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On the Feasibility and Advisability of Conducting a Return on Investment Analysis of the Indiana Workforce System

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ON THE FEASIBILITY AND ADVISABILITY OF CONDUCTING A RETURN ON INVESTMENT ANALYSIS OF THE INDIANA WORKFORCE SYSTEM

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By

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The Lilly Endowment and the Joyce Foundation are investing in efforts to make substantial improvements in the workforce and economic development systems of Indiana. The Joyce "Shifting Gears" grant is targeted on setting priorities and strategies to engage, educate, and elevate Indiana's workforce. The grant is being led by a policy team that is setting goals and bringing together resources and expertise to work on accomplishing the goals. Two broad strategies that have apparently been identified include increasing the high school graduation rate of Indiana's students and improving the basic skills of incumbent workers. Concurrent with the work of the Joyce grant policy team and the Lilly grants has been a major administrative data base development effort led by the Department of Workforce Development (DWD) called IWIS (Indiana Workforce Intelligence System). Part of the rationale for developing IWIS will be its ability to provide data that can be used for program monitoring and quality improvement.

As part of its involvement in the efforts to upgrade and align the workforce and economic development systems, the Chamber of Commerce has contracted with the Upjohn Institute to do a study of the feasibility and advisability of conducting a formal return on investment study of the state's workforce programs similar to projects that the Institute conducted in the states of Washington and Virginia.

We very much appreciate the opportunity to advise the Chamber and the Joyce Policy Team. In short, our finding and recommendation is that a formal return on investment study of workforce development programs in the state is feasible, but the advisability of pursuing it depends critically on getting full cooperation from the state agencies that administer program, especially DWD, and on getting solid support from either the Governor's Office, legislature, or both. The latter support would make clear who is the audience for the study and how the information would be used.

We have provided an appendix to this document that specifies a scope of work, schedule, and budget that would accomplish a return on investment study should the full cooperation of the states' agencies and oversight support of the Governor's Office or legislature be garnered. However, even if the decision makers decide to refrain from investing resources in a formal study now, we make several recommendations concerning steps that could be taken to pave the way for rigorous return on investment studies to be done in the future.

In this brief paper, we present a general discussion about net impact evaluations, present a schematic description of the Indiana workforce development system, provide a vision of how that system and its constituent parts can be monitored and evaluated, set the stage for how return on investment analyses could be undertaken in the future, and provide some recommendations. As noted, an appendix to the paper outlines a scope of work to conduct a return on investment study and details an estimated budget of about $60,000.

NET IMPACT EVALUATION AND RETURN ON INVESTMENT

Public workforce development programs in Indiana may be considered an investment in the human capital of state residents. In general, these programs are aimed at reducing barriers that individuals may face in attempting to establish economically sustainable careers. Often times, the programs attempt to enhance individuals' skills. The fact that the programs use public resources to fund these investments implies that the programs are accountable to taxpayers. We argue that the accountability takes (at least) two forms. Program administrators need to be monitoring the performance of programs; the purposes of which are to measure resource effectiveness and equity of outcomes. In addition, the state should be conducting net impact evaluations and return on investment (r.o.i.) studies in order to assure taxpayers that their

investments are having a positive impact on the state's economy. These two forms of accountability are discussed in the following paragraphs.

Performance Monitoring

The purpose of performance monitoring is to measure the usage of resources and the flow of clients in order to manage as effectively as possible the resources that are available. In general, administrators are concerned about *efficiency*, which is providing the greatest amount and highest quality of service given the level of resources, and about *equity*, which is providing services fairly. Administrators need to ensure that the characteristics that are being measured and to which they are being held accountable are important, not just things that are easily measured. Furthermore, administrators need to ensure that measures are consistently defined over a sufficient length of time to have some confidence in their levels and trends.

Performance monitoring is most useful when the information can be benchmarked. That is, administrators who are undertaking performance monitoring in order to improve their program's effectiveness will need to make judgements about trends or levels in the data. Benchmarks, which are summaries of comparable indicators from other agencies/programs or other time periods, can be used to formulate those judgements. Performance standards are intended to be a method of benchmarking performance data.

In short, the purpose of performance monitoring is to inform program improvement. The audience for such monitoring is administrators. From an administrative point of view, a nice aspect of performance monitoring is that it can occur in "real time."

Net Impact Evaluation

The purpose of a net impact evaluation is to evaluate the outcomes of the program for participants relative to what would have occurred if the program did not exist. In other words, it answers the question of how the program has changed the lives of individuals who participated in it relative to their next best alternative. The data that are used to address this question are quantitative, and the evaluation should attempt to examine results by subgroups because there may be systematic relationships between program outcomes and participant characteristics. The audiences for a net impact evaluation are the funding agency(ies) and program administrators. For publicly funded workforce development programs, the owners are the taxpayers, and their agents are state or federal legislators or evaluation branches of the executive agencies.

Individuals who participate in training or educational programs may experience successful outcomes. However, it is not always clear that individuals' positive outcomes were the direct result of their participation in public training programs. There could have been some other factor(s) such as an improving economy that caused positive results. In social science evaluation, this is called the attribution question. Can participants' successes be truly ***attributed*** to participation in the program or might some other factor coincidental to the program have played a role?

A net impact analysis must be conducted to answer the attribution question. This analysis attempts to answer the question of what would have happened to participants *if there were no program* and individuals were left to their next best alternatives. To find the answer, we must construct a comparison group of individuals who are very similar to the participants in each of the programs but who did not receive training or enroll in education. We observe both the participants and comparison group members over time. We then attribute to the program any

differences in outcomes that we observe for program participants to those of comparison group members.

In order to derive a comparison group for the public education and training programs, we use individuals who encountered the WorkOne system, but who did not participate in a public program. The assumption here is that the next best alternative to the public workforce development system is WorkOne. Of course, the individuals who use WorkOne may be systematically different from the individuals who went through a program, so we conduct a statistical match between the data sets in order to identify individuals in WorkOne who are most closely like the clients of the public training system. The technical term is that we are using the WorkOne services as the counterfactual.

The net impacts of workforce development programs are likely to be positive for participants. (The programs are delivering valuable skills to individuals who will use those skills in the labor market.) However accountability generally needs to go beyond positive net impacts. Of interest to the public is whether the net impacts (outcomes for program participants minus outcomes for similar individuals comprising a comparison group) aggregated over all participants will have exceeded the costs of the program. Thus to get a full picture of the return on investment, it is necessary to compare the programs' net benefits to their costs.[1]

The attribution of the net impacts to the program intervention is confounded by at least four factors. The first factor is definition of the treatment. Workforce development programs usually tailor services to the individuals being served. Thus, each participant may receive slightly different services. Furthermore, participants control their effort. So, even if participants

[1]If we were to be able to appropriately monetize all program benefits and to accurately discount their expected future value, then return on investment would be the interest rate that equilibrates discounted benefits and costs.

were given the same "treatment," they may exert more or less effort in learning or applying the skills or knowledge being delivered to them. Furthermore, some individuals may not complete the treatment. Second, in order to estimate the *net* impacts of a program, it is necessary to compare program participants to another group of individuals who represent the "counterfactual," i.e., what would have happened to the participants absent the program. Designation of that comparison group, and concomitantly, having adequate data concerning members of the group are crucial for estimating net impacts. Having data may be difficult because the comparison group members did not receive the "treatment."

The third factor that may confound attribution is the definition and measurement of the outcomes. Performance measurement is aimed at inflows into and outflows from a program, whereas evaluation is likely to focus on outcomes after clients have received the treatment. The performance measurement system may not be designed to collect such information. Finally, the dynamics of program interventions and outcomes may make attribution difficult. In particular, receiving the treatment may require a significant amount of time. So the question becomes whether outcomes should be measured after program entrance or after the treatment ends. (Furthermore, individuals who receive the treatment may not complete the program.) Observations that are well-matched at the time of program entrance may differ considerably if the reference point is program exit simply because of the business cycle or other changes that may occur over time

THE INDIANA WORKFORCE DEVELOPMENT SYSTEM

This section of this brief describes the programs that comprise the public workforce development system in Indiana. The section embeds the system in a very general framework for

the labor market. Our depiction of the workforce development system is based on the recognition that there is a demand and supply side of the labor market – employers and workers. The way that we depict the demand side of the market (employers) is as a set of jobs. Most of those jobs are filled; although some of the jobs are open. As depicted in figure 1, the jobs that are filled can be characterized as having incumbents who are superstars, solid performers, or high turnover/low value-added workers. For the most part, the public workforce system appropriately does not intervene at all with the first two categories. On the other hand, it behooves employers (and the state) to minimize the percentage of jobs in the latter category, which we argue may be done by upgrading skills through public programs.

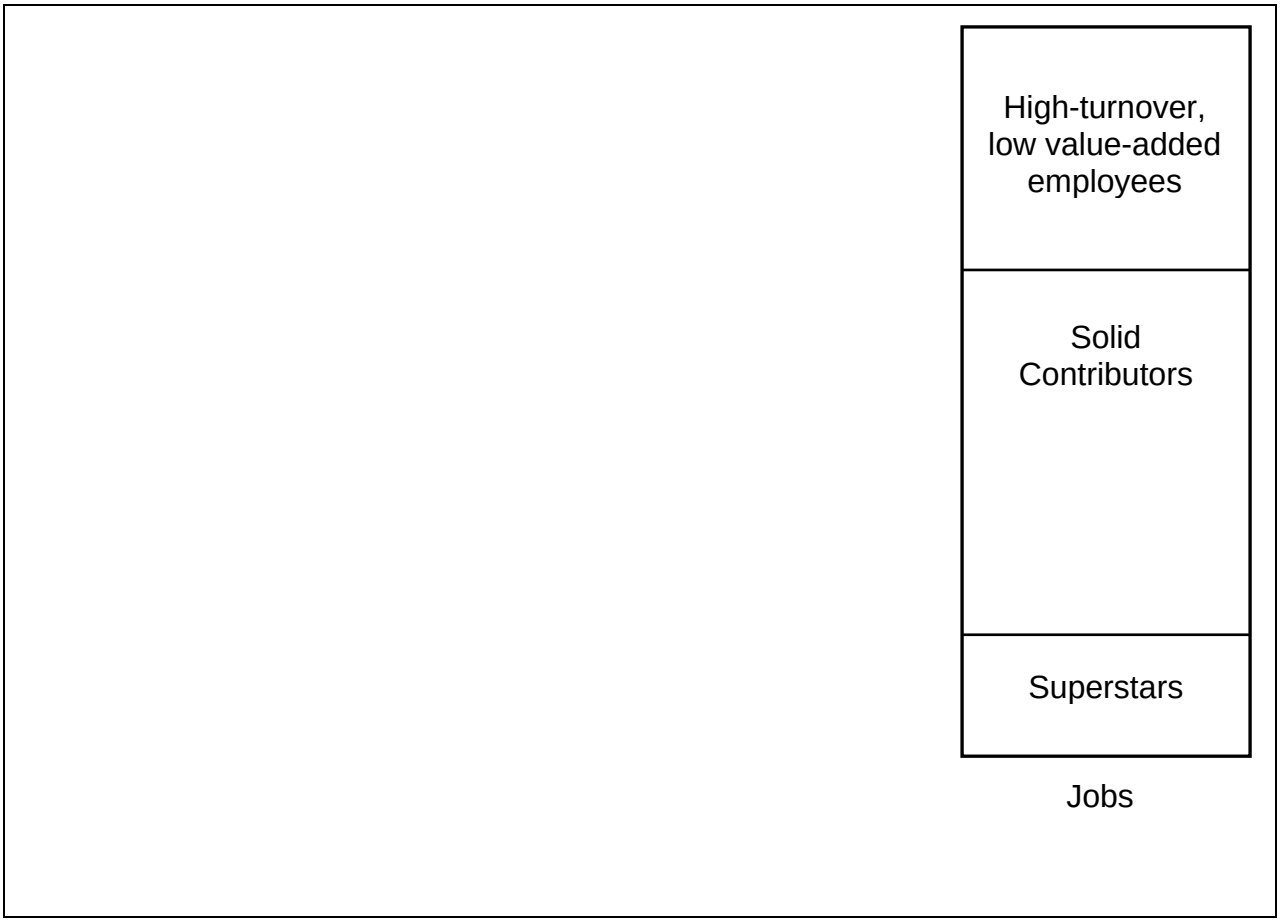

Figure 1. Demand Side of Labor Market.

On the other side of the labor market are individuals who are workers or potential workers. Again, the majority of the individuals in this set of people are employed; however, some of them may be unemployed. According to DWD data, the 2005 labor force in the Hoosier state numbered about 3.2 million individuals, of which 3.0 million were employed (DWD, Highlights of State of Indiana, 2005 Edition). In figure 2, we categorize these individuals as productive, underemployed, or having severe employment barriers. Underemployed individuals are those for whom skill training or education may be warranted. Severe barriers include substance abuse issues, mental or physical impairments, previous incarceration, homelessness,

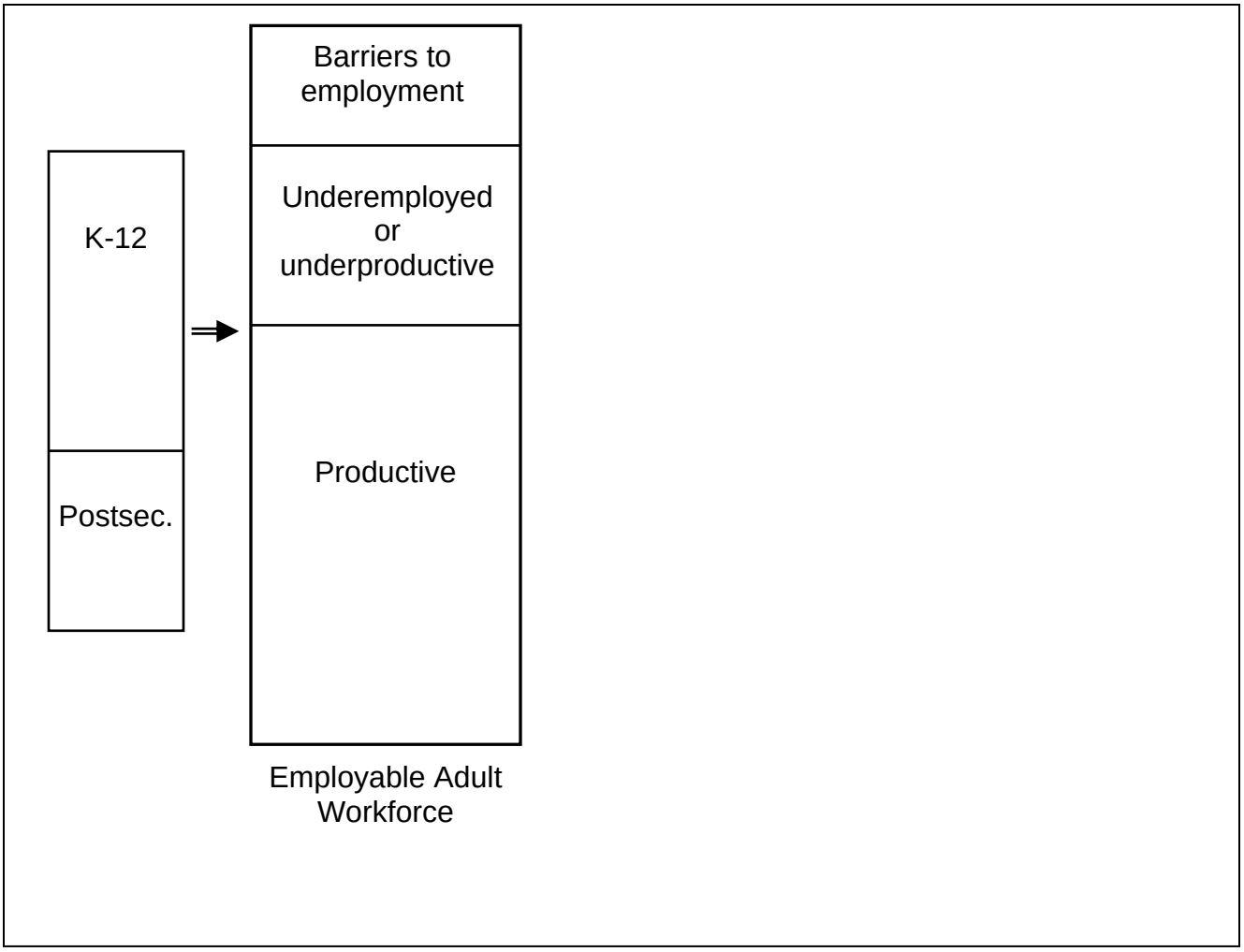

Figure 2. Supply Side of Labor Market.

and so forth. Issues with which public policy needs to grapple are whether and if so, how, the individuals who are identified as underemployed can gain the skills needed to enter more economically sustainable careers and likewise how individuals with severe barriers can best be facilitated.

Upstream from the adult, potential worker pool are the K-12 and postsecondary education systems. It is likely that these systems could be improved in a way that would improve the economic performance of the state, but this paper focuses on workforce development activities after formal education.

A myriad of programs comprise the post-labor market entry workforce development system situated between the two sides of the labor market. The top oval in figure 3 lists the major programs within the public system for developing workers, and the bottom oval includes ways that the private system can develop the skills of the workforce. (The overlap includes programs in which the private sector is entrusted with public funds.) The figure places the WorkOne agencies as an intermediary between the workforce development system and the labor market. The functions of these agencies include assessment of workers and matching workers who are searching for jobs with employers searching for potential employees.

The extent to which the programs comprising the public workforce development system can be referred to as a system is debatable. Five different state agencies administer workforce development programs within the top oval of figure 3. The Department of Workforce Development administers the federally-funded job training Workforce Investment Act (WIA) programs for youth, adults, and dislocated workers as well as Trade Adjustment Assistance for workers who lose their jobs due to international trade. Approximately 14,000 individuals were

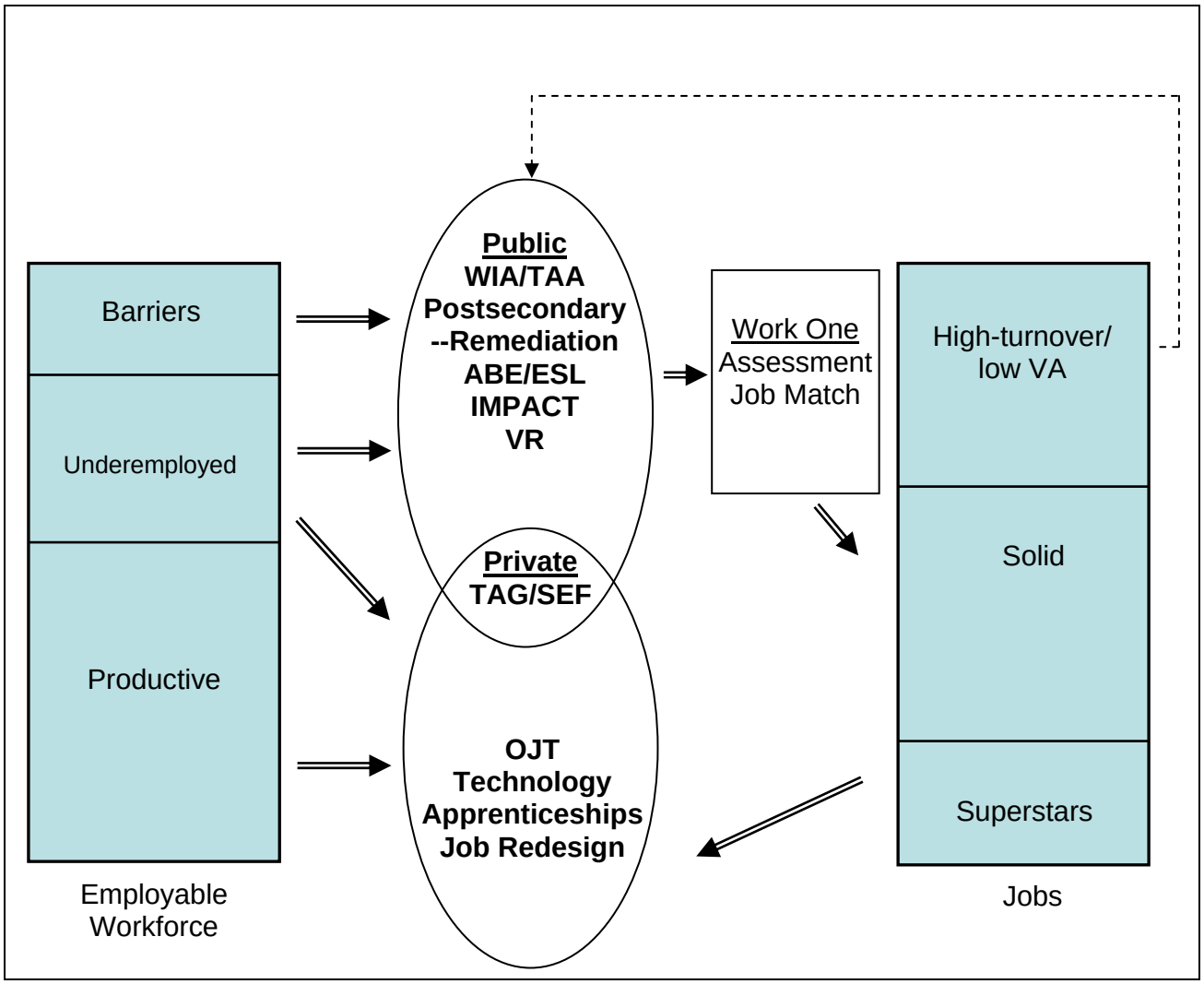

Figure 3. Workforce Development System.

served by the WIA program in 2003-2004[2] and about 4,000 individuals were assisted by TAA in Program Year 2006.[3]

The Commission for Higher Education oversees public postsecondary institutions including the Ivy Tech Community College System, which has a number of applied associate's degree programs that prepare students for careers. In figure 3, we have added remediation as a subfunction of postsecondary institutions intended to address skill barriers. It is difficult to estimate the number of individuals at Ivy Tech who would fit into the figure 3 schematic since

[2] ICCHI, "Workforce Development: An Employment and Training Compendium for Indiana."
[3] IDWD, "Raising Everyone Up One Level," 2007 Annual Training Report, p. 12.

some students may intend to transfer to baccalaureate programs. However, if we assume that most of the enrollment does fit in, there are probably 80,000 to 100,000 individuals in the postsecondary workforce development system. Assuming that 75 percent of those students require at least one remedial education class suggests that 60,000 to 75,000 of the students participate in such classes.[4]

The Department of Education administers adult basic education for those of adult age who have not received a high school diploma or GED. Relative to its population size, Indiana has a very well-developed system of adult education. Approximately 44,000 individuals participate in Indiana's adult education system in a year, which gives the state the 15th largest program in the country.[5] The Indiana Family & Social Services Administration is responsible for the IMPACT program, which is a training/employment program for individuals receiving Temporary Assistance for Needy Families (TANF) or Food Stamps. Approximately 30,000 individuals participate in these programs in a year. IFSSA also administers vocational rehabilitation programs for individuals with disabilities.[6] Approximately 32,000 individuals participate in VR programs in a year, with approximately 5,000 being rehabilitated.[7]

Finally the Indiana Economic Development Commission administers the TAG and SEF grants, which are provided to businesses for incumbent worker training and economic development purposes. These grants support the training of about 35,000 individuals.[8]

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[4] ICHHI, op. sit., documents an enrollment of about 85,000 in Perkins-funded postsecondary education. Ivy Tech estimates that 75 percent of its students take at least one remedial course, Inside Indiana Business, (http://www.insideindianabusiness.com/newsitem.asp?id=19214 accessed March 31, 2008).

[5] Office of Vocational and Adult Education, U.S. Department of Education, "Adult Education Annual Report to Congress, 2004-2005," (http://www.nrsweb.org/reports/documents/AEFLACongressionalReportFY04-05.pdf accessed March 31, 2008).

[6] ICHHI, op. sit.

[7] Indiana Commission on Rehabilitation Services, Federal Fiscal Year 2007 Annual Report, draft.

[8] ICHHI, op. sit.

Thus the size of the pool of individuals served by the public workforce development system in the state is roughly 250,000, or about 8 percent of the total labor force. Of course, many individuals productively engaged in the labor force may have gained skills through the public workforce system in prior years. Note that the WorkOne agencies serve over 400,000 individuals in a year, although there may be some double counting of individuals who may register for services two or more times.

In addition to the public "system," in the bottom oval in the center of figure 3 we have noted a number of actions that private sector employers can undertake in many circumstances in order to improve worker productivity. These include on-the-job training of incumbent workers, investment in technology, apprenticeships, and job redesign. Given that these activities have been shown to enhance productivity, it would seem to be inappropriate for the private sector to assume that workforce development is totally the responsibility of the public sector. On the other hand, because the state and its taxpayers benefit from a stronger economy, there may be an economic rationale for public subsidy of some of the activities listed in the bottom oval.

From an outsider's perspective, it appears that Indiana is in the midst of an exciting restructuring and alignment of its workforce and economic development system. Key leaders in the state are pursuing a targeted emphasis on workforce and economic development. Agencies are pilot testing innovative initiatives: for example, the 21st Century Workplace Skills Certificate, College for Working Adults, and Adult Education Works. As it pursues aligned economic growth, the state needs to adopt a rigorous research and evaluation approach, in my opinion. Priorities need to be set and programs need to be promoted based on data and results not based on beliefs, political exigencies, or anecdotes. I believe that a culture of performance monitoring and net impact evaluation/r.o.i. needs to be promoted in the state. An important step

to take in promoting such a culture is to cultivate an image of being data- and evaluation-friendly.

The performance of every program should be monitored, and administrators should use monitoring data to diagnose strengths and opportunities for improvement. Pilot programs such as those mentioned above should be encouraged, and to the extent possible, should be evaluated with random assignment. Furthermore the state should position itself to analyze the returns on investment of the workforce system programs. However, I believe that there may be some serious impediments to conducting formal r.o.i. studies now.

IMPEDIMENTS FACING AN ROI STUDY

In both Washington and Virginia, the state legislatures had enacted into statute requirements for a study of the return on investment of the state's workforce system. In both states, a particular executive agency had been tasked with conducting such a study. It is appropriate for the legislature/coordinating agency to conduct this work since the outcome is a set of investment returns that should be useful in guiding budget allocations. If particular programs have much higher returns than others, then resources should to the extent possible be re-allocated toward the program with higher returns. (Of course, eligibility requirements of and entitlements to programs may constrain such reallocations, but the principle remains that the state should allocate resources towards the programs with the highest returns.) Rigorous r.o.i. estimates require access to considerable administrative data from agencies administering the programs; and given all that agencies are expected to do, providing and supporting such data may not be a priority. Thus having legislation and a coordinating agency provides the "clout" that gets agency's attention.

Unless we are mistaken, Indiana does not have a legislated requirement to examine return on investment, and thus it has not designated a coordinating agency that could oversee and/or conduct the appropriate statistical procedures. Thus the first impediment to an r.o.i. study is that it would require considerable coordination across several agencies to simply access and construct the data sets necessary to conduct an r.o.i. study, and that coordination would have to occur absent a legislative mandate. Conducting a study now would require agreements among the various agencies to participate and to provide access to administrative and cost data. Thus the first impediment is a process concern.

A second concern is a technical one. In order to estimate the net impact of the Indiana workforce development system on individuals' economic outcomes, we need to establish a counterfactual (i.e. benchmark) set of circumstances. In prior studies, we have used the Employment Service registrants for comparison purposes. That is, the assumption is made that if a state's workforce development system did not exist, the next best alternative for individuals would be assistance through the Employment Service. That is, we compare individuals who were served by WIA or vocational rehabilitation or who were enrolled in Ivy Tech to otherwise identical individuals who registered with WorkOne, but did not participate in a public program. The employment and earnings outcome differentials between program participants and ES registrants are then attributed to the program. However, in my interviews with DWD staff, there were concerns about possible idiosyncrasies in the data since local offices had some discretion about how data were handled, and there was some concern about the representativeness of the individuals served[9]. This might translate into a bias that works against finding positive net impacts for workforce programs.

[9] DWD staff members graciously responded to a set of inquiries about WorkOne data availability. My understanding of the information that they provided is that two data bases exist. One of them, the Customer Self

IWIS IS A GREAT START

Again from an outsider's perspective, it appears as though the IWIS initiative is an excellent vehicle to move in the direction of becoming a data- and evaluation-friendly state. This data warehouse is going to have information from virtually all workers in the state, so that it will be able to support broad studies of patterns and trends. But also it is going to have administrative data from individual component programs, so that it will be able to support more pinpoint analyses that are specific to individual programs.

Virtually all employers in the state file quarterly information on the earnings of their employees. These wage records are used to compute benefits for individuals who may become unemployed and are eligible for unemployment insurance. Because of their nearly universal coverage, wage records essentially depict the entire population of jobs (as in figure 2). In the first phase of IWIS, which has been completed, the wage record data were matched with the Quarterly Census of Employment and Wages (QCEW) and New Hire Data, which importantly adds a time dimension to the framework laid out in figures 1 through 3. Future phases of IWIS are scheduled to include Department of Revenue and Bureau of Motor Vehicles data to get more accurate geo-coding and age data.

In addition to the wage record data that represents the entire state, IWIS is matching in administrative data from the individual public job development programs: CS3 data for the WorkOne agencies, education and training data from the Commission of Higher Education, adult education data from IDOE, WIA data, and IMPACT data from the FSSA. When the warehouse

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Service System (CS3), contains information that is provided by customers' self-registration. The other, TrackOne, contains information that is completed by WorkOne staff whenever customers participate in staff-assisted activities. The concern about data inconsistencies across offices referred to the CS3 system. However, when we have conducted r.o.i. studies in other states, we have always relied on other states' equivalent system to the TrackOne data base. So data inconsistencies in the CS3 system would not be that great a concern for an r.o.i. study. However, some DWD staff members intimated that in the past, some local offices may have been selective in terms of who received staff-mediated services. If there were systematic selection of clients, then an r.o.i. study that relied on those records as its counterfactual would potentially be biased.

contains these data, then it will be possible to monitor the employment and earnings outcomes for clients that have been served by these agencies.

RECOMMENDATIONS

All in all, it seems like Indiana has a strong interest in becoming a state that systematically uses data to inform and improve its workforce development system. It furthermore has begun to invest in a data system that can support performance monitoring and evaluation. The following four recommendations are intended to give the Joyce Policy Group some ideas to consider if they choose to support that general direction.

Recommendation 1: *Move toward a system approach to workforce development.* As noted above, the public workforce development programs are administered by several different state agencies. Such a decentralized approach has advantages, but also may have disadvantages. In particular, it may tend to promote "siloing" of the programs. Unless communication and coordination systems between programs have been established, there may be duplication of services. Or administrative lessons about what works for whom under what situations will not be passed on between the agencies. The ideal would be for the state to begin to refer to its workforce development system and establish some type of executive oversight entity to make sure that the agencies administering the programs are collaborating.

Recommendation 2: *Legislate or use an executive order to mandate r.o.i. studies to be used in the budgeting process.* The purpose of estimating r.o.i.'s for the various programs comprising the workforce development system is to determine whether there might be relative underinvestment in one or a few programs as indicated by relatively high returns on investment.

If there were high returns, then it would be sensible to re-allocate funding toward those programs to the extent practicable.

We would note that the r.o.i. estimates are but one data point that policy makers should rely on among many others. We are not advocating a "Tayloristic" scientific management system wherein major changes might be made based on a single measurement. Rather, we think that rigorous net impact and r.o.i. estimates should be produced and analyzed. Where returns seem relatively low, questions should be asked about how outcomes can be improved. Where returns are high, questions should be asked about how programs can be expanded, and approaches can be exported to others.

Recommendation 3: *Invest adequately in data systems.* As noted the IWIS system is a great start, but the initiative needs to continue and be funded at an adequate level. Funding needs to be adequate, and also staffing expertise needs to be available. In general, a data warehouse effort such as IWIS needs a considerable investment in time and effort for its design, but also needs a thorough plan for retaining accurate data. Data need to be appropriately "cleaned" in order to support rigorous analyses. It might make sense for the state to develop common intake forms so that individuals are providing the same information no matter where they enter the system. With common forms, then the state can develop common data error checking procedures. Furthermore, the state can design and produce performance monitoring reports that are systematic across agencies.

Recommendation 4: *Encourage program innovation.* It seems to us that each program should have at least one pilot program operating at all times so that it can improve its services. Program administrators need to follow rigorously the cycles of program improvement—setting

goals, monitoring performance, analyzing strengths and weaknesses, and trying innovations in areas that could use improvement.

In summary, staff members from the Upjohn Institute would love to conduct analyses of Indiana's workforce development programs. The state, in general, and the Joyce Policy Team, in particular, are engaged in meaningful work to align workforce and economic development initiatives. If these groups can generate the necessary agreements and authority to conduct a study now, the appendix specifies our approach to how an r.o.i. study would be done. But even if the decision is made to wait, we are confident that the state will continue on a path of reliance on administrative data and analyses for program improvement purposes. As it moves forward, we hope that the state will develop an oversight or coordinating entity that will have cross-program accountability. We believe that such a construct will facilitate meaningful use of net impact/r.o.i. studies.

APPENDIX: A GENERAL SCOPE OF WORK AND BUDGET TO CONDUCT AN R.O.I. STUDY

This appendix specifies the general scope of work and budget necessary to conduct an r.o.i. study. It assumes that eight programs would be analyzed: WIA Adults (including dislocated workers), WIA Youth, Trade Adjustment Assistance (TAA), Postsecondary Career and Technical Education, Adult Education, Vocational Rehabilitation, IMPACT for TANF clients, and IMPACT for Food Stamp recipients. It furthermore assumes that the analysis period would be SFY 2006 (July 2005 to June 2006), and that the agencies administering the programs being analyzed would make their data accessible. In particular, the Department of Workforce Development (DWD) would be key. DWD would provide data on three of the programs: WIA and TAA participants who exited from those programs (successfully or not) in 2006. It would provide the data from which the comparison groups would be drawn, i.e., WorkOne registrants who received services in 2006. And DWD would provide data on two outcomes: the wage record data that has information on earnings and employment, and UI claims data.

We would access data on Postsecondary students from the Indiana CHE, and data on adult education from the Department of Education. Finally, FSSA would provide access to data on Vocational Rehabilitation and the IMPACT programs. Furthermore, FSSA would provide data on TANF and Food Stamp benefits and Medicaid eligibility, which would be outcomes of interest.

For the participants in each of the programs, we would estimate the net impacts of program participation on the following outcomes:

- employment rates
- quarterly earnings
- receipt of UI benefits
- receipt of TANF benefits
- receipt of Food Stamps
- receipt of Medicaid benefits

Task Statements

1. The first subtask that we have to do is to match/merge earnings records from as far back as possible to the administrative data on individuals that we get from the agencies. An important component of how well a person "matches" is their labor market experience. So we need to go back as far as possible to track peoples' employment and earnings histories. This subtask will require considerable time and effort from both Upjohn Institute staff and DWD staff members.

2. Once we have merged the earnings records to the agency data, we create several summary statistics to characterize the individuals' work experiences. These variables include percent of quarters employed, earnings trend, variance in earnings, indicators of turnover, and indicators of earnings dips.

3. The third subtask will be to run logistic regressions on each of the agencies' data sets to calculate a statistic called propensity score. We need to do this for each agency, but I'll use adult education as an example. We will create a data set that combines all of the adult education exiter records with all of the WorkOne records. We run a logistic regression on this combined data set, in which the dependent variable is a dummy variable indicating that the record is an adult education record. The independent variables will include the labor market summary variables, demographic variables, and any other variables that are common in the two data sets. The propensity score, which is the predicted value of being in the adult education data set, will be written to each observation in both data sets.

4. Fourth, we will do the statistical match. This is conceptually easy. For each observation in each of the agency data sets, we will search through the entire WorkOne data set to find the observation that has the closest propensity score. (A technicality is that we will do one-to-one matching with replacement and a caliper.) After each match, we will calculate match quality statistics.

5. After we have identified the best matching comparison group for each program's data set, we will calculate the mean differences in outcome variables between the program participants and their matched comparison group. These differences constitute the net impact of the program. As tests of their robustness (believability), we will calculate regression-adjusted differences, and difference-in-differences.

6. Once we have determined the net impact on earnings, we will extrapolate the impacts into the future and we will impute fringe benefits and tax liabilities. Similarly, we will forecast transfer payment net impacts.

7. The forecasts of net earnings and transfer payments will allow us to calculate the future benefits of training. We will collect data on the per participant cost, and from these two flows, we will be able to calculate a benefit-cost ratio and rate of return.

Schedule

For purposes of this appendix, we have assumed a starting date of July 1, 2008. The work can essentially be broken down into four phases. The first subtask comprises the first phase. The schedule depends somewhat on DWD staff priorities and availability, but our best estimate is that it will take three to four weeks to complete, that is by August 1.

The second phase is comprised of the statistical calculations described in subtasks 2 through 5. It is a bit difficult to estimate a schedule because the complexity of the work may cause unexpected difficulties. On the other hand, the tasks might proceed fairly smoothly. So my best estimate is that it will take two months to accomplish these tasks, that is by October 1.

The third phase of the work is comprised of calculating the costs and benefits and r.o.i. for each of the programs. This would involve investigating the availability of per client cost data, and devising reasonable extrapolation techniques for the earnings and transfer program benefits. This phase of the work would take at least a month, i.e., by November 1.

The final phase of the work would be report writing, preparation of presentations, and documentation. These tasks would be completed by the end of the year; December 2008.

Estimated Budget

Cost Item	Hours	Cost
Staff		55,614
Hollenbeck	150	
Research Asst.	300	
Secretary	75	
Other Direct Costs		
Travel		2,000
Computing		2,000
Supplies, Telephone, Report preparation		200
TOTAL		$59,814