hand, ask if they can do more. Rather than spending time and energy documenting unrealistic claims about tens of thousands of new jobs, perhaps the TED programs can garner more support by expanding the set of beneficiaries. In most states, the rate of growth for TED programs leveled off some time ago (Eisinger, 1995) and strategies of inflating accomplishments and stepping up the intensity of business lobbying have not done much to affect a flatter growth curve. One possible "win-win" program *strategy* is to expand the base of support by expanding the distribution of benefits from TED programs.

While I hold to my claim that the states' TED programs are generally quite popular, there has always been some dissent about the programs and their effects. Often, the dissenters are viewed as Luddites. Views about TED programs do often seemed to be bifurcated. In most states the vast majority of the electorate is has no knowledge whatsoever about TED programs. But among the attentive, there are often sharp splits between those who are enthusiastic advocates and those who criticize TED programs. Generally, the critics do not seek to cast doubt on the accomplishments of TED programs but to bring attention to a different set of priorities. If one's agenda for state policy includes economic growth, expanded revenues, import of capital, successful business start-ups and full utilization of the scientific and technological resources of the state, then advocacy of TED programs is almost sure to follow. However, if one's agenda is closing the income distribution gap, improving the lives of the disadvantaged, addressing the needs of the hard core unemployed, and redressing inequitable educational opportunities, then TED programs are likely to be seen through a quite different lens. Doubtless some see (however unrealistically) the funds invested in TED programs as substantial and as a threat, or at least a significant opportunity cost, for the economic-social agenda. If one is interested in the economic-social agenda, current programs seem highly attractive only if one embraces a "trickle down" theory. That is, if one is willing to assume that TED investments are not middle- and upper-income entitlement programs but also benefit persons in lower income echelons, then the TED program is "win-win" for the economic-social agenda as well. Unfortunately, the job creation evidence from evaluations of TED programs

almost always disappoints (the more careful the study, the more it disappoints) and the relatively few jobs that are created are generally not ones for which lower- and lower-middle wage earners qualify. In short, "trickle down" is a hard sell. Evidence suggests that state economic development programs often succeed in creating wealth but have only modest effects impact on job creation and unemployment patterns (Feiock, 1991; Grant and Wallace, 1994; Binghamn and Bowen, 1994).

Before assessing the advantages and disadvantages of TED programs taking on a dual agenda, I present a mini-case study of the State of Georgia's TED programs. It is an interesting case because the economy is booming, the TED programs are popular and, at the same time, income inequality is increasing rapidly.

Georgia: A Mini-Case Study

The State of Georgia and the City of Atlanta present an excellent case study for considering the two agendas, economic growth and economic-social. Let us consider the assessment of a leading economist (Downs, 1994, p. 26) who recently did a study for the Atlanta Regional Commission.

> The Atlanta region enjoys unusually favorable conditions compared with most other U.S. metropolitan areas. It has higher incomes, a more attractive physical environment and climate, a better transportation network, more harmonious race relations, and prospects for much faster growth. *If any big U.S. metropolitan area can surmount the key problems facing all of them—crime, children being raised in poverty, low-quality public education, lack of regional governance, and huge income disparities—Atlanta should be the place.* [italics mine].

In this "mini-case study" I am going to review briefly some of Georgia's TED programs and present some data on income distribution. This will not, of course, tell us much about the relationship of one to the other. I am willing to assume there is not much relation. The TED programs are neither a cause nor a remedy to income disparities or, more broadly, to Georgia's and Atlanta's disappointing level of progress on its economic-social agenda. I juxtapose these data in order to pose this question, elaborated below, "Should there be an attempt to latch together the two economic agendas?"

Let me begin with a brief profile of Georgia and its economy and a little bit about why it's booming. Georgia ranked 11th in population in

Table 1
Resident Population, Georgia and the United States
1980–2000 (projected)

	Population in Thousands					
	1980	**1985**	**1990**	**1995**	**1997**	**2000**
United States	226,546	237,924	248,765	262,761	267,636	274,634
Georgia	5,463	5,963	6,478	7,192	7,486	7,875
Georgia's % of United States	2.41%	2.51%	2.60%	2.74%	2.80%	2.87%

Source: Statistical Abstract of the United States, 1998; Table 26—Resident Population—States: 1970–1997; Table 35—State Population Projections: 2000–2025.

Table 2
Gross Products of Georgia, Southeast, and the United States

Gross Products of Georgia, the Southeast and the United States, Selected Years
In Millions of Current 1996 Dollars

	1980	1985	1990	1995	1996
United States	4,575,488	5,249,648	6,022,228	6,817,342	7,117,515
Southeast	936,329	1,091,468	1,259,138	1,491,319	1,555,303
Georgia	97,837	126,821	149,824	188,285	199,430

Southeastern Gross Product as a Percentage of the United States Gross Domestic Product

	1980	1985	1990	1995	1996
Southeast	20.46%	20.79%	20.91%	21.88%	21.85%

Georgia's Gross State Product as a Percentage of United States and Southeastern Gross Products

	1980	**1985**	**1990**	**1995**	**1996**
United States	2.14%	2.42%	2.49%	2.76%	2.80%
Southeast	10.45%	11.62%	11.90%	12.63%	12.82%

Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Analysis Division. Southeast Includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia.

1997 with 7.5 million residents and is projected to have 7.9 billion residents in 2000, or about 2.87% of the U.S. population (see Table One). In 1996, the gross state product was nearly $200 billion (Table Two).

The State of Georgia Technology-Based Economic Development Initiatives

Georgia allocated $51.7 million to R&D-based technology development programs. While this pales in comparison to state expenditures on education, the criminal justice system and other "big ticket" items, it is nonetheless one of the more significant states. Briefly, let us review the primary initiatives under Georgia's TED program.

Traditional Industries Initiative

The Traditional Industries Initiative is designed to address industry's needs in education, training, technology transfer and R&D. Georgia spent $60 million between 1991–1995 (including $32 million industry expenditures) to relocate the Institute of Paper Science and Technology from Wisconsin to Georgia and modernize the Herty Foundation. The institute is a pilot plant for the paper industry nationwide. The Food Processing Consortium received $25,000 for the planning in 1994. Finally, the Textile and Apparel Consortium received $1 million to equip the National Textile Center and Apparel Manufacturing Center.

Economic Development Institute

The Economic Development Institute (EDI) serves as a single access point for those seeking technical assistance or information from Georgia Tech, where EDI is housed. The EDI is an umbrella organization for economic development, technology transfer, and new enterprise development activities. EDI funding comes from 60% state, 28% federal, and 12% business and industry.

A major component of EDI is the Georgia Industrial Extension Service which offers technical analysis and feasibility studies, facility planning and layout, material and product handling, production and inventory control, environmental and safety assessment, strategic planning, energy conservation, labor supply analysis, wage rate survey, and in-plant human resources training. The Advanced Technology Devel-

opment Center (ATDC), created in 1980, aims to increase the high technology business base in Georgia. The ATDC, in turn, includes a number of sub-components. The Support Service offers technical and business management services to help entrepreneurs build and operate their enterprise. The Corporate Partnering Service helps identify potential corporate partnerships between small and large companies. The Corporate R&D Support Program provides access to R&D groups of existing corporations to Georgia Tech's resources. Finally, the Faculty Research Commercialization Program provides financial and business development support to faculty members at Georgia Research Alliance universities (discussed below) to form new companies or to license the technologies for existing companies.

According to the EDI web page (www.edi.gatech.edu) the EDI last year provided technical assistance to 1,150 companies and 130 communities and economic development organizations. While the method for determining results is not specified, the EDI says that Georgia companies added or retained 2,400 jobs as a result of its efforts and that ATDC companies employed 2,500 persons and had revenues exceeding $300 million.

Georgia Research Alliance

The most widely heralded and most expensive component of Georgia's TED programs is the Georgia Research Alliance. The Georgia Research Alliance (GRA) was founded in 1990, as a three-sector partnership of the state's research universities, the business community, and the state government. Its mission is to foster economic development within Georgia by developing and leveraging the research capabilities of research universities within the state and to assist and develop scientific and technology-based industry, commerce, and business. In FY 1998, GRA received $ 42.4 million from the State of Georgia, constituting a little more than 80% of the Georgia's TED investment. A major element of GRA is attracting world-class eminent scholars to Georgia, with the presumption that the scientists and engineers will build up the scientific and technical base of the state and permit the research universities to play a key role in working with industry. The GRA programs are centered around major research centers including the following:

- Georgia Center for Advanced Telecommunications Technology (GCATT): GCATT oversees university-based research that helps

shape and support the emergence of the advanced telecommunications industry to advance the economy.

- Georgia Biotechnology Center (GBC): GBC supports for scientific programs and assistance for business and economic development. Research activities includes genetics and molecular medicine; vaccine and diagnostics development; drug design and synthesis; microbial conversion and fermentation; protein engineering and production, and biological substitutes.

- Georgia Environmental Technology Consortium (GETC): GETC's mission is to target the research strengths among Georgia's environmental scientists and engineers on the needs of Georgia.

The GRA sponsored research totaled more than $700 million (all sources) in 1996. According to self assessments, the GRA is responsible for an increase in university-based licenses from 22 in 1990 to 50 in 1996 and has yielded six high-tech startup companies. GRA researchers have established partnerships with a number of leading companies including Eastman Kodak, IBM and Hitachi USA. Understandably, the state's universities are keen on GRA programs which have by any measure been a major boon to their ability to recruit leading faculty.

Thus, GRA is the wellspring of the state's TED programs and its importance is underscored in Table Three which gives expenditures by program group for the years 1993–1999. It is important to underscore that the TED expenditures represent less than one percent of the State's total appropriations for FY2000. Of the total budget of $13.2 billion, public education receives 56.3%, human services 22.8% and public safety 8.5%. As in most state governments TED programs receive much attention by not much funding (at least not on a proportional basis).

The Bust within the Boom

During the past decade, Georgia's economy has been booming. Its growth has been well beyond that of the median for all states, even during a period general economic growth. Its growth has exceeded other regions of the southern United States. In aggregate, Georgians and, especially, Atlantans are much better off than they were ten years ago. The economic boom in Georgia has permitted the funding of widely-admired Hope Scholarships, a program to provide state university financing for

Table 3
Budget: R&D-Based Economic Development Programs of the State of Georgia

	Traditional Industries Initiatives	Georgia Research Alliance (GRA)	Advanced Technology Development Center (ATDC)	Total ($ in 1000s)
1993	.	15,050	1,555	16,605
1994	2,200	22,000	1,581	25,781
1995	5,172	44,625	1,886	51,683
1996	5,915	29,744	1,979	37,638
1997	7,615	40,129	2,282	50,026
1998	6,160	38,925	2,388	47,473
1999	7,150	42,400	2,178	51,728

Source: Budget Report 2000, 1999, 1998, 1997, 1996 State of Georgia.

all students who maintain a "B" average. The university system has had a period of unparalleled growth. The real incomes of Georgia citizens, taken in aggregate, have advanced at such a remarkable rate that one of the chief economic complaints is the cost and supply of labor.

Examining the aggregate masks the bust within the boom. Table Four gives figures for income distribution in the United States between 1970 and 1996 (i.e., before the peak of the boom). If we examine changes according to quintile we find, remarkably, that there is *only one income quintile that has been increasing steadily since 1970*. Everyone else is either declining or holding their own. Persons with only high school educations (about half the labor force) have been steadily *losing* income, when adjusted for inflation, for more than a decade. If we examine the Gini index of inequality we see that it has been increasing each decade since 1970. (A Gini coefficient of 1 is complete inequality. An index of 0 means everybody makes the same thing).

The reasons for increasing income inequality and stagnant lower- and middle-income wages have begun to receive considerable attention (e.g. Danziger and Gottschalk, 1993; Karoly and Burtless, 1995; Weinberg, 1996). Factors cited include shift to a service economy, increase in single parent households, increased opportunities for highly skilled workers at the same time as decreased opportunities for unskilled and less skilled workers, global competition, the "knowledge economy" and importance of computer skills, and increasing use of part-time workers (Weinberg, 1996).

Table 4
Percent Distribution of Aggregate Income by Quintiles

	# of Households (In 1000s)	Lowest	Second	Middle	Fourth	Highest	Median Money Income (1996 $)	Gini Coefficient of Income Inequality
All Races								
1996	101,081	3.7	9.0	15.1	23.3	49.0	35,492	0.455
1995	99,683	3.7	9.1	15.2	23.3	48.7	35,082	0.450
1990	94,312	3.9	9.6	15.9	24.0	46.6	35,945	0.428
1980	82,368	4.2	10.2	16.8	24.8	44.1	33,763	0.403
1970	64,374	4.1	10.8	17.4	24.5	43.3	33,181	0.394
White								
1990	80,968	4.2	9.9	16.0	23.9	46.0	37,492	
1980	71,872	4.4	10.5	17.0	24.6	43.5	35,620	
1970	57,575	4.2	11.1	17.5	24.3	42.9	34,560	
Black								
1990	10,671	3.1	7.9	15.0	25.1	49.0	22,420	
1980	8,847	3.7	8.7	15.3	25.2	47.1	20,521	
1970	6,180	3.7	9.3	16.3	25.2	45.5	21,035	
Hispanic								
1990	6,220	4.0	9.5	15.9	24.3	46.3	26,806	
1980	3,906	4.3	10.1	16.4	24.8	44.5	26,025	

Sources: Statistical Abstract of the United States, 1998. Table No. 738—Money Income of Households. The Population of the United States, Table 15-12. Table 15-12—Share of Aggregate Household Income, by Income Quintile and Race-Ethnicity: 1970–1990. U.S. Bureau of the Census—Income 1997—Table B. Website: www.census.gov/hhes/income97. Accessed April 12, 1999.

While income inequality figures are not available for Georgia, other indicators suggest that the inequality gap may be larger in Georgia than many other states. Often the splits are along racial lines. In 1997, the median family income for whites in Metropolitan Atlanta was nearly $50,000, whereas it was $17,000 for African-Americans. The splits between metropolitan Atlanta and rural Georgia are just as sharp. Clearly, Georgia, as so much of the United States, is enjoying a boom *and* a continued bust.

It is interesting to note that income inequality data are unavailable for most states, not just Georgia. While there is a huge literature, both popular and academic, on income inequality, the issues usually are not attached to the states but, rather, are viewed as national issues (Leigh, 1995).

Two Agendas: Implications for TED Programs?

In best economic modeling tradition, let us begin with an assumption not altogether realistic, but useful for theory development. Assume a state policy leader who has a dual agenda, both traditional economic growth and economic-social, and who wishes to bring them together in the state's technology-based economic development programs. This may not be an altogether realistic assumption. History is not on the side of the melding of the two agendas. To this point, there is no clamor to expand the missions of the TED programs to address, or for that matter to even consider, the vast and deep economic divides so fundamental to our nation and its economic structure. Nevertheless, let us begin with our ideal type state leader, one who wishes to achieve economic growth and, at the same time, address joblessness, income inequality, and the needs of an under skilled labor force. Should TED programs take on a dual agenda?

Arguments Against a Dual Agenda TED Program

But perhaps the best argument against taking up a dual agenda for TED programs is that the amount of money involved is so small. When we compare TED program investments to educational expenditures (a much more obvious candidate for the dual economic agenda), we find that in every state the TED expenditures pale by comparison. In a budget dominated by education and social services expenditures, why not reserve some small amount for mainstream, unfettered aid to capitalism? Even if TED programs are, essentially, regressive middle class entitlements (a point many would reject), is it not permissible to have one quite small (proportionately) such program? Moreover, it seems possible that if the TED programs are to take on additional missions, the small amount of money may be diluted with a resulting diminution of aggregate benefit.

A related argument against TED taking on a dual agenda is that current programs stretch limited funds by leveraging and targeting, difficult to do if harnessed to an economic-social agenda. Most economic-social programs are relatively costly and focus more on distributed direct benefits than small amounts of matching and incentives money.

A third reason for keeping TED programs on their current track is that TED program officials, like everyone else, have their "core competency." Organizations, including states' technology-based economic

development programs, have distinctive organizational cultures and individuals choosing to work have much in common with respect to motives, aspirations and backgrounds. Generally, those TED programs have business backgrounds and are attracted by working with entrepreneurs. This does not mean that persons working in TED programs have little concern for poorly trained, low income labor, but they typically have little experience with them.

Finally, a state seeking a dual agenda TED program may have difficulty keeping existing political clientele happy while trying to add new objectives and new clientele. Most TED programs have spent years cultivating business leaders, entrepreneurs, and venture capitalists. The core clientele may be unsympathetic or hostile to an expanded mission.

These are formidable arguments, but there are also some good reasons to consider a dual agenda approach to TED programs. The chief argument being that the two economic agendas are not as incompatible as they may seem.

Arguments For a Dual Agenda TED Program

Perhaps the best evidence that TED programs can pursue a dual agenda is that some already are doing just that. In some states, New York comes to mind, support for industrial technology and support for labor training sometimes go hand-in-hand. Often, manufacturing extension programs bring together support services for management and for workers. Indeed, most states TED programs serve a dual agenda at least in some respects. In Georgia, for example, the Traditional Industries Initiative includes resources, albeit quite modest, devoted to training.

The single best argument for a dual agenda TED program is that such an approach would represent a *truly* win-win outcome. Certainly state policymakers would be delighted to spur economic development across the gamut of citizens, ushering in booms without hidden busts, creating wealth and at the same time increasing opportunity for the disadvantaged. States already devote massive expenditures to the dual agenda, they simply fail to bring them together. With one important exception: education.

In Georgia, less than 1% of state funds goes to TED programs, but 57% goes to higher education. Especially now that Georgia plans to reverse its policy of subtracting the amount of federal Pell grants (aimed at lower income students) from the amount of state funding for Hope scholarships, one could argue that higher education opportunity serves

a dual agenda. Related, about 80% of Georgia's TED program funding actually goes to higher education through the Georgia Research Alliance. Arguably, the states TED program is also a higher education program (though the premise is linkage to industry not labor force training). Education can be, often is, the vehicle for latching the economic development agenda to the economic social agenda. In many instances all that is required is a will to do so and to undertake joint programming with dual objectives.

Let us consider a dual agenda rationale that might appeal to TED program officials, even in those programs that have historically had no commitment to enhancing worker training or similar aspects of the economic-social agenda. Broadening the base of program beneficiaries inexorably broadens political support. In turn this could, conceivably, yield to increased investment in TED programs. This may be a particularly attractive outcome in the states where funding for TED programs peaked years ago, programs in which, according to Eisinger (1995), there is much more concern about survival than accomplishment. TED program managers often are frustrated: they continue to do good things and budgets grow very slowly, stay the same or, in real terms, sometimes decline. It is not, of course, clear that an expanded base would lead to expanded resources for TED programs, but it is a strategy that has worked in countless other programs. Transportation planners learned some time ago that the best way to build support for "smart highways" is to make sure everyone has one. In the early 1970s, the Model Cities program perfected the notion of expanding the base, first by making small towns and suburbs "model cities," and ultimately designating rural areas "model cities."

There is another vital reason to consider broadening the base, the objectives, and the evaluation criteria for TED programs: the inherent value of the economic-social agenda. All too often, the economic development agenda and the economic-social agenda are pitted against one another and one finds oneself falling into the trap of picking a side. But most business people understand instinctively that having a huge set of untrained, unskilled high school dropouts affects the state's work force and its overall economy. They understand that leaving unskilled labor behind in today's knowledge economy means that bills will come due tomorrow in the form of unemployment compensation, welfare payments and even costly new prisons. Similarly, all but the least judicious advocates of the economic-social agenda understand instinctively that

the receding tide of a slow growth state economy lowers all ships and all those on board, including those in the steerage.

In sum, the dual agenda holds obvious attractions for policymakers who design and fund states' technology-based economic development programs. But the attractions of a true "win-win" TED program (as opposed to today's more common "a-few-people-win-a-lot-and-we-hope-some-of-it-trickles-down" programs) must be balanced against the dangers of tampering with small programs that already seem to be working well. Perhaps the key is to find alternative linkage mechanisms. The universities are already well positioned to play this role and it may the case that only some joint programming and coordination of goals is required. The role of universities as sources of science and technology has received increased recognition and universities have always served as sources of workforce training and skill development. Strategies for bringing those multiple objectives together in an integrated TED program may be the best way to attain the dual agenda.

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