



RETURNS FROM INVESTMENTS IN WORKFORCE SERVICES:

TEXAS STATEWIDE ESTIMATES FOR PARTICIPANTS, TAXPAYERS AND SOCIETY

Prepared for the
TEXAS ASSOCIATION OF WORKFORCE BOARDS

by
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Tara Carter Smith
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With assistance from
Burt S. Barnow

August 2008



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Executive Summary

This report provides state-level estimates of the return on investment (ROI) for comprehensive workforce services delivered through local workforce boards in Texas. The Texas Association of Workforce Boards (TAWB), the statewide association of workforce board chairs and directors, initiated and supported the Ray Marshall Center in conducting this analysis, which improves upon earlier Center efforts in a number of important respects. This analysis:

- Estimates ROI based directly on *quasi-experimental impacts* on employment, earnings, welfare and Unemployment Insurance (UI) claims;
- Presents ROI estimates from the *perspectives of participants and society as well as of taxpayers*;
- Relies on *certified expenditure data* from the Texas Workforce Commission (TWC); and
- Provides both *conventional ROI measures as annualized internal rates of return (IRR)*, as well as overall investment returns for the period.

Participant Returns

Participants, including both individuals and employers, garner considerable net benefits from investments in workforce services over both the 5-year and 10-year time periods for which returns are projected. Costs are \$5,007 per participant, mostly reflecting earnings foregone by participants while receiving services. Employers also receive tax credits (\$220 per participant) for hiring eligible participants. Total returns for participants over the 5-year period, expressed in present value terms, equal \$8,169, for a net return of \$3,162 and a 163 percent total return. Using the more standard internal rate of return (IRR) formulation yields an *annualized ROI for the 5-year period of 29 percent for participants*. Over the 10-year period, costs remain unchanged, while returns totaled \$13,697 in present value terms, yielding net returns of \$8,690 and a 274 percent total return. This translates into an *annualized ROI for the 10-year period of 38 percent for participants*. These results suggest that every dollar invested in workforce services returns \$1.63 over five years and fully \$2.74 over ten years.

Taxpayer Returns

From the taxpayer or rest-of-society perspective, costs are considerably less, including direct government expenditures on workforce services (\$1,300 per participant) as well as the value of employer tax credits (\$220) for a total of \$1,520; foregone participant earnings are excluded. The stream of returns from workforce investments over the 5-year period, expressed in present value terms, is \$1,775, while the net present value of returns is just \$254 over 5 years, for a 117 percent total return. This translates into an *annualized 5-year ROI of 12 percent for taxpayers*. Over the 10-year period, returns in present value terms total \$3,155. Net returns over 10 years are \$1,634, for a 208 percent total return. The *annualized ROI for the 10-year period is 25 percent for taxpayers*. Thus, each dollar invested in workforce services returns \$1.17 and \$2.08 over the 5-year and 10-year periods, respectively.

Societal Returns

For society as a whole, taxes and transfers — including welfare, Food Stamps and UI benefits — are “netted out,” because they are costs to one group (taxpayers), but benefits to another (participants). The 5-year total return to society for workforce investments in Texas is estimated to be \$9,944 in present value terms, for a net return of \$3,416 and a total return over the period of 152 percent. The *annualized ROI for the 5-year period is 25 percent for society*, based on total workforce costs of \$6,527 per participant. Ten-year net returns are estimated to be \$10,324 and a total return of 258 percent. The *annualized ROI for society the 10-year period is 35 percent*. Over five and ten years, workforce investments statewide are associated with net returns to society of \$1.52 and \$2.58 for every dollar invested.

Thus, it is clear that regardless of perspective or time period considered, the net returns from workforce investments are both positive and substantial.

Low- Versus High-Intensity Investment Returns

The intensity of workforce investments varies considerably, from the shortest-term job referrals from the Employment Service (ES) to longer-term skills training offered through local community colleges, some of which may lead to occupational certificates and/or associates degrees. The share of high-intensity services also varies widely from area to area

depending on the policy emphasis boards place on such services. Statewide, an average of only about 2% of participant-weeks for the two-year period studied was spent in high-intensity services.

Participating in high-intensity services was associated with annual earnings impacts of \$1,848 over and above the impacts estimated for low-intensity services (i.e., \$564 for just the first two quarters of year one). The earnings impacts from high-intensity services are projected to endure throughout the 10-year period.

Implications for Policies and Programs

These ROI estimates suggest important implications for workforce development policies and programs. First, policymakers who have been reluctant to increase appropriations for workforce services in recent years would be well advised to consider these ROI estimates and invest far more of their limited funds in such efforts. While policymakers have focused considerable time, energy and resources on public education, the returns to investments in workforce services are at least as high as those for education and accrue to individuals who are already of working age as well as employers.

Second, workforce investments tend to be dominated by low-intensity services. It is important for workforce boards to provide for a continuum of services locally in order to help jobseekers and employers trying to connect with each other more effectively in the labor market, as well as services that build skills and foster increased economic competitiveness. Public investments in high-intensity services yield more lasting returns and should receive greater emphasis in the policy mix.

Third, still more work is needed to capture the returns associated with investments in younger youth, as well as those stemming from savings on correctional expenses over time.

Introduction

This report describes the approach used to estimate returns on investment (ROI) for workforce services provided through local workforce boards in Texas. It also presents ROI estimates for Texas as a whole. The Texas Association of Workforce Boards (TAWB), the statewide association of workforce board chairs and directors, initiated this ROI analysis, which improves upon the earlier effort by King et al. (2003) in a number of important respects, several of which were discussed in King and O'Shea (2003). In particular, the present analysis:

- Estimates ROI based directly on *quasi-experimental impacts* of participation in workforce development services on employment, earnings, welfare and Unemployment Insurance (UI) claims;
- Presents ROI estimates from the *perspectives of participants and society as well as of taxpayers*;
- Relies on *certified expenditure data* from the Texas Workforce Commission (TWC); and
- Provides both overall investment return measures, as well as *more conventional ROI measures as annualized internal rates of return (IRR)*.

The report begins by briefly describing the Texas workforce development system, after which it presents the approach to ROI estimation as well as key assumptions that underlie the resulting estimates. It then presents the ROI estimates for Texas from three perspectives: participants, taxpayers, and society as a whole. It concludes with a discussion of the implications of these results, focusing especially on the differential returns associated with investing in high- versus low-intensity workforce services.

The Texas Workforce Development System

Texas is the second largest state in the United States, with a 2005 workforce of over 11 million.¹ To serve the state's diverse and rapidly growing workforce, TWC and the 28 local workforce development boards, together with employers and a large network of provider institutions including community colleges, nonprofit organizations, for-profit providers and others, form a workforce development system to provide a wide array of services to Texas employers, individuals and communities.

A total of 684,655 workers found employment after obtaining services at Texas' Workforce Career Centers in 2005. Many more accessed workforce services using Web-based tools. In addition, over 12,000 new and incumbent workers received customized training through efforts supported by the Texas Skills Development Fund; those who completed programs supported by the fund earned just over \$17 per hour. An average of 116,881 children received subsidized child care every day so that their parents could participate in workforce programs or work. In fiscal year 2005, Texas spent about \$1.1 billion on services to employers and workers and the communities in which they are located. In addition, more than 138 million dollars in employment-related tax credits, including both the Work Opportunity Tax Credit (WOTC) and Welfare-to-Work (WtW) Tax Credit, were issued to Texas employers for hiring qualified workers in 2005. Expenditures on workforce services by major federal and state funding streams for state fiscal years 2003-2004 and 2004-2005 are provided in Appendix A.

TWC makes policy and administers workforce development programs through 28 local workforce development boards across the state (see Figure 1). Specifically, boards oversee and administer the following major programs within their local areas: Workforce Investment Act (WIA) Title I Adults, Dislocated Workers, Youth and the WIA Alternatives program²; Temporary Assistance for Needy Families (TANF) Choices programs for recipients of cash welfare; Food Stamp Employment and Training (FSE&T) programs; Project RIO, a statewide program for ex-offenders; Trade Adjustment Assistance/Training (TAA) programs for workers adversely affected due to international trade; the Employment

¹ This description is drawn from the *2005 Texas Workforce Commission Annual Report*, which can be found at www.twc.state.tx.us/news/ar05.pdf.

² WIA Alternatives is a statewide discretionary program, which supports an array of workforce services that vary from area to area.

Service (ES), supporting labor exchange services for workers and employers; and Veterans Employment and Training Services (VETS) programs.

A handful of local boards — including those in Austin, Central Texas, Gulf Coast and others — provide a range of workforce services to participants and employers with funds in addition to the funding streams listed above. In some instances, cities and/or counties support services from local tax revenues, while in others, local chambers of commerce or philanthropic institutions support them. Such efforts are not addressed directly in this analysis, but are noted and described where relevant and the requisite information is available. Appendix B briefly describes these initiatives.

Approach and Key Assumptions

Researchers at the Ray Marshall Center are providing research and technical expertise to TAWB, updating and refining methods for estimating returns on investments (ROI) from workforce services provided through the programs and funding streams listed above and producing ROI estimates for Texas as a whole and for most of the 28 local workforce areas.³ This report provides statewide estimates of the *net* returns to participants, taxpayers and society. Workforce services have been categorized into those that are *high-intensity services* — those enhancing participants’ knowledge and skills — and those that are *low-intensity services* — primarily job referrals, job search assistance and similar labor force attachment (LFA) services. The former tend to raise participants’ skill levels, while the latter mainly reduce participants’ time between jobs and employers’ vacancy-days.

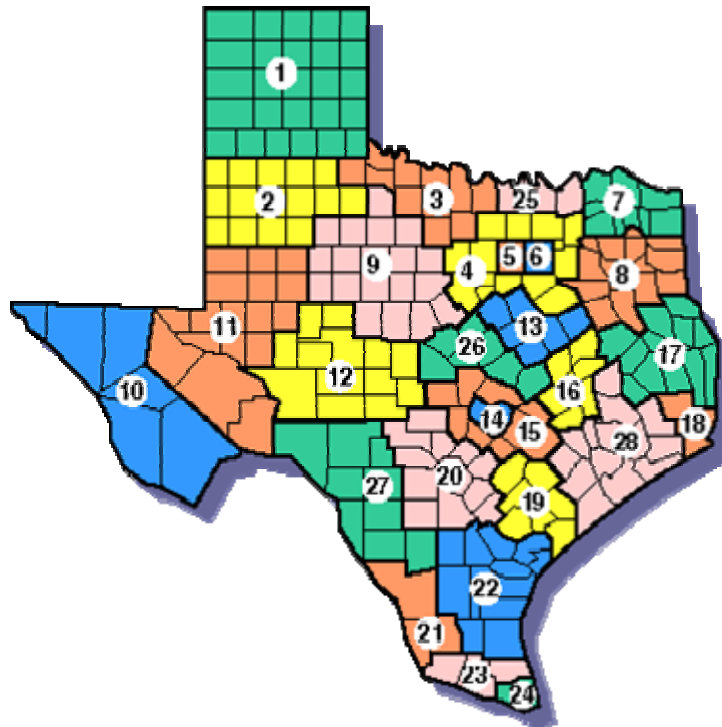
This section describes the estimation approach and presents key assumptions guiding the analysis, as follows:

- ❑ *Workforce program array.* The focus of this analysis is primarily on federal and state funding streams that are directly controlled or strongly influenced by local workforce boards, namely:
 - WIA Title I programs, serving adults, dislocated workers, and older youth (aged 19-21 years), as well as WIA Alternatives. Program services for younger youth, those aged 14-18 years, have been excluded given the difficulty of constructing valid comparison groups for them. Services under these WIA programs are a mix of low- and high-intensity services.
 - TANF Choices programs, which also offer a mix of low- and high-intensity services to recipients of cash welfare.
 - Food Stamp E&T programs, which offer almost exclusively low-intensity labor force attachment services to Food Stamp recipients.
 - Project RIO, a state program offering low-intensity labor force attachment services to ex-offenders.
 - Trade Adjustment Assistance/Training programs, which offer a mix of both low- and high-intensity services to workers adversely affected because of trade.
 - ES, offering low-intensity labor exchange services, e.g., job referrals.

³ The Concho Valley, North East and Panhandle workforce boards declined or were unable to participate fully in the project for the time period in question.

- VETS programs providing low-intensity job referrals and related services to veterans.

Figure 1. Texas' Local Workforce Development Areas



- | | |
|--------------------------------------|---|
| 1. Panhandle | 15. Rural Capital |
| 2. South Plains | 16. Brazos Valley |
| 3. North Texas | 17. Deep East Texas |
| 4. North Central | 18. South East Texas |
| 5. Tarrant County | 19. Golden Crescent |
| 6. Dallas | 20. Alamo |
| 7. North East | 21. South Texas |
| 8. East Texas | 22. Coastal Bend |
| 9. West Central | 23. Lower Rio Grande Valley |
| 10. Upper Rio Grande | 24. Cameron County |
| 11. Permian Basin | 25. Texoma |
| 12. Concho Valley | 26. Central Texas |
| 13. Heart of Texas | 27. Middle Rio Grande |
| 14. Capital Area | 28. Gulf Coast |

- *Cohorts and time periods.* Our focus is on individuals and employers served by the funding streams listed above during two time periods: October 2003 to September 2004, and October 2004 to September 2005. Returns are projected for both 5- and 10-year post-investment periods.

❑ *Service strategy and target group estimation.* We have classified services across federal and state funding streams into two broad types, with impacts and returns estimated accordingly:

- Low-intensity services, e.g., job search and related LFA services
- High-intensity services, e.g., training and skills development services

The coding structure for sorting low- versus high-intensity services, which is based on service codes and related descriptions in The Workforce Information System of Texas (TWIST), is presented in Appendix C.

❑ *Workforce investment expenditures.* We have based workforce services costs upon certified expenditure reports provided by TWC fiscal staff. Expenditures on younger youth, those aged 14-18 years, are excluded from the ROI computations.

❑ *Opportunity cost.* We have factored in the imputed value of participants' time as a measure of their foregone earnings while receiving program services. Following Hollenbeck and Huang (2006), we have used comparison group earnings for the treatment group's in-program period as the measure of opportunity cost.

❑ *Workforce investment outcomes.* We have accessed TWIST, UI wage, UI claims, TANF and Food Stamp benefit data to measure the key outcomes of interest, including earnings and receipt of welfare, Food Stamps and UI benefits.

❑ *Impact estimation.* We have estimated low-intensity participant impacts, based on deviations from their past employment and earnings trajectories,⁴ assuming any such impacts decay to zero by the end of the second quarter following service. Low-intensity services are a mix of job referrals — expected to have zero impacts for participants but some impacts for employers — and job search assistance and related services, which have been shown to have more substantive effects through teaching job-seeking skills that reduce time-to-first job and increase the time employed, if not wage levels (see the NEWWS Evaluation summaries by Hamilton 2002). We have estimated *incremental impacts* for participants from high-intensity services using a

quasi-experimental design, comparing key outcomes for participants and comparison groups of similar non-participants who received only low-intensity services such as core services through WIA or job referrals through ES (details of which are provided in Appendix D).⁵

In addition, we have imputed an additional 10% of earnings impacts to capture the value of associated employee fringe benefits, following Hollenbeck and Huang (2006) who estimate the value of employee benefits at 20% based on recent Bureau of Labor Statistics (BLS) and US Chamber of Commerce survey data. We have adjusted this figure downward by half (to 10%) to reflect the fact that many workers no longer have access to full employer-provided fringe benefits, relying on recent coverage estimates for health and retirement, annual and sick leave, and other benefits (see BLS 2008, EBRI 2005). We present the results of applying a higher fringe benefit coverage figure in the sensitivity analysis in Appendix E.

We have also imputed the value of federal, state and local taxes paid on estimated earnings impacts, based on estimates of taxes paid in Texas by household income level from the Center for Public Policy Priorities (Lavine 2007) and Piketty and Saez (2007).

We imputed employer impacts for increased productivity and the value of reduced vacancy-days. While Barron et al. (1997) have estimated that employers capture 90% of the benefits of OJT in the form of increased productivity when they provide employer-designed training, other studies suggest that the value of training and related services that workers themselves choose is of less value to employers (e.g., Bishop 1991). Given the range of workforce services and their associated impacts, we have constrained our imputed values for employer impacts, setting the upper-bound estimate of employer benefits from high-intensity services at 10 percent of the value of participant earnings impacts and the lower-bound estimate at zero.

⁴ As explained in Appendix D, constructing comparison groups for participants in low-intensity services is problematical since all such participants are already in the treatment group.

⁵ The resulting impact estimates may be biased upward to an unknown extent due to selection bias that could not be fully controlled for.

- ❑ *Decay rates.* Impacts resulting from participation in workforce services tend to decay or diminish over time as the effect of the particular intervention lessens. Recent evaluations comparing LFA and human capital development (HCD) approaches for welfare recipients suggest that earnings impacts of the former diminish over time, while those from HCD persist (Hamilton 2002). Earnings impacts for welfare women in intensive training programs were undiminished fully 7-9 years later (e.g., Couch 1992, Hotz et al. 2000, King 2004). We have applied impact decay rates that vary with service intensity.
- ❑ *Spending multipliers* can also be applied to earnings impacts, as the first-round effects of workforce investments, for the societal perspective under certain circumstances. Benefit/cost analysis guidelines suggest that multipliers greater than one can be justified only when resources are not fully employed in the relevant labor market (OMB 2002). We did not apply spending multipliers for the estimates presented in the report, but for our upper bound estimates provided in the sensitivity analysis, we applied a spending multiplier of 1.4 to estimated earnings impacts in those areas in which unemployment rates are expected to be above full-employment levels — i.e., 4.5 percent — for a substantial portion of the post-investment periods.⁶
- ❑ *Discount rate.* We have utilized a 6.14 percent (nominal) social discount rate to render benefits and costs in present value terms.⁷ Three percent is the midpoint between real social discount rates suggested by OMB (2002) and Moore et al. (2004). We have added 3.14 percent for inflation based on the latest cost-of-living adjustment factor issued by the Social Security Administration.
- ❑ *Sensitivity analysis.* We have computed variations in our ROI estimates over 5- and 10-year periods and examined the effects of varying other parameters as well, including the shares of high- v. low-intensity services, employer benefits as a multiple of participants' earnings impacts, fringe benefit coverage, spending multipliers, and others. These sensitivity analysis results are reported in Appendix E.

⁶ Based on TWC historical labor market data (TRACER), Texas board areas that have experienced high rates of unemployment also tend to have experienced them over long periods of time, e.g., areas along the Texas/Mexico border, portions of southeast Texas.

- *Below-the-Line Benefits and Costs.* As with all such studies, a number of important benefits and costs cannot be factored directly into our ROI estimates, either because the requisite quantitative data are lacking or relevant research findings to support them are unavailable. We refer to these as “below-the-line” benefits and costs. Including omitted benefits would lead to increased returns, while including additional costs would lower them. It is generally much easier to quantify the costs of than the benefits from workforce services.

Among the benefits not factored directly into the ROI estimates reported here are the following:

- The economic impacts of workforce spending. Spending for service provision would lead to multiplier effects as providers spend these dollars. Including such effects would be appropriate for an economic impact analysis.
- The returns associated with related educational investments. Substantial returns are associated with postsecondary education not financed by WIA or TANF (e.g., tuition and fees, Pell grants), as well as private training investments by employers themselves.
- The benefits of reduced criminal activity and the savings from reduced teen pregnancy. For example, the Job Corps evaluation showed that participation led to substantial long-term reductions in the costs associated with involvement in the criminal justice system, as well as increased program output (Burghardt et al. 2001).
- The net returns of local workforce initiatives beyond the federal and state programs listed above.
- Younger WIA youth who complete additional years of schooling due to participation also may enjoy enhanced lifetime earnings. The evaluation literature suggests that, with the noteworthy exception of Job Corps, positive, statistically significant earnings impacts for youth have seldom been detected (see King 2004).

⁷ We use a nominal rate, unadjusted for inflation, since earnings and other impacts also are computed in nominal terms.

Return-on-Investment Estimates

We start by asking the important question, what is a reasonable ROI from workforce development services? Or, better yet — given the difficulty of coming up with precise figures — what *range* would we expect our ROI estimates to fall within? The literature provides a variety of measures and associated estimates. First, the returns to a year of additional education — typically measured in terms of increased earnings — have been estimated by researchers at around 6-8 percent, meaning that each added year of education completed is worth on average a 6-8 percent increase in annual earnings.⁸ Nobel Laureate Gary Becker reported in the early 1960s that the money rate of return to a year of college education for White males was “between 11 and 13 percent, with higher rates on a high school education, and still higher rates on an elementary-school education (Becker, 1993, p. 7).

Second, many workforce development program evaluations stop short of estimating ROI or even net benefits. The Job Corps evaluation completed by Mathematica Policy Research in 2001 estimated that from the societal perspective, each dollar invested returned \$2.02 to society; this figure translates into a 202 percent return to society (Burghardt et al. 2001).

In addition, the earlier ROI analysis of workforce services in Texas conducted by the Ray Marshall Center produced what were referred to as “first-approximation” ROI estimates (King et al. 2003). Those estimates, while projected for the same 5- and 10-year periods, differed on a number of assumptions and parameters. The earlier estimates were based on an approach that reported overall net returns over costs instead of a more traditional annualized internal rate of return; used a lower (real) discount rate (3 percent); relied on assumed rather than directly estimated impacts on earnings; were based on local rather than TWC-certified expenditure data; and were computed solely from the taxpayer perspective, among other notable differences. With these important differences in mind, King et al. (2003) estimated that taxpayer returns for the “composite” Texas workforce board were \$6.00 and \$8.00 for the 5- and 10-year periods, respectively.⁹

⁸ King (2008, pp. 4-5) presents these and related estimates by Becker, Krueger, and others.

⁹ Our earlier taxpayer ROI estimates likely over-counted the returns for workforce services.

For the present analysis, the net returns from workforce services have been examined from three main perspectives of interest: participants, taxpayers, and society (see Boardman et al. 2005). Participants in workforce services include both individuals and employers. Both prospective employees and employers are served by and benefit from workforce services. The participant perspective, thus, reflects net benefits to both sets of “customers.” Taxpayers in benefit/cost analysis are those not benefiting directly from workforce services; they are essentially the ones paying for the workforce services through taxes. The taxpayer perspective is often referred to as the “rest of society.” Society is the sum of participants and taxpayers. Shifting to the societal perspective results in a number of key benefits being “netted out,” in that they are transfers between participants and taxpayers. For example, welfare benefits and tax payments are transfers between these two groups and are not reflected in the computations of net returns to society as a whole.

Participant Returns

Participants, including individuals and employers, appear to garner considerable net benefits from investments in workforce services over both the 5-year and 10-year time periods for which returns are projected. As shown in Table 1, costs are \$5,007 per participant, mostly reflecting earnings foregone by participants while receiving services. Employers also receive tax credits (i.e., WOTC or WtW) for hiring eligible participants. Total returns for participants over the 5-year period, expressed in present value terms, equal \$8,169, for a net return of \$3,162 and a 163 percent total return. Converting to the more standard internal rate of return (IRR), which benefit/cost analysis uses for annualized ROI calculations, yields an *annualized ROI for the 5-year period of 29 percent for participants*. The primary sources of returns are increased participant earnings and fringe benefits and the value of increased employer output and reduced vacancy-days. Note that participants experience modest reductions in welfare and Food Stamps and UI benefits. They also pay more in taxes, reflected as a reduction in their returns.

Over the 10-year period, while costs are incurred only in the initial period and remain unchanged, returns totaled \$13,697 in present value terms, yielding net returns of \$8,690 and a 274 percent total return (Table 2). This translates into an *annualized ROI for the 10-year period of 38 percent for participants*. Most of the returns derive from increased earnings and employer productivity.

These results suggest that every dollar invested in workforce services returns \$1.63 over five years and fully \$2.74 over ten years to participants. The 10-year returns are greater despite the fact that the benefits from low-intensity services last only a short time; high-intensity investments keep on paying off with investment costs confined to the program year. The main cost to participants is in the form of foregone earnings while receiving program services. Direct program costs are borne by taxpayers and thus are not reflected in the participant computations.

Table 1. Five-Year Net Returns on Investment from Workforce Services, State FYs 2003-2005, Texas - Participant Perspective

	Program						5-year
	Year	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Expenditures/Participant							
Administration							
Program Services							
Employer Tax Credits	-\$220						
Foregone Participant Earning	\$5,227						
<i>Total Expenditures</i>	\$5,007						
PV of Total Expenditures							\$5,007
Returns/Participant							
Earnings		\$2,412	\$1,848	\$1,848	\$1,848	\$1,848	
Fringe Benefits		\$241	\$185	\$185	\$185	\$185	
Employer Output/Vacancy-days		\$241	\$185	\$185	\$185	\$185	
Welfare and Food Stamps		-\$133	-\$63	-\$63	-\$63	-\$63	
UI Benefits		\$239	-\$47	-\$47	-\$47	-\$47	
Taxes		-\$460	-\$333	-\$333	-\$333	-\$333	
<i>Total Returns</i>		\$2,541	\$1,775	\$1,775	\$1,775	\$1,775	
PV of Total Returns		\$2,394	\$1,575	\$1,484	\$1,398	\$1,317	\$8,169
				Net PV of Returns			\$3,162
				5-Year Return			163%
				5-Year ROI			29%

Source: Authors' computations.

**Table 2. Ten-Year Net Returns on Investment from Workforce Services,
State FYs 2003-2005, Texas - Participant Perspective**

	Years 1-5	Year 6	Year 7	Year 8	Year 9	Year 10	10-year Total
Expenditures/Participant							
Administration							
Program Services							
Employer Tax Credits		-\$220					
Foregone Participant Earning	\$5,227						
<i>Total Expenditures</i>	\$5,007						
PV of Total Expenditures							\$5,007
Returns/Participant							
Earnings	\$9,804	\$1,848	\$1,848	\$1,848	\$1,848	\$1,848	
Fringe Benefits	\$980	\$185	\$185	\$185	\$185	\$185	
Employer Output/Vacancy-d	\$980	\$185	\$185	\$185	\$185	\$185	
Welfare and Food Stamps	-\$386	-\$63	-\$63	-\$63	-\$63	-\$63	
UI Benefits	\$52	-\$47	-\$47	-\$47	-\$47	-\$47	
Taxes	-\$1,792	-\$333	-\$333	-\$333	-\$333	-\$333	
<i>Total Returns</i>	\$9,639	\$1,775	\$1,775	\$1,775	\$1,775	\$1,775	
PV of Total Returns	\$8,169	\$1,241	\$1,169	\$1,102	\$1,038	\$978	\$13,697
				Net PV of Returns			\$8,690
				10-Year Returns			274%
				10-Year ROI			38%

Source: Authors' computations.

Taxpayer Returns

From the taxpayer or rest-of-society perspective, costs are considerably less, including only direct government expenditures on workforce services (\$1,300 per participant) and the value of employer tax credits; foregone participant earnings are excluded from the cost computations from the taxpayer perspective. The stream of returns from workforce investments over the 5-year period, expressed in present value terms, is \$1,775. The major source of these returns is increased taxes computed on the earnings impacts. The net present value of returns from these workforce investments is \$254 over 5 years, for a 117 percent total return (Table 3). This translates into an *annualized 5-year ROI of 12 percent for taxpayers*.

**Table 3. Five-Year Net Returns on Investment from Workforce Services,
State FYs 2003-2005, Texas - Taxpayer Perspective**

	Program					5-year	
	Year	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Expenditures/Participant							
Administration	\$132						
Program Services	\$1,168						
Employer Tax Credits	\$220						
Foregone Participant Earnings							
<i>Total Expenditures</i>	\$1,520						
PV of Total Expenditures							\$1,520
Returns/Participant							
Earnings							
Fringe Benefits							
Employer Output/Vacancy-days							
Welfare and Food Stamps		\$133	\$63	\$63	\$63	\$63	
UI Benefits		-\$239	\$47	\$47	\$47	\$47	
Taxes		\$460	\$333	\$333	\$333	\$333	
<i>Total Returns</i>		\$353	\$443	\$443	\$443	\$443	
PV of Total Returns		\$333	\$393	\$370	\$349	\$329	\$1,775
				Net PV of Returns			\$254
							5-Year Return
							117%
							5-Year ROI
							12%

Source: Authors' computations.

Over the 10-year period shown in Table 4, returns in present value terms total \$3,155, with most of the benefits derived from increased taxes. Net returns over 10 years are \$1,634, for a 208 percent total return. The *annualized ROI for the 10-year period is 25 percent for taxpayers.*

Thus, each dollar invested in workforce services is associated with returns to taxpayers of \$1.17 and \$2.08 over the 5-year and 10-year periods, respectively.

Table 4. Ten-Year Net Returns on Investment from Workforce Services, State FYs 2003-2005, Texas - Taxpayer Perspective

	Years 1-5	Year 6	Year 7	Year 8	Year 9	Year 10	10-year Total
Expenditures/Participant							
Administration	\$132						
Program Services	\$1,168						
Employer Tax Credits	\$220						
Foregone Participant Earnings							
<i>Total Expenditures</i>	\$1,520						
PV of Total Expenditures							\$1,520
Returns/Participant							
Earnings							
Fringe Benefits							
Employer Output/Vacancy-days							
Welfare and Food Stamps	\$386	\$63	\$63	\$63	\$63	\$63	
UI Benefits	-\$52	\$47	\$47	\$47	\$47	\$47	
Taxes	\$1,792	\$333	\$333	\$333	\$333	\$333	
<i>Total Returns</i>	\$2,125	\$443	\$443	\$443	\$443	\$443	
PV of Total Returns	\$1,775	\$310	\$292	\$275	\$259	\$244	\$3,155
				Net PV of Returns			\$1,634
				10-Year Returns			208%
				10-Year ROI			25%

Source: Authors' computations.

Societal Returns

Looking at returns from the perspective of society as a whole, a number of factors in the computations change. The key to understanding these changes is that taxes and transfers — including welfare, Food Stamps and UI benefits — are “netted out” of the computations; while they are costs to one group (taxpayers), they are benefits to another (participants). Thus, the figures in Tables 5 and 6 reflect net returns to all members of society, *excluding* all taxes and transfers. The 5-year total return to society for workforce investments in Texas is estimated to be \$9,944 in present value terms, for a net return of \$3,416 and a total return over the period of 152 percent (Table 5). The *annualized ROI for the 5-year period is 25 percent for society*, based on total workforce costs of \$6,527 per participant. Ten-year net returns are estimated to be \$10,324 and a total return of 258 percent (Table 6). The *annualized ROI for society the 10-year period is 35 percent*. Over five and ten years,

workforce investments statewide are associated with net returns to society of \$1.52 and \$2.58 for every dollar invested.

Table 5. Five-Year Net Returns on Investment from Workforce Services, State FYs 2003-2005, Texas - Societal Perspective

	Program					5-year Total	
	Year	Year 1	Year 2	Year 3	Year 4		Year 5
Expenditures/Participant							
Administration	\$132						
Program Services	\$1,168						
Employer Tax Credits							
Foregone Participant Earning	\$5,227						
<i>Total Expenditures</i>	\$6,527						
PV of Total Expenditures						\$6,527	
Returns/Participant							
Earnings		\$2,412	\$1,848	\$1,848	\$1,848	\$1,848	
Fringe Benefits		\$241	\$185	\$185	\$185	\$185	
Employer Output/Vacancy-days		\$241	\$185	\$185	\$185	\$185	
Welfare and Food Stamps							
UI Benefits							
Taxes							
<i>Total Returns</i>		\$2,894	\$2,218	\$2,218	\$2,218	\$2,218	
PV of Total Returns		\$2,727	\$1,968	\$1,855	\$1,747	\$1,646	\$9,944
				Net PV of Returns		\$3,416	
				5-Year Return		152%	
				5-Year ROI		25%	

Source: Authors' computations.

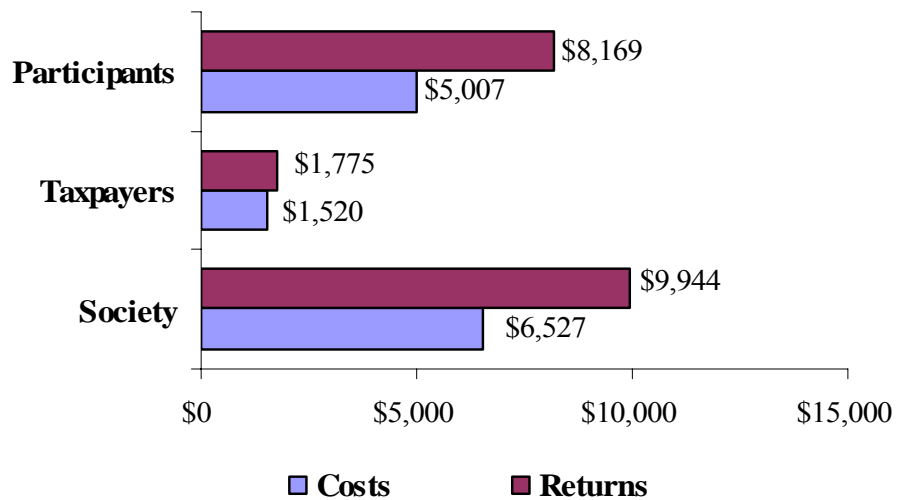
**Table 6. Ten-Year Net Returns on Investment from Workforce Services,
State FYs 2003-2005, Texas - Societal Perspective**

	Years 1-5	Year 6	Year 7	Year 8	Year 9	Year 10	10-year Total
Expenditures/Participant							
Administration		\$132					
Program Services		\$1,168					
Employer Tax Credits							
Foregone Participant Earning	\$5,227						
<i>Total Expenditures</i>	\$6,527						
PV of Total Expenditures							\$6,527
Returns/Participant							
Earnings	\$9,804	\$1,848	\$1,848	\$1,848	\$1,848	\$1,848	
Fringe Benefits	\$980	\$185	\$185	\$185	\$185	\$185	
Employer Output/Vacancy-d	\$980	185	185	185	185	185	
Welfare and Food Stamps							
UI Benefits							
Taxes							
<i>Total Returns</i>	\$11,765	\$2,218	\$2,218	\$2,218	\$2,218	\$2,218	
PV of Total Returns	\$9,944	\$1,551	\$1,461	\$1,377	\$1,297	\$1,222	\$16,852
				Net PV of Returns			\$10,324
				10-Year Returns			258%
				10-Year ROI			35%

Source: Authors' computations.

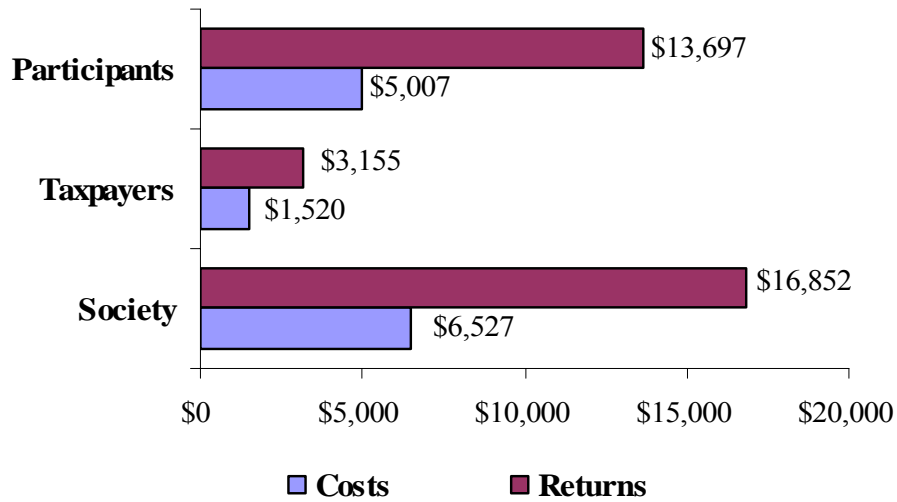
Summing up the ROI results, we have examined investments in workforce services from three perspectives — participants, taxpayers, and society — and found that *regardless of perspective or time period considered, the net returns from workforce investments are both positive and substantial*. Figures 2 and 3 below summarize this information in a simpler format. Figure 2 depicts the 5-year returns of workforce investments in the top bar, and the 5-year costs in the bottom bar for each of the three perspectives, all expressed in present value terms. Figure 3 provides the same information for the 10-year period.

Figure 2. Costs and 5-Year Returns from Workforce Services in Texas; Participant, Taxpayer & Societal Perspectives



Source: Authors' computations.

Figure 3. Costs and 10-Year Returns from Workforce Services in Texas; Participant, Taxpayer & Societal Perspectives



Source: Authors' computations.

Using the conventional internal rate-of-return formulation to produce annualized figures, the *5-year ROI estimates range from a low of 12 percent for taxpayers to a high of 29 percent for participants, while the 25 percent ROI for society falls in between. The 10-year estimates range from a low of 25 percent for taxpayers to a high of 38 percent for participants, with the societal ROI coming in at 35 percent.* Workforce investments yield strong returns, regardless of perspective or time period. Moreover, these returns compare quite favorably with the historical returns estimated for investments in education and workforce services as cited at the beginning of this discussion.

Low- Versus High-Intensity Investment Returns

As noted above, the intensity of workforce investments varies considerably, from the shortest-term job referrals from ES and one-stop career centers to multi-week job search seminars and even longer-term skills training offered through local community colleges, some of which may lead to occupational certificates and/or associates degrees. Moreover, the share of participant time spent in low- versus high-intensity services also tends to vary widely from area to area depending on the policy emphasis boards place on such services. Table 7 presents the shares of participant-days in high-intensity services for local boards and statewide. Statewide, an average of only about 2% of participant-weeks for the two-year

period studied was spent in high-intensity services as defined for this analysis, ranging from a low of just 0.6% to a high of 6.2%.¹⁰ It is important to note that these shares appear quite low in large part because ES registrants and participants in WIA core services far outnumber all others being served by local workforce boards. The share of WIA adult and dislocated worker exiters receiving training and other high-intensity services tends to be higher, closer to ten percent in Texas (Trutko and Barnow, 2007).

Table 7. High-Intensity Workforce Services Shares in Texas, State FYs 2003-2005, by Local Board Area & Statewide

LWDA	Percent of Participants' Time Primarily in High-Intensity Services		
	FY 2003-2004	FY 2004-2005	Average
1 Panhandle	1.0%	4.6%	2.0%
2 South Plains	0.5%	1.4%	0.8%
3 North Texas	2.0%	5.2%	2.9%
4 North Central Texas	1.9%	5.3%	2.7%
5 Tarrant County	0.9%	1.7%	1.1%
6 Dallas	1.3%	10.6%	3.3%
7 North East Texas	0.6%	2.8%	1.1%
8 East Texas	0.2%	3.0%	1.0%
9 West Central Texas	1.3%	4.9%	2.4%
10 Upper Rio Grande	2.2%	15.5%	6.2%
11 Permian Basin	1.2%	2.3%	1.5%
12 Concho Valley	1.2%	1.5%	1.3%
13 Heart Of Texas	0.7%	2.8%	1.2%
14 Capital Area	0.9%	3.5%	1.5%
15 Rural Capital	0.8%	1.9%	1.0%
16 Brazos Valley	0.8%	6.7%	2.4%
17 Deep East Texas	1.3%	3.5%	1.9%
18 Southeast Texas	0.3%	1.4%	0.6%
19 Golden Crescent	3.3%	5.3%	3.9%
20 Alamo	1.9%	3.6%	2.3%
21 South Texas	2.5%	4.0%	2.9%
22 Coastal Bend	1.6%	2.7%	1.9%
23 Lower Rio Grande	2.2%	3.5%	2.6%
24 Cameron County	4.2%	5.3%	4.5%
25 Texoma	3.4%	13.1%	5.3%
26 Central Texas	0.3%	2.9%	0.8%
27 Middle Rio Grande	1.0%	1.3%	1.1%
28 Gulf Coast	0.6%	2.4%	1.0%
Statewide	1.2%	4.4%	2.0%

Source: Authors' computations based on TWIST data from TWC.

¹⁰ Note that the high-intensity share varied even more within each of the two years, ranging from a low of 0.2% to a high of 15.5%.

Using a quasi-experimental approach, we estimated the *incremental value* of high-intensity versus low-intensity services with low-intensity participants (i.e., ES registrants, WIA core services participants) serving as the pool from which we drew comparison group members who were as similar as possible to treatment group members along key dimensions. Exact matches were performed by gender, quarter of participation, local board area, and the presence and size of a substantial pre-program earnings dip. Weighted multivariate matching was conducted based on age, education, race/ethnicity, welfare (TANF/Food Stamps), UI claims, and recent workforce development program history, as well as an extensive series of prior employment and earnings variables for the two or more years preceding enrollment in program services. (Appendix D contains a more detailed description of the estimation approach.)

On a statewide basis, participating in high-intensity skills development services was associated with annual earnings impacts of \$1,848 over and above the impacts estimated for low-intensity services (i.e., \$564 for just the first year). The earnings impacts from high-intensity services are projected to endure throughout the 10-year period, in line with the evaluation literature on training and related services.

Sensitivity Analysis Results

In addition to producing the ROI estimates reported earlier in this section, we also conducted analysis to determine how sensitive the annualized ROI results were to varying key parameters, including employer productivity impacts, employer fringe benefit coverage, spending multipliers and the rate of decay for high-intensity services. The detailed results for each perspective for both the 5- and 10-year projection periods are provided in Appendix E.

Assuming workforce services have no measurable impacts on employer output or vacancy-days results in lower ROI estimates for the participant and societal perspectives for both time periods though the estimates remain in the 23-34 percent range for participants and in the 21-31 percent range for society.

Increasing the assumed employer fringe benefit coverage rate from 50 percent to 75 percent leads to very minor increases in the annualized ROI estimates ranging from just 2 percentage points for society and 3 points for participants. The length of the projection period did not seem to matter.

Assuming that earnings and related impacts for participation in high-intensity workforce services decay to zero by the start of the 8th year post-program leads to a modest drop in the 10-year annualized ROI estimates in large part because out-year benefits are much more heavily discounted. The 10-year participant ROI falls by 3 points, while that for society falls by 4 points.

Adding in spending multiplier effects for society is associated with the greatest effects. If a spending multiplier of 1.4 times the earnings impacts is applied in the 18 areas in which the unemployment rate is expected to be consistently above full-employment levels (i.e., 4.5 percent) in projections period, the annualized ROI estimates increase dramatically: to 61 and 66 percent for society for the 5- and 10-year periods, respectively. Given that there is some controversy about the use of such multipliers in benefit/cost analysis, in the body of the report we have emphasized estimates that exclude their effects.

Implications for Policies and Programs

These ROI estimates suggest a number of important implications for workforce development policies and programs. First, investments in workforce services, both low- and high-intensity, for adults and older youth are associated with benefits for individuals and employers, and these translate into substantial returns. Policymakers who have been reluctant to increase appropriations for workforce services in recent years would be well advised to consider the ROI estimates presented here and invest far more of their limited funds in such efforts. Such investments pay real dividends in the near and longer term, in contrast to many other types of public expenditures.

Moreover, while policymakers have focused considerable time, energy and resources on public education, the returns to investments in workforce services clearly are at least as high as those for education and accrue to individuals who are already of working age as well as employers. Working-age adults are often bypassed or ignored when it comes to investing society's resources, despite the fact that there are far more of them than school-aged children and the effects on earnings and output are more immediate. In a nation expected to encounter gaps in workers, skills, and wages over the next few decades,¹¹ this is clearly an issue that should be addressed.

Second, workforce investments tend to be dominated by low-intensity services such as job referrals, job search assistance, and the provision of basic labor market information, while high-intensity services such as skills training tend to represent a very small share of the services provided. Yet, not surprisingly, the impacts from low-intensity services tend to be short-lived because they do not improve an individual's earnings capacity in any substantive way. It is important for workforce boards to provide for a continuum of services locally in order to help jobseekers and employers connect with each other more effectively in the labor market, as well as build skills and foster increased economic competitiveness. Technological advances, including Web-based job-matching tools, are likely facilitating the delivery of low-intensity services much more so than high-intensity ones. Public investments in high-intensity services yield more lasting returns and should receive greater emphasis in the policy mix.

¹¹ For example, see the Aspen Institute's 2003 report and the 2006 report of the *New Commission on the Skills of the American Workforce, Tough Choices or Tough Times*.

Third, still more work is needed to capture the returns associated with investments in younger youth, as well as those stemming from savings on correctional expenses over time. As noted, with the exception of Job Corps, evaluations of mainstream youth workforce programs have yet to produce reliable impacts on earnings and related outcomes. Moreover, it is inherently very difficult to create reliable comparison groups for such youth, both because they have so little pre-program labor market experience to match on and because, relative to older youth and adults, their behavior has yet to “settle down.”

Researchers at the Ray Marshall Center are exploring ways to link workforce services, labor market and related data to datasets for state jails, as well as federal prisons and local jails in order to directly estimate the impacts of workforce services on this important cost over time. Given that such expenditures often consume more than half of local government budgets and that corrections cost savings have been shown to contribute a large portion of the benefits from workforce services for youth and other populations, this is an important area for future exploration.

Finally, there are growing demands from all sectors of society for reliable “metrics” for gauging the effects of public investments, especially including ROI measures. Yet, the data to support such measures are often incomplete and/or hard to access, and the approaches necessary for estimating them difficult to implement well. This report has improved upon earlier work in terms of data quality and access, as well as estimation. Much more remains to be done.

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Appendix A. Texas Workforce Services Expenditures and Tax Credits

Texas Workforce Services Expenditures for Adults and Older Youth, State FYs 2003-2004 and 2004-2005

Adults and Older Youth Program/Funding Stream	Administration	FY 2003-2004 Program Services	Total
WIA Adult	\$6,215,226	\$62,254,616	\$68,469,843
WIA Dislocated	5,841,314	60,991,913	66,833,227
WIA Youth (out-school)	2,690,655	25,786,794	28,477,450
WIA, Alternative Statewide	358,891	9,820,693	10,179,584
TANF	6,566,924	68,380,168	74,947,092
FSE&T	1,332,766	13,612,988	14,945,753
Wagner-Peyser ES	1,011,750	29,035,597	30,047,347
Veterans E&T	110,059	7,991,317	8,101,376
Project RIO	273,178	3,317,676	3,590,853
TAA/NAFTA*			
Child Care	13,043,640	412,579,848	425,623,488
Total, Board-level	\$36,093,484	\$679,488,835	\$715,582,319
State-level Expenditures	\$46,396,611	\$9,465,554	\$55,862,165
Grand Total, Board- and State-level	\$82,490,095	\$688,954,389	\$771,444,484
Expenditures per-participant	\$66	\$549	\$615

* Boards did not administer TAA during FY 2003-2004.

Adults and Older Youth Program/Funding Stream	Administration	FY 2004-2005 Program Services	Total
WIA Adult	\$7,766,829	\$70,001,582	\$77,768,410
WIA Dislocated	6,544,377	66,979,548	73,523,925
WIA Youth (out-school)	2,714,837	33,845,567	36,560,404
WIA, Alternative Statewide	595,742	10,669,741	11,265,483
TANF	6,289,386	73,521,333	79,810,719
FSE&T	1,479,243	15,568,342	17,047,585
Wagner-Peyser ES	617,578	30,773,929	31,391,507
Veterans E&T	137,572	8,693,624	8,831,195
Project RIO	360,853	3,310,840	3,671,693
TAA/NAFTA	414,375	6,714,386	7,128,761
Child Care	13,205,604	411,670,132	424,875,736
Total, Board-level	\$40,126,396	\$731,749,024	\$771,875,420
State-level Expenditures	\$42,516,514	\$13,995,832	\$56,512,346
Grand Total Board- and State-level	\$82,642,910	\$745,744,856	\$828,387,766
Expenditures per-participant	\$198	\$1,787	\$1,986

Source: Texas Workforce Commission.

**Employer Tax Credits in Texas
State FYs 2003-2004 and 2004-2005**

Program, Statewide	Administration	Credits	Total
Employer Tax Credits, SFY 2004	\$1,565,598	\$129,602,100	\$131,167,699
Employer Tax Credits, SFY 2005	\$1,827,934	\$137,746,900	\$139,574,834
Per-participant tax credit expenditures, 2004-2005 average			\$220

Source: Texas Workforce Commission.

Appendix B.

Local Board and Related Workforce Initiatives

At least nine (9) boards operated “local” workforce development initiatives in the period relevant for our analysis, i.e., October 2003 to September 2005. However, TWIST does not contain detailed information for all of these participants, nor does TWC capture their expenditures on a consistent basis. Thus, while we note these initiatives, we have not factored in direct impact or ROI estimates for them.

Alamo ran a USDOL *Youth Opportunity Grant* in 2003-2005, with 4,390 youth enrolled. The grant provided 15 different pre-placement and placement activities: internship/subsidized employment, community service, sports/recreation, support groups, peer to peer mentoring, alumni groups, life skills training, individual tutoring, secondary school extracurricular activities, job readiness training, reading/math remediation, GED preparation, college/SAT preparation, occupational skills training, and short-term unsubsidized employment. The placement rate was 99.66 percent, defined as enrollees with a verified placement in employment, long-term education or long-term occupational skills training (OST). Alamo and Gulf Coast were the only grantees.

Capital Area was involved with several City of Austin and Travis County-funded workforce initiatives that the Center has evaluated using a quasi-experimental approach (Smith et al. 2007). During the study period, the City and the County provided a total of more than \$6 million in funding to area social service agencies. The services included education and literacy as well as training in occupational skills development, job search skills and job placement and/or retention services. A total of 1,544 people received services during the study period. The impacts associated with the more intensive service strategies (e.g., occupational training) were quite large relative to traditional LFA services (Smith et al. 2007).

Central Texas operated the *USDOL Jobs 4 Military Families Project* in 2003-2005. The purpose of the program was to assist military family members who left employment to accompany a military service member to Fort Hood. Collaborating with several community partners, the project attempts to match local businesses with these individuals. Since November 2003, grants for this project have come from the U.S. Department of Labor (\$6.85 million) and TWC (\$2 million). In addition, employers make in-kind contributions during the training period. Through February 2008, 3,212 people received services, with 1,802 entering employment.

Dallas County operated the *Empowering Employer Advancement Initiative* during 2003-2005 and beyond. With a DOL-approved waiver, the board contracts with local employers to provide current worker training. The goal is to assist Dallas County employers become more productive and competitive and to ensure employee growth through career advancement, salary increases, job retention and skills enhancement. The initiative has also increased employer participation within the workforce system, leveraging private dollars to expand current worker training and strengthening the

identity of the workforce system among local businesses. Between April 2003 and April 2006, a total of 3,497 individuals were trained under the program, at \$2,618,109 in expenditures and almost \$2 million in in-kind match from employers.

Gulf Coast operated a number of large initiatives in 2003-2005 funded by non-TWC sources. Totalling over \$20 million from federal and state agencies and private sources, these programs provided services in domestic health care training, aerospace job training, nurse retention, Employment Retention and Advancement (ERA) pilot, home health attendant and nurse training.

Lower Rio Grande operated a USDOL grant in 2003-2005 in conjunction with a community college. The board acted as the fiscal agent, with expenditures at \$154,704 during the study period. The community college spent the majority of the grant money to conduct training for participants.

Upper Rio Grande contracted with the Empowerment Zone program in the community to provide additional child care services beyond the federal Child Care Development Fund (CCDF) funding stream. Through this initiative, the board was able to provide child care services to an additional 1,200 children in FY 2003 alone. The total amount was over \$3 million during FY 2003 and FY 2004.

Tarrant County operated several initiatives in 2003-2005 totaling \$193,805. Services included providing financial assistance to low-income vehicle owners to comply with emission standards; recruitment, outreach, assessment and case management for participants of the community college self-sufficiency program; identification and referral of unemployed non-custodial parents; and testing strategies to increase employment and child support payments among non-custodial parents.

West Central used WIA Statewide Alternative funds to provide customized training for new and incumbent workers through a program called the Workforce Investment Fund. About \$257,000 was spent on this initiative, and 477 workers were trained. At least 25 percent of the expenditure included cash or in-kind match from employers.

In addition, the Ray Marshall Center (Schroeder et al. 2007) has evaluated the *Non-Custodial Parent Demonstration* and its impacts in the following local board areas: Gulf Coast, Tarrant County, and Upper Rio Grande.

Appendix C. Low- and High-Intensity Services Coding

Most workforce development funding streams support what can be characterized as *low-intensity services* (e.g., job referrals, job search assistance), including: Food Stamp E&T, Project RIO, ES, and Veterans E&T. However, WIA programs, TANF Choices and TAA/Training offer a mix of high- and low-intensity services to participants. These are coded using the TWIST service codes indicated below.

High-intensity services include TWIST Service Codes 1, 2, 3, 5, 7, 42, 43, 44, 53, 54, 55, 58, 76, 77, 78, 87, 89 and 179, as well as (for state-funded grants) SCSEP and LOTS.

Low-intensity services include all TWIST Service Codes not already classified as High-intensity.

Some participants may have received a combination of high- *and* low-intensity services while in WIA, TANF Choices or TAA. Participants have been classified as either high- or low-intensity based on their share of participant-weeks in each service type: participants with *50 percent or more* of their participant-weeks in high-intensity services have been classified as high-intensity; all others have been classified as low-intensity. This coding structure has been developed based on TWIST codes and data provided by Adam Leonard with TWC and discussions with local board and provider staff. NOTE: participants with Function Codes 864 and 866 have been excluded from all direct impact and ROI estimation computations; these codes pertain to services for younger, in-school youth.

High-intensity services include the following:

Service Category	TWIST Service Code	Service Name	Programs
Training services—occupational skills	78	Customized training	WIA Adult, Dislocated Workers
Training services—occupational skills	58	Entrepreneurial training	All programs except FSE&T
Training services—occupational skills	55	Job skills/training	All adult programs
Training services—occupational skills	1	Occupational/vocational training	All programs except One-Stop & Rapid Response
Training services—occupational skills	3	On-the-job training	WIA, CHOICES, TAA
Training services—occupational skills	76	Private sector training programs	WIA Adult, Dislocated Workers
Training services—occupational skills	77	Skills upgrade/ retraining	WIA Adult, Dislocated Workers
Training services—occupational skills	179	Training – Non-TWC	All
Employment services	42	Subsidized Employment	Choices
Employment services	43	Subsidized Employment – Other Funds	WIA Adults & DWs, TAA
Training services—occupational skills	7	Entry employment experience/internships	WIA youth (excluding younger, in-school youth)
Training service—occupational skills	5	Work experience	WIA, TAA, Choices, FSE&T
Training services	2	Basic ed skills/ABE	WIA, Choices, TAA
Training services	89	Education - other	Choices
Training services	44	ESL	
Training services	54	GED	
Training services	53	High School	Choices
Training services—other	87	Work-based literacy	Choices
State-run services	SCSEP	SCSEP Subsidized employment	[State-funded services local boards may operate]
State-run services	LOTS	Skills/Self (sufficiency) grant	[State-funded services local boards may operate]

Low-intensity services include all TWIST Service Codes not listed as high-intensity above.

Appendix D. Impact Estimation

Estimating the impact of low-intensity services on earnings and related outcomes is problematical in that all of the potentially available comparison groups are already encompassed by local board data from TWIST, including ES registrants and WIA core services participants. We have estimated low-intensity participant impacts, based on deviations from their past employment and earnings trajectories, assuming any such impacts decay to zero by the second quarter following service as indicated from the evaluation literature. Low-intensity services are a mix of job referrals — expected to have zero impacts for participants but some impacts for employers — and job search assistance and related services, which have been shown to have more substantive effects through teaching job-seeking skills that reduce time-to-first job and increase the time employed, if not wage levels (see the NEWWS Evaluation summaries by Hamilton 2002).

We estimated the *incremental value* of high-intensity versus low-intensity services using a quasi-experimental design with low-intensity participants, including ES registrants and WIA core services participants, serving as the pool from which we drew comparison group members who were as similar as possible to the treatment group of individuals along key dimensions. In selecting the comparison group, *exact matches* were first performed for the following variables: gender, quarter of participation, county, and the presence and size of any pre-program earnings dip. *Weighted multivariate matching* then was conducted based on age, education, race/ethnicity, welfare (TANF/Food Stamps), UI claims, and recent workforce development program history, as well as a series of prior employment and earnings variables for the two or more years preceding enrollment in program services. The matching procedure utilized a weighted multivariate approach to calculating distance, a method that places the greatest weight on those dimensions for which the treatment group and pool of potential comparison group members differ the most. “Nearest-neighbors,” individuals most similar to each treatment group member, were selected for the comparison group without replacement, such that each person could serve as a comparison for at most one member of the treatment group. Subsequent to the match, t-tests of statistical significance confirmed that the comparison group selected was highly similar to the treatment group on most measurable dimensions. The dimension that was most

problematical was prior earnings: participants and comparison group members in 14 of the 28 boards were found to have average preprogram earnings differences that were statistically significant; in every case, comparison group earnings were significantly more than those for participants, which could lead to inflated impact estimates.

In comparing our earnings impacts to the existing literature on training programs, our estimates appear to be biased upwards substantially for reasons associated with selection bias. First, it is likely that individuals seeking and receiving high-intensity services (e.g., occupational training) may be more motivated than those in low-intensity services in ways that are unobservable with existing data. Second, while we are relying on the same data source to measure employment and earnings outcomes for both participants and comparison group members, high-intensity participants may be disproportionately represented in jobs and industry sectors covered by UI relative to comparison group members, a situation that has surfaced recently in some of the Center's other workforce evaluation efforts (e.g., Schroeder et al. 2007). If this is in fact the case, then earnings impacts would be over-estimated using a quasi-experimental design with UI wage records as the source for labor market outcomes data. Unfortunately, we lack access to other data sources to investigate the size of such a problem for this project.

To address the presence of selection bias and to bring our earnings impact estimates in line with the evaluation literature on training programs, we have scaled our estimates of earnings and associated tax impacts down by 50 percent, statewide. While our impact estimates may still be biased upwards to an unknown extent by the presence of selection bias that has not been fully controlled for, we feel these adjustments are likely to have addressed most of it.

On a statewide basis, participating in high-intensity skills development services is associated with annual earnings impacts of \$1,848 over and above the impacts estimated for low-intensity services (i.e., \$564 for just the first year). The earnings impacts from high-intensity services are projected to endure throughout the 10-year period, in line with the evaluation literature on training and related services.

Appendix E. Sensitivity Analysis Results

The following table presents the results of varying several key analysis parameters on the annualized ROI estimates for participants, taxpayers, and society. The “benchmark” estimates, which are presented and discussed in the body of the report, are provided in the first row for sake of comparison.

Perspectives & Parameters	Participants		Taxpayers		Society	
	5 Year	10 Year	5 Year	10 Year	5 Year	10 Year
Benchmark Estimates <ul style="list-style-type: none"> • Employer Output 0.1 X Participant Earnings • 50% Employer Benefit Coverage • No Spending Multiplier • Zero Decay for High-intensity Earnings Impacts 	29%	38%	12%	25%	25%	35%
Employer Output <ul style="list-style-type: none"> • 0 X Participant Earnings 	23%	34%	n.a.	n.a.	21%	31%
Employer Benefit Coverage <ul style="list-style-type: none"> • 75% Coverage 	32%	41%	n.a.	n.a.	27%	37%
Spending Multiplier <ul style="list-style-type: none"> • 1.4 X Participant Earnings Only in High-Unemployment Areas 	n.a.	n.a.	n.a.	n.a.	61%	66%
Decay Rate for High-intensity Earnings Impacts <ul style="list-style-type: none"> • Decay 100% by Year 8 	n.a.	35%	n.a.	n.a.	n.a.	31%

Source: Authors’ computations.

If we assume *employers experience no benefits or returns*, either in terms of increased output or reduced vacancy-days, relative to the “benchmark” case, then the annualized ROI estimates drop across the board for the participant and societal perspectives for both time periods. The ROI rates drop to the 23-34 percent range for participants, and the 21-31 percent range for society.

Assuming *increased rates of employer fringe benefit coverage* from 50 to 75 percent boosts the annualized ROI estimates across the board. From the participant perspective, the ROI estimates increase by 3 percentage points each over the 5- and 10-year periods, respectively. The ROI estimates for society increase by just 2 points for both time periods.

Adding in spending multiplier effects for the 64 percent of boards expected to have above full-employment levels of unemployment has, by far, the largest effects of any of the parameter changes examined. For society, the perspective from which multiplier effects are realized, the annualized ROI estimates jump from 25 percent to 61 percent for the 5-year period and from 35 percent to 66 percent for the 10-year period.

Assuming that high-intensity earnings impacts decay fully by the start of year eight rather than continuing on through year ten has only modest effects on the annualized ROI estimates, in large part because the returns in those later years are already heavily discounted. The 10-year participant ROI falls by 3 percentage points, while the 10-year ROI for society drops by 4 points.