

2.7 Results of the training investment analyses

In this section we focus on the question “what monetary benefits are we getting back in return for the local public workforce system’s investment in training?” We review the results of other earlier studies on the impacts of training (“what we know”), and the evaluation frameworks available (“how we know it”) in Appendix F. We give here the results of our own analyses on the customized training and ITA-funded training funded by the local public workforce investment system for 216 individual customers in Baltimore. We present results to both a *cost-effectiveness analysis*, and a *return on investment analysis*. We conclude this section with some recommendations for future action, based on these findings.

Why is this important? There is a need to determine the costs and benefits of public investments in workforce development in a systematic fashion, so that comparisons can be made within the same program over time, and between different investment options. Given limited resources for training, it makes sense to put them where there is the greatest payoff. Cost-effectiveness approaches and training investment analyses can also demonstrate the value of workforce development efforts in terms that the business and legislative communities understand.

2.7.1 The value of training: what do we know and how do we know it?

Training magazine has estimated that American businesses budget almost \$60 billion a year for formal training.¹ The American Society for Training and Development (ASTD) calculates each year how that total amount spent emerges in terms of several “key ratios of training” (*see sidebar*).

In 2001, U.S. firms provided almost 24 hours of training to each employee at a cost of \$761 per employee. This level is equivalent to about 2% of their total payroll.

In the public sector, the U.S. General Accounting Office (GAO) found 40

employment and training programs worth almost \$12 billion administered by seven federal agencies in 2000.² At the state level, the National Governor’s Association found some \$572 million per year spent by 47 states on employer-focused labor training programs in 1998.³ By

Total training expenditures per training-eligible employee:	\$761
Total training expenditures as % of payroll:	1.9%
Percent of training-eligible employees trained:	78.5%
Training-eligible employees to trainer ratio:	367
Percent of training time via classroom:	77.1%
Percent of training time via learning technologies:	10.5%
Payments to outside companies as % of total training expenditures:	20.9%
Total training hours per training-eligible employee:	23.7

Source: ASTD, 2002

¹ “1997 Industry Report”, *Training* magazine, October.

² U.S. General Accounting Office (2000) *Multiple Employment and Training Programs: Overlapping Programs Indicate Need for Closer Examination of Structure*, U.S. GAO, Report #GAO-01-71, October.

³ *A Comprehensive Look at State-Funded, Employer-Focused Job Training Programs*, Employment and Social Services Policy Studies Division, Center for Best Practices, National Governors’ Association, Wash DC, 1999.

2002, state investments in these training programs had grown considerably: a GAO study of just 23 states found program budgets totaling over \$1.5 billion.⁴

Yet for all this activity and spending, there are only a handful of studies that have attempted to establish the generic “value of training” and then to put a specific dollar value on it. In Appendix F we review various attempts to do so, and their findings are summarized in the sidebar. We find there is great variation between these studies in terms of their *focus* (on the learner, the enterprise, or the program) and in the *methodologies used* (surveys, control group comparisons, random assignment, etc). Most have looked at the impact for the employer or the trainee, and have not usually addressed the issue of in terms of “return on investment”, especially for the taxpayer in cases of public funding.

Employers! Here's what research studies have shown *training* can do for you:

- reduce scrap rates
- increase productivity and the rate of productivity growth
- complement your other investments in new physical capital
- increase your total shareholder return
- increase your profit margins
- increase company income per employee
- increase price-to-book ratios.

To get at this aspect, we have broadly followed the “Phillips approach” to evaluating the return on investment from training. Phillips sets this within the broader context of the traditional four-level Kirkpatrick approach to evaluating training, by adding ROI as a new “Level 5” on top of Kirkpatrick’s first four levels (i.e. “reaction,” “learning,” “behavior,” and “results”). The Phillips ROI calculation itself is a variant of traditional cost/benefit (*see sidebar*).

This calculation is but one piece of a multi-step process (*see sidebar*).⁵ First comes planning the ROI study, including specification of its objectives, scope, methodology, and the data to be collected. This step involves identifying appropriate measures, locating data sources, developing collection instruments, and specifying timeframes and responsibilities. Baseline and post-training data can then be collected using surveys, questionnaires, observation, interviews, focus groups, assignments, action plans, performance contracts, or performance monitoring. The effects of the training itself then need to be isolated from the potential contributions of other factors, using, for example, experimental control group strategies, trend-line analysis, forecasting models, or professional estimation. The data then need to be converted to monetary values, using strategies like translating output data into profit contributions, historical cost comparisons, or management estimates. The resulting

How is ROI calculated?

ROI is “earnings divided by investment”, and can be considered a variant of traditional cost-benefit where:

$$\text{Benefit:cost ratio} = \frac{\text{Program Benefits}}{\text{Program Costs}}$$

Phillips’s ROI process compares *net* program benefits and costs:

$$\text{ROI (\%)} = \frac{\text{Net Program Benefits}}{\text{Program Costs}} \times 100$$

(where “net program benefits” are “program benefits” minus “program costs”)

⁴ *Workforce Training*, U.S. General Accounting Office, February 2004, #GAO-04-282, p3 and App. II.

⁵ Phillips J (1997) *Return on Investment*, Gulf Publishing/Butterworth-Heinemann, MA.

monetary values are then compared to program costs, including the costs of design and development, participant program materials, and cost of instructors, facilities, expenses and administrative overhead. The final step is to identify the intangible, non-monetary benefits, such as increased job satisfaction, improved organizational commitment, improved teamwork, improved customer service, and reduced complaints and conflicts. These are converted to monetary value where possible and credible, recognizing that some costs and benefits may have to be left outside the ROI calculation as "intangibles".

The Phillips "ROI Process" has grown in popularity and use recently, as the old justification for training being inherently "a 'good' thing for its own sake" has given way to the modern performance perspective. In this new thinking, corporations have to justify every additional dollar and staff position for training in terms of return on investment. Phillips's "ROI Institute" has developed protocols, a curriculum and certifications, and has built a critical mass of practitioners who now use Phillips's process, steps, and operational strategies. This movement has thus brought some consistency to approaches and some comparability to study outcomes.

The Phillips multi-step approach to ROI

1. Plan the evaluation.
2. Collect the baseline, treatment, and post-event data.
3. Isolate the effects of the training.
4. Convert the hard and soft data to monetary value.
5. Tabulate program costs.
6. Calculate the ROI.
7. Identify the remaining intangible benefits.

Applying this approach directly to training done by the *public* sector, however, runs into additional problems, noted by Phillips.⁶ These include the general absence of true revenues and profits for government activity, the relative paucity of "hard" data, the need to serve multiple constituencies when arriving at and communicating results, the restricted range of options open to managers for acting on any ROI findings, and the belief that government services are "essential" public goods not to be discontinued even if they show poor financial returns.

While these issues may indeed make the ROI task harder, they are more issues of discipline and appetite for adaptation. We suggest there is a more serious structural issue with attempting ROI in the public sector: namely, one of "scope". The ROI process developed for private sector training deals with costs and benefits *internalized* to the enterprise. This situation gives natural boundaries for deciding which costs and benefits should go into the calculation, and ensures they all enter the same formula. Public sector activity, in contrast, owes its very existence to the fact of *externalized* costs and benefits. These by definition preclude private sector actors from capturing all the economic benefits of their good or service, and remove incentive for private provision, thereby leaving the public sector to step in and raise taxes to fund the activity. In the public sector, therefore, the choice of which -- and whose -- costs and benefits to include in any ROI calculation is a very much more open one.

In practical terms, it also means it is not possible to use the ROI formula in the same way. The individual trainees benefiting from public investment are not bearing any of the cash costs of their training. The ROI from their point of view cannot be calculated because the denominator would be zero, and the outcome to the division would be infinity. Likewise, the training funder does not capture all the benefits, since the public benefits include increased tax receipts and reduced welfare spending, all accounted for externally to the training budget. The ROI from the training funder's point of view would have zero in the numerator and the outcome to the division would be a zero ROI.

⁶ Phillips J and Phillips P (eds, 2002) *Measuring ROI in the Public Sector*, ASTD Press 'In Action' series, Alexandria, VA.

We suggest this is a serious enough difference to require going beyond the present process, and conceiving of a new "Level 6" type of evaluation to deal explicitly with the public sector's return on investment. This would preserve some of the relevant operational steps of Phillips's Level 5, but clearly distinguish between impacts that are individual and societal, public and private, internal and external. For the local public workforce system context, these issues are manifested in the *costs* being borne by multiple levels of government and taxpayers, and the *benefits* accruing to both the individual customer (through higher individual income received) and multiple levels of government (through the customer being in a different tax and welfare situation).

2.7.2 Training investment in Baltimore: a pilot study

We attempt below the more comprehensive approach to studying the impacts and returns to training investment needed to account for all these costs and benefits, through a pilot study of two different types of training offered by the local public workforce system in Baltimore: "customized training", and "Individual Training Account-funded training". The main programmatic differences between these two types of training are summarized in the sidebar below. The key difference is in the presence of an employer for customized training, versus the individual paths taken by customers using ITAs to "purchase" their training "retail".

Characteristics of the two types of training		
FEATURE	CUSTOMIZED TRAINING	ITA-FUNDED TRAINING
<i>Route:</i>	Cooperative venture with employer	Individual path
<i>Location:</i>	Can be workplace or institution	Usually institution
<i>Content:</i>	Developed for particular needs of employer	Developed by training institution
<i>Curriculum:</i>	Usually modular, tailored	Usually fixed-length course in structured sequence
<i>Duration:</i>	Tailored to needs of employer: can be short (days or weeks)	Usually multiples of 10, 12 or 15 weeks in quarters or semesters
<i>Funding:</i>	WIA with 50% employer match	WIA or other state and local funds
<i>Employment:</i>	Usually guaranteed, if completed	No direct link to employment opportunity.

We obtained initial basic data from the Baltimore Mayor's Office of Employment Development (MOED) on 216 customers who started WIA-funded training activities and exited the program at various dates between May 2000 and June 2002, The "customized training" option was followed by 101 customers (47% of the total), and the "Individual Training Account (ITA) funded training" by 115 customers (53%).

We investigate below the differences between the two groups, in terms of their initial demographics, the training intervention (cost and time), and their job and earnings outcomes. We look particularly at their earnings change from the year before the start of training activities to the year after their exit from the program, and compare this difference to the cost of training, with the resulting number being a measure of the "cost-effectiveness" of these two types. Then we undertake a more comprehensive ROI analysis. (More details of data, sources, and findings for both the cost effectiveness study and the ROI study, are given in Appendix G).

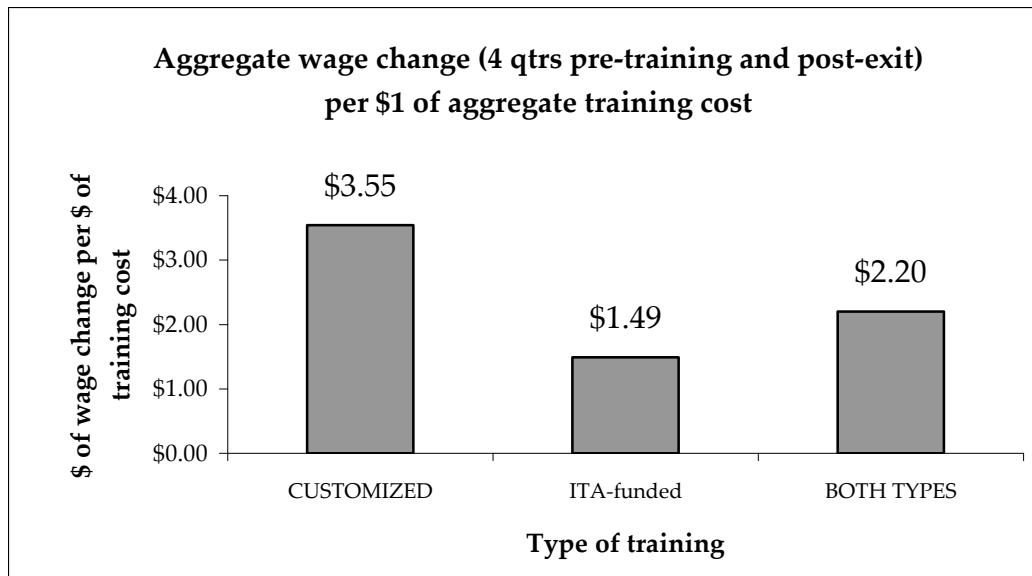
Study sample composition:

Analysis of the demographics of the two training groups showed that the customized group had a higher share of females, of people with families, and of employed people. It was also slightly younger than the ITA group, with a lower median wage, and a higher share receiving food stamps, prior to training. The ITA group had a higher share of dislocated workers, of unemployed customers, and of ex-offenders, and also a higher median wage, with a lower share receiving food stamps, prior to the start of training.

The median cost of training per customer was half as much for the customized group as for the ITA group, and the time spent between start of training and exit was shorter for the customized group than for the ITA group. The median *hourly* wage after training for those with wages was roughly the same for both groups, but for the *four quarters following exit* the customized group had a higher median wage than the ITA group. The customized group also had a higher median absolute wage *gain* in the four quarters post-exit compared to the four quarters before training. There is *no* significant correlation between the dollar cost of the individual's training and that individual's wage gain after training. About one in four trainees exhibited a wage *decline* after training compared to their situation before: this number is higher for the ITA group than for the customized group.

2.7.3 Cost-effectiveness analysis of the different training types:

Our chosen measure of “cost-effectiveness” for these two training groups is “aggregate dollars of customer wage gain per \$1 of aggregate training cost” (not including employer contributions⁷ and MOED staff time). The recommendations that follow assume this measure is something the workforce system should be trying to maximize. The rationale for this is that if there is a less-than-parity outcome (i.e. less than \$1 of wage gain for customers per \$1 of training cost) then customers would be financially better off if government simply gave them the dollars direct instead of putting them into training.



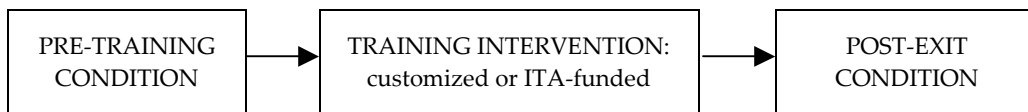
⁷ Employers are required to contribute a 50% match, but this need not be in cash, is difficult to account for, and is not under public control: hence, it has been excluded.

The summary finding to the cost-effectiveness analysis (see sidebar) is that customized training is 2.3 times more effective (at \$3.55) than ITA-funded training (at \$1.49). This finding suggests customized training is a better route for scarce training dollars. However, this large difference in cost-effectiveness between the two types of training may not *all* be attributable to the *training type* itself, because we also found:

- (i) There is *no* statistically significant correlation between the cost of training and the wages in the four quarters *after* exit, or between the cost of training and the wage *change* between pre- and post- periods, for either training type considered alone or for both.
- (ii) There *is* a significant correlation between wages in the four quarters *before* training and in the four quarters *after*, and between wages *before* training and the value of wages *gain*. These are statistically significant for customized training, for ITA-funded training, and for both groups together.
- (iii) There are also differences – and in some cases larger differences than the \$3.55 and \$1.49 found above – between different the cost-effectiveness for different customer groups: for example, between males (\$1.62 earnings gain per dollar of training cost) and females (\$2.60), and between those in the lowest quartile of the wage distribution before training (\$4.90) versus those in the highest quartile (-\$0.97). To the extent that these different customer groups are also disproportionately distributed between the two types of training, then this will account for some of the observed difference between training types, on this variable.

This finding of lack of correlations between training cost and earnings gain does *not* necessarily mean that the training is “unimportant”, “not effective”, or being “poorly done”, or that we cannot learn anything from the data on training type itself. It could just mean, for example, that the price of training in general in society is not itself related to training’s potential value for wage outcome, but perhaps more to the type of institution through which it is delivered. Some “cheaper” training institutions may be performing better than the more expensive ones, in terms of getting their customers into higher paying jobs.

What it *does* mean is that, in the



sequence, in order to understand the value of training we need to give as much thought and emphasis to the “pre-” step (assessment and selection of participants going in), and to the “post-” step (wage, longevity/retention of employment, likelihood of wage gain over time once in the job), as to the training type itself.

Attention has to be given to differences *within* the third, “post-exit” stage: median hourly wage at placement (a single point in time just after training) does *not* differ between customized and ITA-funded training types, but entire first year wages post-exit *do* differ, with the customized group doing *better* than the ITA group. At placement the median hourly wage for the customized group is \$9.98, while for the ITA group it is \$10.05 -- a difference of just 7 cents, or only 0.7%. Over the whole four quarters after exit, however, the customized group’s median wages were \$19,120, versus \$17,191 for the ITA group: this is a difference of \$1,929, or 10.1%. Thus, the relative value of different types of training lies not only in the ability to get a job, but also in being

able to access a job with potential for later earnings *growth*. This suggests examining the nature of the placements obtained through customized training, and focusing on maximizing those placements with longer job retention over time, and with good wage trajectories over time, in order to increase program cost-effectiveness. This approach then also requires not only at "placement-based success" measures, but also measures of earnings trajectories, if all the good the workforce system does is to be captured and demonstrated.

Our findings thus broaden our focus from our analytic starting point of just "comparing two training types". Nevertheless, within the training choice, there are still some interesting findings suggesting what can be achieved through each type, because cost-effectiveness is found to differ between training types for the *same* customer group. For example:

- dislocated workers in *both* training groups have a higher median wage than adults before training; this wage difference persists afterwards for dislocated workers in the ITA group, but in the customized group the adults catch up through training, with a median wage gain almost double that of the dislocated workers;
- females in the *customized* group have a higher median wage than males both before *and* after training, and females also have a higher median wage *gain* than males, but within the ITA group, this situation is reversed and males do *better* than females; this situation could result from females tending to be represented in different kinds of jobs with different wage levels than males;
- *high school grads* have the biggest median wage gain of the three educational status groups (dropouts, HS grads, and college grads);
- all but the highest quartile of wages achieve higher incomes through *both* types of training, but the *poorest* group of customers going in (i.e. those in the lowest quartile of the pre-training wage distribution), achieves a higher median wage after training, and a higher median gain in wages, through the *customized* route than through the ITA route;
- the customer group with the *highest* gain in median wage, out of 11 groups (with some overlap of individuals across groups) is that with wages in the *lowest* quartile *prior* to training – i.e. the poorest group to enter the system: the median wage gain is over 70% that of the second highest wage gain group of "all adults", and also the next, the second lowest quartile of the wage distribution prior to training;
- the customer group with the *lowest* median wage gain, out of 11 groups (again with some overlap of individuals across groups) is that with wages in the *highest* quartile prior to training: the median wage *change* for this group is actually negative (-\$1,064), and in aggregate its members earn afterwards 97 cents less per \$1 spent on their training than they did before; this figure is also negative for this group with both *types* of training (-\$1.53 for customized, and -\$0.75 for ITA); almost half of the one in four trainees who experience a lower income after training than before, are in this group;
- the "*highest yield*" customer group, in terms of *highest* wage gain per \$1 of training cost, out of 11 groups (again, with some overlap of individuals across groups) is the customer group with wages in the *lowest* quartile *prior* to training: these customers earn afterwards \$4.90 more per \$1 spent on their training than they did before; this group's figure is also the highest of any customer group's in either *type* of training, reaching \$7.45 more for customized and \$3.28 more with ITAs.

2.7.4 Return on investment (ROI) analysis for different training types:

The cost-effectiveness findings above showed the impact on wages for each \$1 spent on the training. Cost-effectiveness is not an ROI measure, as it shows only the individual's wage gain in relation to the public's cost. A full ROI requires incorporating the other monetary elements, such as change in taxes paid and welfare receipts, from before and after training. It also involves making some judgment about the persistence of any training benefits over time.

To begin this more comprehensive ROI analysis we took income from the wage record data, and used family size and structure information from the MOED data to decide customer tax filing status. We then put this information through TurboTax™ to simulate the federal and state tax returns that would have been filed by these 216 customers in both the last tax year immediately preceding the start of training activity and the first tax year after their exit from the program. These tax years were linked to different individuals' unique start and exit dates, respectively (all between 1999 and 2003, inclusive). These tax simulations give the change in value of taxes paid (federal, state, and local income tax), and in those credits implemented through the tax system (i.e. the earned income tax credit and the child tax credit at the federal level, the earned income credit and poverty level credit at both the state and local level, and the refundable earned income credit at the state and local level). The complicated sequence of steps in calculating these elements is shown in the flowchart of Chart 2.7.1.

Changes in the other three welfare and income supports that are *not* routed through the tax system – i.e. the Temporary Aid to Needy Families / Temporary Cash Assistance (TANF/TCA) payments, Food Stamps payments, and Child Care Voucher payments – were obtained for these 216 customers from original agency data for these programs where possible. In the case of TANF/TCA, dollar amounts were available for only part of the time series, but program participation was available for the remainder. For the that part of the series, known numbers of dependents and income for each case were applied to the TANF/TCA dollar benefit scale, to arrive at simulated dollar amounts.

We then aggregated the value of each of these tax and welfare components for all 216 trainees in both the tax year *prior* to start of training activity, and in the tax year *after* exit from the program, and then calculated the pre/post differences. The separate before and after values are shown in Chart 2.7.2, and the values of the differences are shown in Chart 2.7.3. Several points are worth noting about the patterns shown in these two charts, before moving on to the ROI calculations:

- *The income bars clearly dominate the picture.* Differences in income – both between training types and between before and after situations -- are thus going to have the most impact on final results.
- *Compared to the aggregate value of income, the value of formal welfare payments is surprisingly small,* given the disadvantaged nature of most of these trainees. The aggregate value of welfare benefits for all customers in both types of training before their start (when customers are financially worse off than after) is only equal to 4.5% of their aggregate income (i.e. federal AGI). In fact, there are low participation and receipt rates for this customer group across the range of “welfare” programs. Of all 216 cases, only 3 received any TANF/TCA in the 12 months before start of training and only 3 received it post-exit. Yet 41 of the 216 customers (19%) received TANF/TCA at *some* time during the total 69-month period covered by the TANF/TCA dataset: thus, for those who *do* receive it, the timing of welfare benefits does not seem to be meaningfully integrated with the timing of training activities.

- *This aggregate value of welfare benefits in relation to income is also lower than that of tax credits, which are equal to 13.4% of income for all customers before training.*
- *The relief produced by the federal tax credits against federal income tax liability of customers is lower than that provided by the state and local tax systems against state and local tax liability, respectively. The two main federal credits (earned income credit and child tax credit) take down aggregate federal income tax liability by 24.3%, while the Maryland credits (earned income credit and poverty level credit) reduce Maryland tax liability by 111% and the local credits (earned income tax credit, poverty credit, and refund of earned income credit) reduce local liability by 129%.*
- *Some of these credits and benefits can appear to have perverse outcomes as “support”, in that not all accrue to customers with the lowest incomes. The federal child tax credit can only be claimed against federal income tax liability: trainees with children but with no tax liability because they are poor do not receive its benefit, while others who are better off financially and pay tax and have children, may receive it. The federal earned income credit can be received as a cash refund even if there is no income tax liability, as long as there are earnings: thus, previously unemployed customers may not have received any EIC before training, but if they move into a job as a result of training, they may then receive EIC based on their new low earnings. Similarly, though TANF by definition is for the “needy”, its work requirement means that for some levels of income it can actually increase as a result of getting a job. As a result, in sum the tax credits and welfare payments do not necessarily go down after exit, as might be expected when people’s economic situation improves. In some cases they may go up, because the benefits are nowadays structured to encourage and reward participation in work rather than to support the neediest.*

The relevant tax components were then selected and plugged in as either the “program benefits” portion of the ROI calculation formula (i.e. the monetary value of increased tax revenues combined with changes in tax credits and welfare benefits), alongside the “program costs” (i.e. the cost of training), in Table 2.7.4. This table shows how they were used to calculate the ROI for each type of training.

The main result is that *for neither of the two training types is a single year after training enough time to yield a positive return on investment.* The customized training ROI is minus 9.6%, and the ITA-funded training minus 57.9%, for the first year. Both types combined (216 cases) have an ROI of minus 41.2%. For just the first year after exit, the combined additional taxes paid and changes in welfare benefits do not themselves yet outweigh the aggregate cost of investment in the training. Even for the customized group, aggregate training costs of over \$237,000 still outweigh the aggregate value of combined tax increases and welfare benefit changes totaling under \$215,000.

This contrasts sharply with the high and positive outcome to the previous cost-effectiveness analysis, where each \$1 of training investment yielded over double its value (\$2.20) in customer wage gain. This different result with ROI is because the program benefit in the numerator of the ROI calculation is not the individual’s wage gain as it was in the cost-effectiveness calculation, but instead is the combination of the increases in taxes paid and the changes in benefits received as a result of that wage gain – a lower number.

However, customers will likely have their job for *more* than one year after training, and thus later years’ benefits should also be included in the calculation. We can calculate the time to positive returns for each group. Chart 2.7.5 shows the cumulative ROI from one to ten years post-exit. These calculations assume the customer retains this job, or another with equal earnings, over the entire ten years, and that job retention and all earnings are a function of training. With these

generous assumptions, the cumulative ROI for the customized group becomes a positive 81% in the second year after exit. The analogous figure for ITA-funded training is still negative in year two, at minus 16%, but in year three both separate training types have a positive cumulative ROI.

When the two training types are combined, the aggregate cost of both types of training (\$684,000) is exceeded by the program benefits by the end of year two (when program benefits reach over \$805,000). The cumulative return on investment for both training types combined then climbs steadily to almost 500% after ten years, if the program benefits last that long. By separate training type, the ROI is higher for customized training versus ITA-funded training throughout the period because post-exit earnings are higher for the customized group and their training costs are lower to begin with.

The question this begs, however, is "how many years of program benefits is it reasonable to include in the ROI calculation?" Different researchers in the past have used varying lengths of time as the period for training's benefits to persist. MDRC's evaluation of JTPA training used five years, and Benson's 1997 analysis of workforce development programs (including non-training programs) in Silicon Valley used twelve years, for example.⁸ Both these time-spans seem overly generous today, given the increased churning of the economy since those studies were done, and given the common assertion that in the "knowledge economy" the workplace value of what workers know "erodes" at roughly 20% a year.

One approach would be to find empirical support for any "persistence" of training benefit assumptions. This question of persistence actually has two elements: the proportion of all customers retaining their job in subsequent years, and how the earnings of those retaining their jobs change over time. For each of these elements, there is some relevant (but gross) national data, and some actual (but limited) local sample data, on both the job loss and earnings trends elements. A combination of these can inform and provide a "persistence adjustment" to the first set of ROI figures presented in Chart 2.7.5.

With regards to the *job retention* element of persistence, the federal Bureau of Labor Statistics (BLS) has disaggregated total job change into its two component parts of job growth and job decline, for 35 metropolitan areas in the Midwest and Northeast (not including Baltimore), over the period 1992 through 2000.⁹ The sub-group of "low-growth" MSAs (in which Baltimore would fit), *created* new jobs at a rate of 12.2% of total existing employment a year during this period. At the same time existing jobs were being *lost* from these areas at a rate of 11.0% of total employment per year. The net result of these two components was total employment gain in the high-churning "new economy" of the 1990s. More recent BLS analysis has extended this nationwide for up to December 2002. This period includes the 2001 recession at the middle of our study period. BLS found gross job losses¹⁰ of 8.0% in the quarter ending December 2001, falling to a rate of 7.3% in December 2002.¹¹ Averaging this more recent experience over the five quarters produces a job loss figure of 7.6% that could be incorporated into our persistence adjustment.

⁸ Benson D and Tran V (2002) 'Workforce Development ROI: Silicon Valley Private Industry Council', pp173-107 in Phillips J and Phillips P (2002) *Measuring ROI in the Public Sector*, IPMA/ASTD, Alexandria, VA.

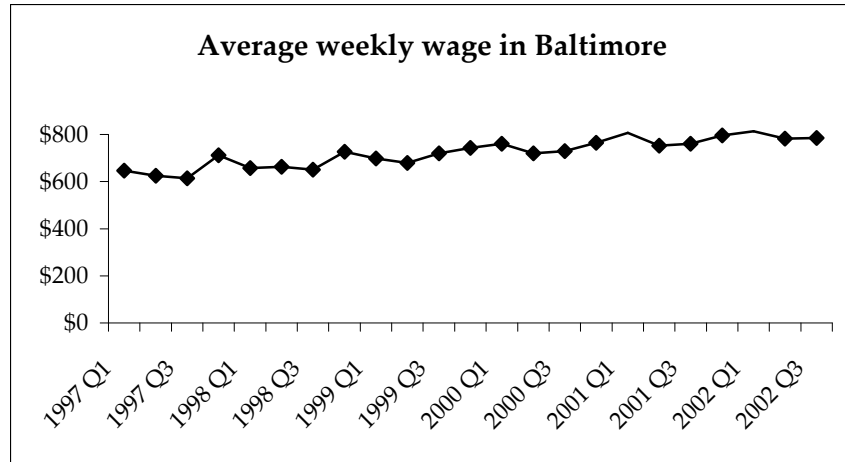
⁹ Faberman J (2002) "Longitudinal analysis of economic impacts: a case study of the rust belt", Bureau of Labor Statistics, <http://www.bls.gov/ore/pdf/st020260.pdf>, and (2002) "Job Flows and Labor Dynamics in the U.S. Rust Belt", *Monthly Labor Review*, September 2002, pp3-10.

¹⁰ "Gross job losses" are defined as "declines in employment in existing establishments or from closing establishments."

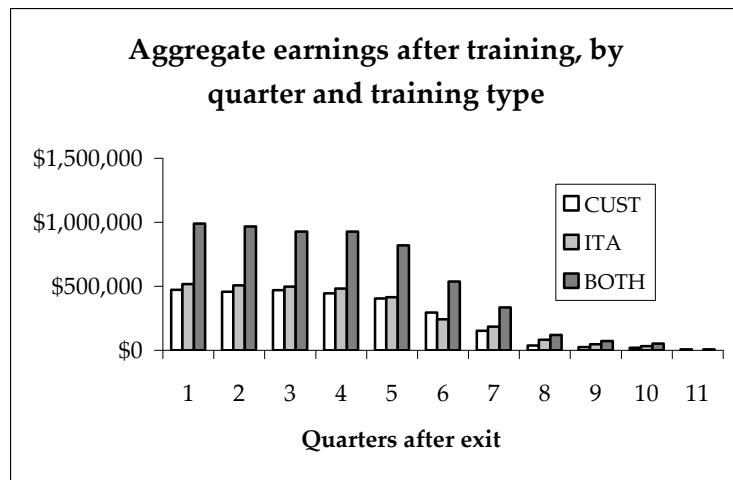
¹¹ "New quarterly data on business employment dynamics from BLS", Bureau of Labor Statistics *News Release* #03-521, Sept. 30, 2003.

With regards to the *earnings change* element of persistence, other BLS analyses¹² have shown that average hourly earnings in the private sector increased at about 3.7% per year throughout the 1990s. Maryland Dept. of Labor, Licensing, and Regulation data allow this to be updated for just the city of Baltimore.¹³ The chart shows the average weekly wage for all private sector workers in all occupations in the city, from January 1997 through September 2002 (the latest available data).

Annual changes in earnings vary from 3.9% to 5.3%. For the 25-month period covering our customers' starts and exits (May 2000 through June 2002), wage gain for the city was 8.8%, which would be roughly equivalent to a 4.4% annual gain and in the middle of the range of annual figures.



Our own training data do allow us to look at actual earnings change for this group, but only for up to 11 quarters after exit, and even then not for all 216 customers. Aggregate earnings are shown in the sidebar below. Unfortunately, the number of "missing" cases grows as we come closer to the present, when employers are still in the process of reporting data. By the 8th quarter after exit, there are just 31 cases with earnings data out of the original 216. As a result, the *aggregate earnings* figure shows a decline of over 52% from year one after exit, to year two. This fall off does not exactly match our need for an earnings change estimate, since it includes both the "truly missing" and those customers whose earnings numbers simply have not entered the wage record system yet.

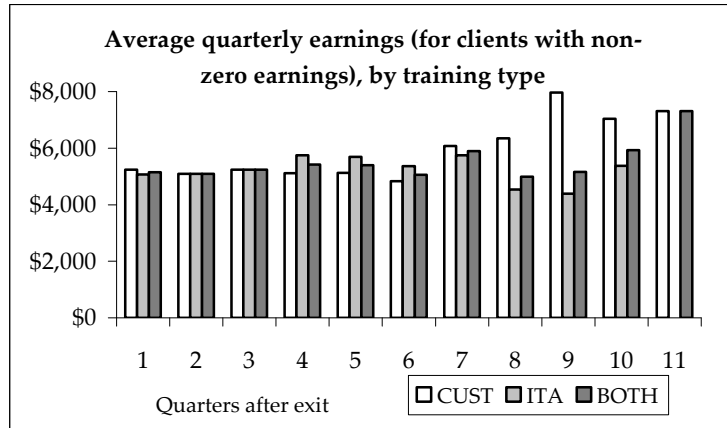


¹² Hatch J and Clinton A (2000) "Job growth in the 1990s: a retrospect", *Monthly Labor Review*, December, pp3-18.

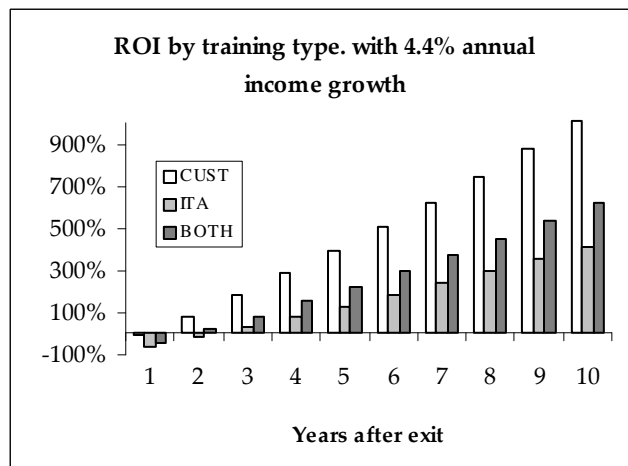
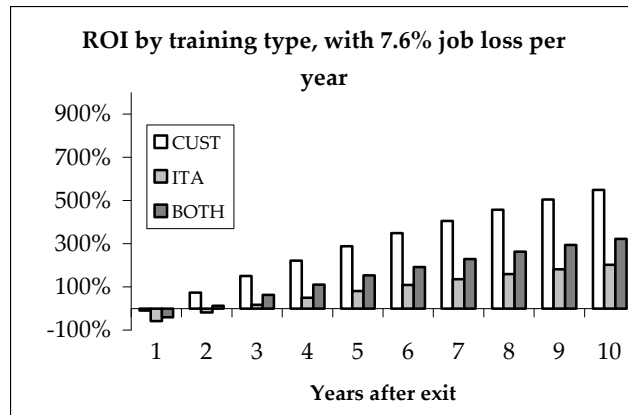
¹³ From: <http://www.dllr.state.md.us/lmi/empay/tab4bcit.htm>

We can attempt to get round this data “thinning” over time by just looking at *average* earnings. These show only a 6.8% decline from year one to year two, but this average is calculated on

customers including a varying number with genuine (i.e. non-missing) \$0 earnings. The trend in earnings for the group is being brought down by those customers who have none, and is thus a poor measure of income growth for those with earnings. If these \$0 earnings cases are excluded, the average quarterly earnings of just those customers *with* earnings, by training type, for up to 11 quarters after exit, are shown in the chart. This measure, with these cases, gives an annual increase in average earnings from year one after exit to year two, of 8.3% for the customized group, 1.0% for the ITA group, and 2.1% for all 216 customers in both types of training. These numbers are “actuals” for these groups, but cover only the changes from first to second years after exit.



Now we have empirically-supported estimates for the *job retention* and *earnings change* elements of training benefit “persistence”. If the trainee group loses jobs at the same rate as the overall economy does, they will see a 7.6% reduction in the number employed each year. (This ignores the unknown number of customers who lose their job but go on to another within the same quarter). For earnings growth, city-wide data suggests that if this customer group experienced the same upward wage trend as the whole city labor force did in the study period, those customers in work with earnings should see a 4.4% increase in earnings per year. The sample data also showed us that in the near term, earnings growth for the customized group is higher than for the ITA group, indicating this part of the persistence adjustment should itself differ by training type, and that difference could be as much as from 1% to 8%. Accordingly, we take the data for both training types for year one after exit from our sample data (because they are “actual” figures) and for years beyond that, we apply rates of job loss and earnings change, at a variety of



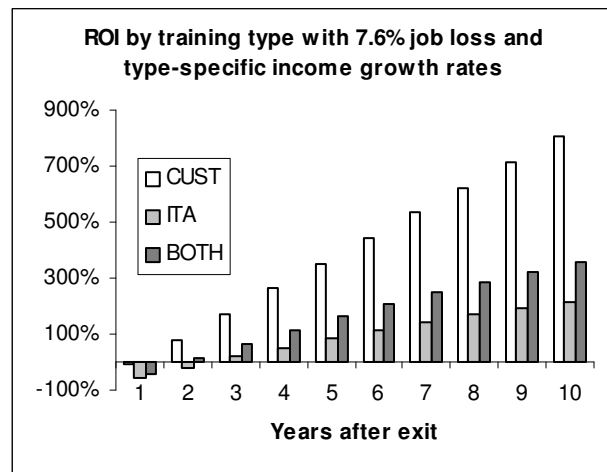
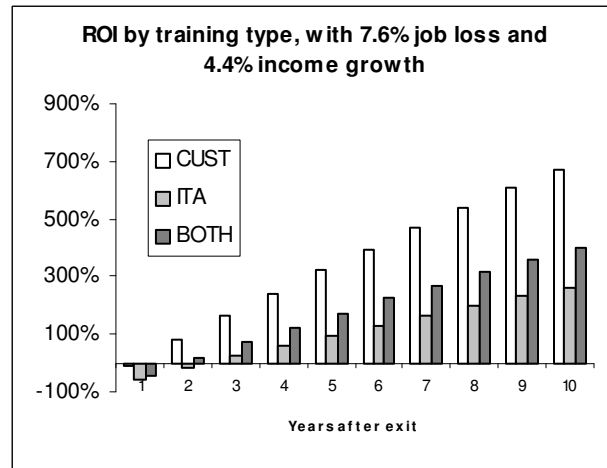
levels to gauge the sensitivity of ROI results to the persistence adjustment. (The charts have been forced to the same vertical scale to allow immediate visual recognition of differences in the ROI outcomes).

The first two charts above show the sensitivity of ROI numbers to the different persistence elements *separately*. The shorter bars in the first chart indicate that the rate of job loss (at 7.6%) has a relatively greater impact on the eventual ROI numbers than does the rate of earnings change (at 4.4%). ROI is thus more sensitive to job retention than it is to income growth, at these expected levels.

The third chart shows the ROI when these two rates are combined: job loss is at 7.6% per year, and the earning gain is at 4.4% (applied to only those jobs remaining after the job loss each year). Naturally, these ROIs fall in between the values found in the first two charts, because we are mitigating the effects of loss through the retention element, with gain in earnings.

The fourth chart combines the retention and earnings elements again, but uses the training type-specific income changes of 8.3% for the customized, 1.0% for the ITA, and 2.1% for both groups combined. This scenario is the most likely of those considered, based on the national and local data we used to come up with these conditions. If we looked only at the first two years after training, *only the customized training would show a positive return on investment*. The ITA group still has a minus 19% ROI in year two. However, the customized group's ROI of 81% is large enough to sustain a positive ROI of 14% for both types combined, if we use a "portfolio" logic to training as a whole. Cumulative ROI for the customized group also climbs sooner and higher, because of the difference in income growth rate applied for that group. In the first year that both training types show a positive ROI (i.e. year 3), customized training has a cumulative ROI of 171%, compared to 18% for ITA and 67% for both types combined. At the five-year mark, this gap is wider still, at 352% for training and 84% for ITAs.

It is worth noting that in *none* of these four scenarios – and in none of many other variants modeled with the data but not reported on here – do the ROIs for all groups (customized, ITA, and combined) become positive until the third year after training. There is a delay in public investment being recouped whatever the type of training and whatever the exact values of job loss and earnings change applied, within the likely levels used here.



What have we learned from this section, and what recommendations does it support?

1. It must be remembered that these results are drawn from a sample of trainees receiving these types of training at a particular time. We do not have any observations of other types of job seeker customers in other training at other times. Nor do we have results for comparable customers who did *not* receive any training. Nevertheless, these before-and-after changes did occur for these particular customer groups trained at these costs. These results, in this situation, show that training *is* associated with wage gains for almost all groups of customers, that the gain is highest for those who previously were the poorest, and that there is a *positive financial return to the public's investment*.
2. Methodologically, results show a return on investment analysis *can* be done in this data environment. The "cost effectiveness" analysis is *easier* to do than the full-blown "return on investment", because the tax estimation task (which is the main difference between the two types of analyses) is the most labor-intensive analytic task. "Cost-effectiveness" is also *more* "accurate" than ROI, because the additional tax estimation piece in ROI involves making more assumptions (due to a lack of information on spousal income and other tax deductions). Cost-effectiveness results involving wage gain tells us *less* than an ROI does, but it may be more intuitively understandable to many audiences.
3. Specifically from the *cost-effectiveness* analyses, results show there can be large differences in cost-effectiveness by *type* of customer. The ability for the system to use this knowledge to route particular customers into different training types is constrained, because job seeker and employer customer choice is an important part of the process. If this routing could be done, the findings suggest the following strategic choices that might increase the cost-effectiveness of training even further:
 - Work with employers to develop *more customized training opportunities* through which to train customers.
 - Within the parameters of customer choice, and other things being equal, and given the possibility of steering customers into different training types, then cost-effectiveness would be improved if ITAs were saved for: (a) *dislocated workers*, because they are the only customer group whose wage gain for each training dollar is higher through the ITA type than through customized training; and (b) *those in the lowest quartile of the wage distribution* coming into the training stage, because they this group is twice as cost-effective as other groups in that training type.
 - *Pick less expensive training providers rather than more expensive ones*, for the same kind of customers, the same type of occupational training, and the same level of provider outcomes. This choice would not itself hurt customer wage outcomes on average, but it would improve cost-effectiveness because it would save money for the same wage outcome.
 - If the workforce system has to "ration" training funds and select participants from a larger group of applicants, and if there is a choice of trainees to go into the different training types, then, in general, cost-effectiveness (wage gain per \$1 of training cost) could be maximized through:
 - selecting those who are poorest (i.e. in the lowest quartile) before training;
 - avoiding those who are already the highest (i.e. upper quartile) earners: use additional non-training services instead, to help place them in their next job;

if they have to be trained, then the ITA route would be more cost-effective than the customized route;

- picking high school grads over college grads, to receive training;
 - encouraging females, school drop-outs, and those from the lowest income quartile, into customized training, where their wage gain per \$1 of training cost is much higher than for these same groups in the ITA type.
4. As the above recommendations are based on findings about group medians, we also need to recognize that individuals differ and that these recommendations cannot be blindly applied prescriptively to everyone, solely on the basis of their group's characteristics. Individual motivation to succeed can be the most important factor in learning outcomes. The few groupings with data here do not fully capture all the information about an individual's learning potential. The workforce system needs to continue to assess individuals for their potential to exceed their group's medians.
 5. Given the overall low incidence of welfare benefit receipts in these trainees' records for the four quarters before and after training, combined with the intermittent appearance of benefits in earlier quarters of the customers' records, some thought needs to be given to how the welfare and the workforce systems intersect. Welfare benefits are primarily driven by income and number of dependents, while workforce services are tier-in-process driven. What the customer receives from each system will not necessarily overlap in time. Yet the case can be made that income support is even more necessary when customers undertake training responsibilities – in many cases on top of family and other job commitments. Thought should be given to *better coordinating the timing of income supports with training activity*, so that prospects for training progress and success are better leveraged towards the outcomes that both the welfare system and the workforce system are striving for.
 6. Specifically with regards to the ROI analysis:
 - Both types of training can show positive -- and over time, large -- returns on the taxpayer's public investment. Over time, the costs of training are exceeded by the combination of increased tax receipts from trainees and reduced welfare benefits. Since the costs of training are only borne once but the benefits persist over time, this positive effect is cumulative in the years beyond training.
 - In aggregate, more than one year of post-exit earnings is required for either type of training to show a positive ROI. The time-to-payoff after exit is shorter for the customized group (generally after year 2) than for the ITA-funded group (generally after year 3). *Hence job retention over at least that length of time is key. Retention also weighs more heavily in the ROI outcome than does earnings change over time, given the levels used here.* This suggests the public's investment can be better safeguarded by: (a) supporting customers during and after training with services designed to assist them in completing training successfully and keeping their jobs once placed (not a usual emphasis in the WIA system, which makes it difficult to spend funds after placement), and (b) asking employers for a commitment of two years work for the customer (subject to satisfactory employee performance and enterprise viability), in return for the public investment in the employee's training.
 - Persistence of benefits is key to achieving positive ROIs, and yet only general baseline data are available to inform any assumptions about how far and at what rate

training benefits can be extrapolated into the future. More research needs to be done on whether the general assumptions used here do fit the empirical reality of these training groups, with regards to their actual job loss rates and their earnings growth trajectories.