WORKFORCE Innovation FUND

ACCELERATED TRAINING FOR ILLINOIS MANUFACTURING

Evaluation of Accelerated Training for Illinois Manufacturing (ATIM)

Impact Report

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Abstract

The evaluation of the Accelerated Training for Illinois Manufacturing (ATIM) program was conducted by Social Policy Research Associates for the State of Illinois Department of Commerce and Economic Opportunity (DCEO) and its state partner agencies, the Illinois Community College Board and the Illinois Department of Employment Security. Between 2012 and 2016, DCEO used funding from a $12 million four-year U.S. Department of Labor Workforce Innovation Fund (WIF) grant to support the development of five regional partnerships with strong employer involvement and "demand-driven" regional training programs to prepare adults and dislocated workers eligible for Workforce Investment Act (WIA) services for employment and career advancement in advanced manufacturing jobs in machine production, welding, mechatronics, and logistics occupations. Using an accelerated career pathways approach, ATIM offered individualized assessment, career counseling, and service planning; accelerated training schedules to expedite participant readiness for job openings; and work-based training opportunities.

This report provides findings from the evaluation's impact study, which randomly assigned eligible applicants to either a treatment group (members of which were able to enroll in ATIM) or a control group (members of which could access WIA and other services in the community, but could not enroll in ATIM). Findings presented also include the results of a cost-effectiveness analysis of ATIM relative to WIA. Impact study findings confirm the positive potential of sectoral training strategies, which are encouraged under the new Workforce Innovation and Opportunity Act (WIOA). ATIM had a positive and statistically significant impact on enrollment in and completion of occupational skills training and completion of multiple (stacked) certificates for ATIM participants relative to the control group, as well as positive impacts on earnings and, in select quarters, employment, during the second year following random assignment. The cost-effectiveness analysis showed that ATIM had to spend more per participant to achieve these gains than was spent on the WIA services available to the control group, due to both ATIM being a new program with higher start-up and infrastructure costs and the fact that impacts were measured for nine to twelve months after random assignment, while costs were measured for the entire implementation period.

Keywords: accelerated training, adults, dislocated workers, demand-driven training, employer engagement, regional partnerships, advanced manufacturing, career pathways, sector strategies, randomized control trial, cost-effectiveness analysis.

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Executive Summary

In an effort to bridge the gap between the skilled workers manufacturing employers need and the low-skill status of many job seekers in Illinois, the Illinois Department of Commerce and Economic Opportunity (DCEO) and its state agency partners implemented the Accelerated Training for Illinois Manufacturing (ATIM) program. Funded by a $12 million Workforce Innovation Fund (WIF) grant from the U.S. Department of Labor, Employment and Training Administration, the ATIM program was designed to use an accelerated career pathways approach to provide workers with the skills needed for advanced manufacturing jobs. DCEO awarded Social Policy Research Associates (SPR) a contract to conduct a multi-year evaluation of the ATIM program consisting of an implementation study, an outcomes study, a random-assignment impact study, and a cost study. SPR previously reported on the implementation study findings in an interim report, published in October 2015. This final report presents findings from the outcomes study, the random-assignment impact study, and the cost study, and discusses the implications of these findings.

ATIM Program Model

Drawing on lessons learned from previous evaluations of sectoral strategies, employer partnerships, and career pathways programs, DCEO aimed to build a bridge between manufacturing employers and job seekers through ATIM. DCEO designed the program to offer training, industry-recognized credentials, and case management to participants so that they would develop the skills defined as necessary by regional manufacturing employers.

Key elements of the program, as envisioned, were as follows:

- **Contextualized Bridge Training.** To help expedite entry into further training and skilled employment, participants with basic skills gaps would have access to integrated occupational and basic skills training through contextualized bridge programs.

- **Sectoral Industry-Driven Training.** To foreground their needs and priorities, employers would have the opportunity to provide input on curriculum development, and successful completion of training would result in industry-recognized stackable credentials.

- **Accelerated Training Schedules.** To shorten the time between the onset of training and the beginning of enhanced earnings for participants and to provide employers with the workers they needed on an accelerated timeline, the occupational skills training programs would feature accelerated and flexible training schedules and encourage paid work-based learning.

- **Individualized Employment and Training Plans.** ATIM participants would develop, with the assistance of case managers, personalized training and employment plans based on in-depth assessments of academic, technical, and workplace skills and skills gaps that

would help them achieve their short-term employment goals in the shortest time possible while preparing them for long-term career advancement.

- **State-Level Participant Tracking System.** To facilitate goal-oriented case management and support performance measurement at the regional and state levels, participant information would be tracked through an online system that integrated outreach, intake, customer facilitation, and reporting.

- **Team Case Management.** To ensure involvement and buy-in from multiple stakeholders, representatives from educational institutions, the workforce system, and private industry would be included on intake and case management teams.

- **Work-Based Training Opportunities**. Participants would have work-based learning opportunities (internships, on-the-job-training, and job shadowing) as a means of gaining exposure to employment in manufacturing companies and the opportunity to earn and learn.

The evaluation's implementation study found that ATIM succeeded at providing manufacturing training connected to industry-recognized credentials. However, it also found that not all of the other elements were implemented as planned. For example, accelerated training and individualized service provision were not implemented evenly across ATIM regions, and work-based training was used less frequently than anticipated by DCEO. In addition, neither team case management involving multiple agency partners nor the use of bridge program models for individuals with limited basic skills were ultimately part of the ATIM program as it was implemented across the five participating regions.

Study Goals, Methodologies, and Data Sources

This report contains findings from the outcomes study, impact study, and cost study.

- The outcomes study examines enrollment in training, training modules completed, receipt of industry-recognized credentials, and placement in training-related employment. The data for the outcomes study come from the ATIM tracking system (for training and within-program employment activities) and the Illinois Department of Employment Security (for employment outcomes).

- The impact study uses a randomized control trial to examine differences between ATIM participants and members of the control group on a wide range of measures. For training, the impact study explores enrollment in and completion of training, as well as completion of employer-recognized credentials. For employment, the impact study compares outcomes between the two groups on rates of employment, employment retention, and earnings during each of the eight quarters following program enrollment. The evaluation team used program data from ATIM and from the WIA Adult and Dislocated Worker program (for control group members) to determine service receipt and outcomes and Unemployment Insurance (UI) wage records from the Illinois

Department of Employment Security (IDES) to learn about quarterly wages for both ATIM participants and control group members.

- The cost study details the costs of providing services and explores the costs required to achieve selected program impacts relative to the control group, using expenditure data provided by DCEO for region-level spending on both ATIM and WIA.

Study Population

The final sample for the impact study comprised 738 individuals: 514 who were assigned to the program group and thus able to enroll in ATIM and 224 who were assigned to the control group.

The two groups showed few significant differences at baseline and shared the following characteristics:

- Study participants were mostly white (72 percent). Around one-quarter were black, with smaller percentages identifying as other races.
- The average study participant was approximately 40 years old.
- Approximately 80 percent of study participants were male.
- Nearly all study participants had prior employment history, and slightly more than half noted that they had previously worked in a position related to manufacturing.

The processes used to select individuals for the study had the following impacts on the size and composition of the study population:

- Because of ATIM's selection criteria and the fairly lengthy wait time between application and random assignment, those who ultimately made it into the sample for the evaluation were highly motivated to seek out and had appropriate background to succeed in manufacturing-related employment.
- While ATIM met its goals for program enrollment, the program enrolled fewer individuals than planned in the random assignment study due to high attrition between application and random assignment and to veterans' priority of service, even after extending the length of the intake period.
- Perhaps because of the enhanced eligibility criteria and lengthy application and enrollment process, the majority of individuals in the final sample had a history of previous employment experience, had earned at least a high school diploma or GED, and did not self-report barriers to employment.

Training Outcomes and Impacts

To achieve its ultimate goal of connecting participants with employer-identified vacancies in the manufacturing sector, ATIM's design included guidance on and placement in occupational skills training. The evaluation is therefore concerned with the role that ATIM played in participants' enrollment in training, their completion of that training, and their attainment of certificates. To measure the strength of that role, the analysis presented in the report examines outcomes of ATIM participants and compares these outcomes with those of control group members, who had access to training activities funded by the Workforce Investment Act, or WIA.

All ATIM regions offered at least the Manufacturing Skill Standards Council (MSSC) Safety certificate training; three of the regions also chose to offer the three additional MSSC training modules required for the Certified Production Technician (CPT) credential: Quality Practices & Measurement, Manufacturing Processes & Production, and Maintenance Awareness. Three regions also offered the two modules required for the MSSC Certified Logistics Technician (CLT) credential, designed to raise the level of performance of material handling (logistics) workers. ATIM also connected participants with additional occupational skills training in Machining, Welding, Mechatronics[1], and Logistics/Assembly. Each training track led to one or more industry-recognized stackable and nationally portable credentials. Most regions used community colleges to deliver training, though some also offered the option to attend training offered by a for-profit training provider.

The impact analysis surfaced the following key findings about training enrollment and completion, presented graphically on the following page in Exhibits ES-1 and ES-2:

- **ATIM participants enrolled in and completed occupational skills training at significantly higher rates than members of the control group.** This finding is consistent with the results of another recent random assignment study of a program using training in high growth sectors of local economies (Hendra et al., 2016). Nearly all ATIM participants enrolled in training, and over three-quarters of ATIM participants enrolled in an occupational skills training beyond the introductory module(s) offered. By contrast, less than a quarter of control group participants enrolled in training through WIA, and this difference was statistically significant. Similarly, nearly three-quarters of ATIM participants completed at least one occupational skills training course, while less than a quarter of control group members did, and again this difference was statistically significant.

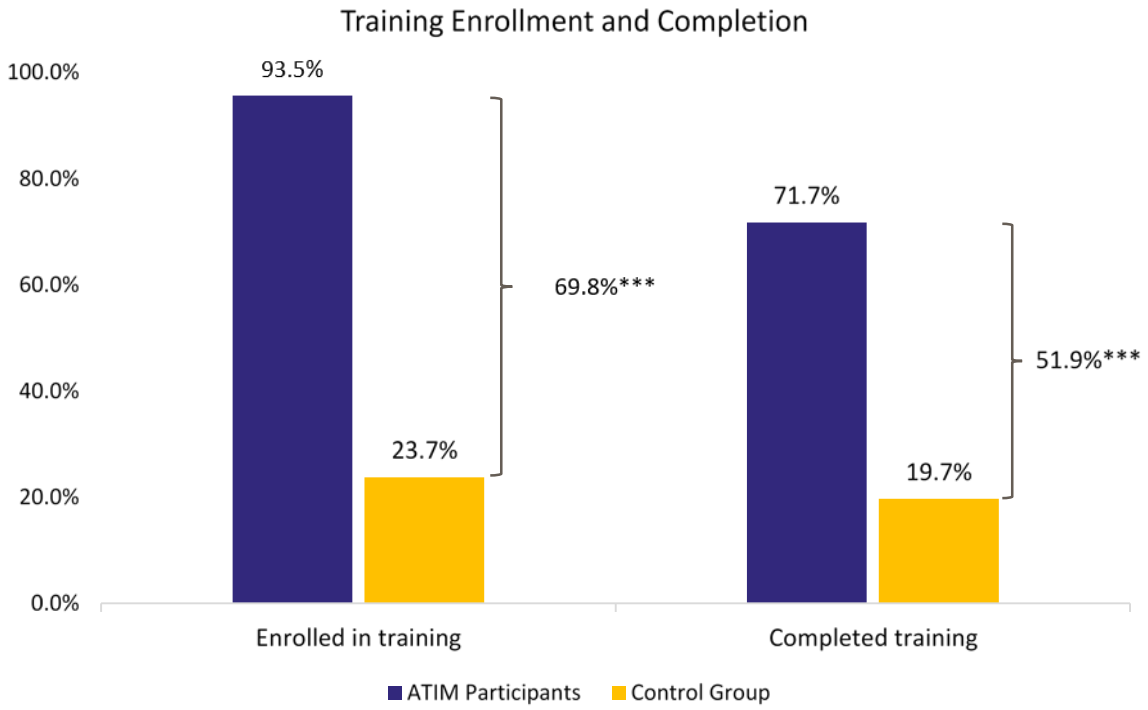
- **ATIM participants had higher rates of certificate attainment and earned more total certificates, on average, than those in the control group.** Over three-quarters of ATIM participants attained at least one certificate, compared with less than one-quarter of control group members. ATIM participants, on average, earned two more certificates

[1] Mechatronics is an emerging career area that prepares manufacturing engineers and technicians with a variety of skills (electrical, mechanical, and computer technologies) needed to design, install, maintain, modify and repair robotic machines, equipment, and component parts used in advanced manufacturing.

than control group members during the study period, indicating that ATIM participants did indeed pursue multiple stacked training programs, consistent with grant goals.

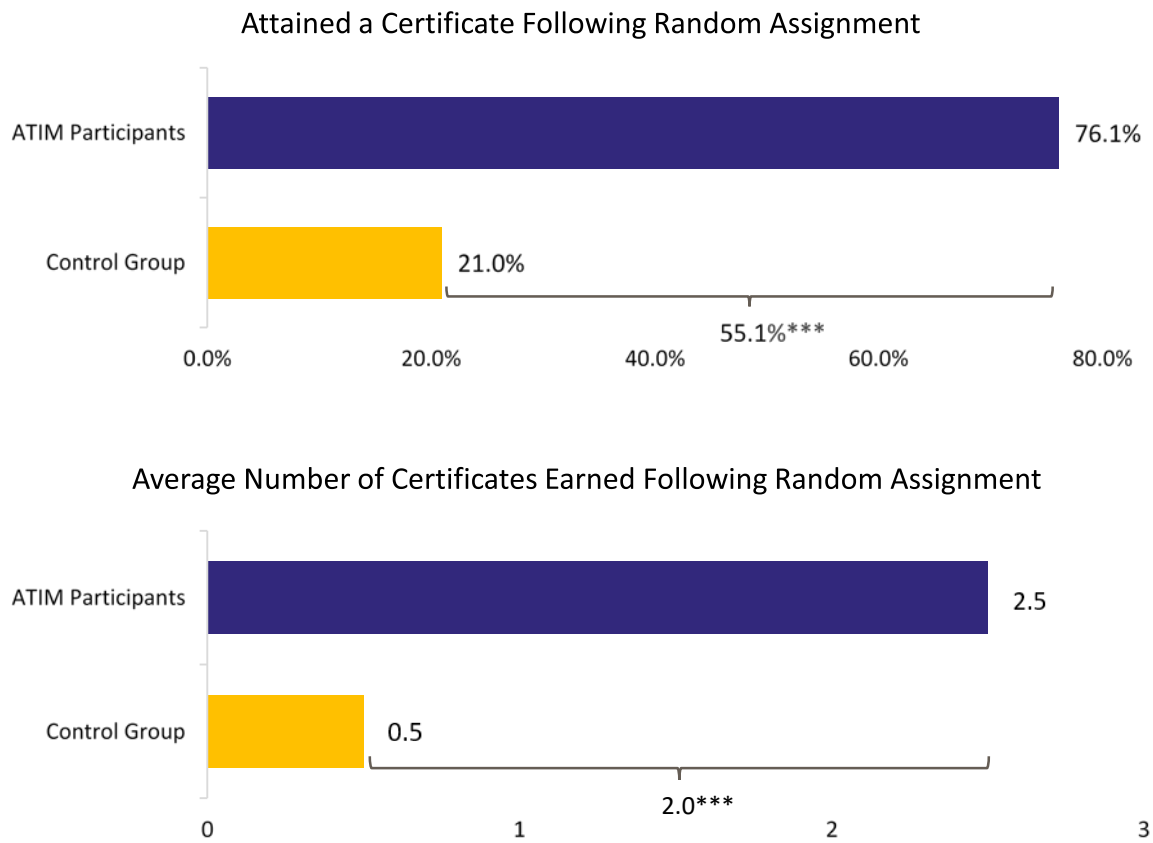
- **Although work-based training was intended to be a key program component, neither ATIM participants nor control group members engaged in this type of activity to the extent anticipated.** Employers appeared to be hesitant to offer work-based training for ATIM participants due to concerns about both their liability for hosting such trainings and the perceived bureaucracy of participating in a government-funded program to do so. The relatively small number of control group members who enrolled in WIA programs generally did not participate in work-based training either. However, ATIM participants who *did* enroll in work-based training had a high rate of completion for such training.

Exhibit ES-1: Impacts of ATIM on Enrollment in and Completion of Occupational Skills Training



Differences are significant at ***p<0.01, **p<.05, and *p<0.10.

Exhibit ES-2: Impacts of ATIM on Certificate Attainment



Differences are significant at ***p<0.01, **p<.05, and *p<0.10.

Overall, the training findings offer evidence of the value of ATIM for program participants relative to a control group offered access to WIA, though the findings do not capture training activities pursued outside of the public workforce system. The significantly higher rates of publicly-funded training enrollment for ATIM participants versus those in the control group suggest that a key benefit of ATIM participation was support and guidance in *connecting* to training. While members of the control group knew about and were eligible for WIA, they did not receive specific assistance with enrolling in WIA and accessing funding for training, and ultimately pursued and completed training at much lower rates than did ATIM participants.

Employment and Earnings Outcomes and Impacts

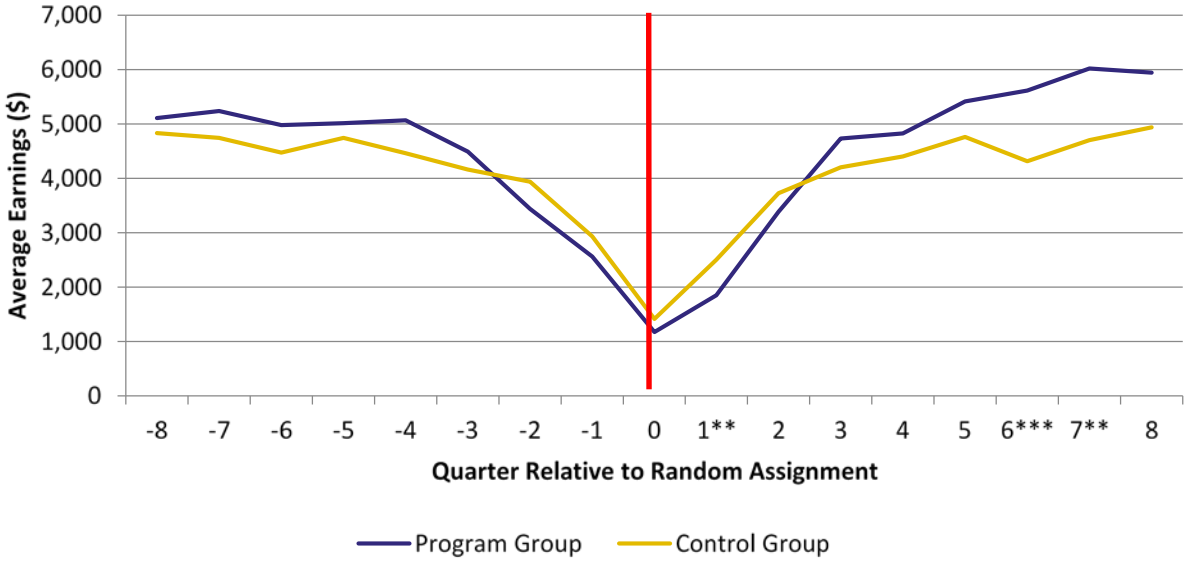
The impact analysis also measured the employment and earnings outcomes of ATIM participants and control group members and compared these outcomes to determine program impacts. The outcomes study determined that **most ATIM participants were able to find employment at the end of their time in the program**. Among all ATIM participants, 71 percent exited the program with employment, and 63 percent of these participants found training-related employment.

The impact study determined that the ATIM program also had positive earnings and employment impacts:

- **The ATIM program had positive impacts on earnings.** By the second year following random assignment, ATIM participants had higher earnings, on average, than members of the control group. These trends are depicted in Exhibit ES-3.

- **The ATIM program had some positive impacts on employment.** ATIM participants had higher employment rates than control group members in the second year following random assignment, and this difference was statistically significant for employment rates in select quarters, which are denoted in Exhibit ES-4. ATIM participants, however, did not take any less time than members of the control group to find employment on average, nor did they have a higher rate of employment retention.

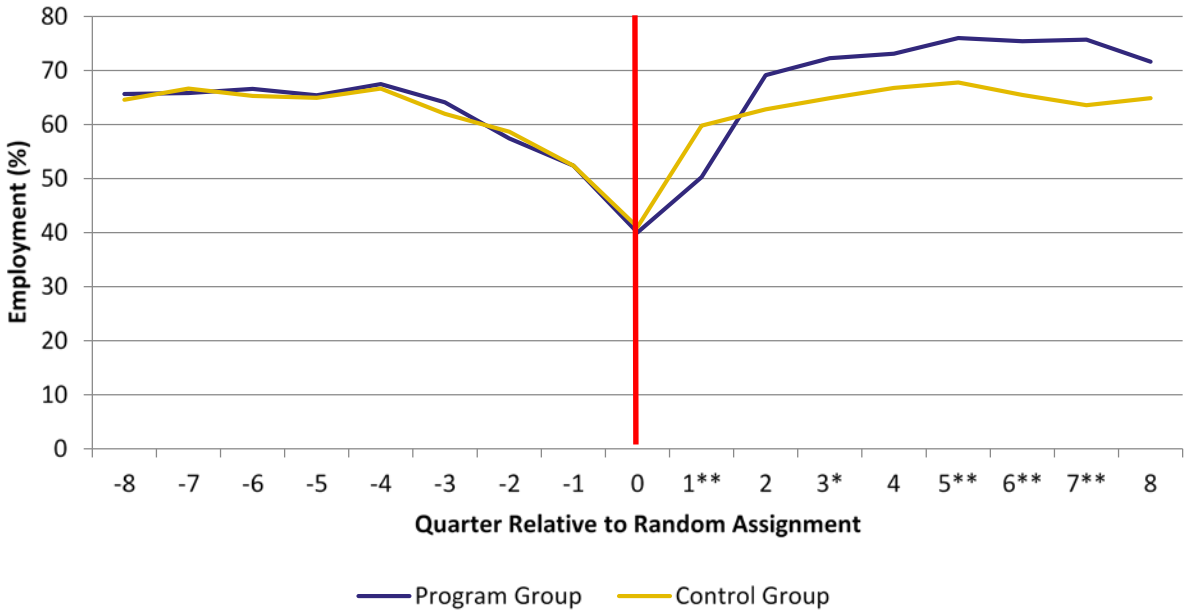
Exhibit ES-3: Trends in Earnings Before and After Random Assignment



Notes: Individuals randomly assigned during the first half of the intake period have a greater number of quarters of follow-up data than those randomly assigned during the second half of the intake period; thus, those in the latter category are not as well represented in the later quarters of follow-up data.

Differences are significant at ***p<0.01, **p<.05, and *p<0.10.

Exhibit ES-4: Trends in Employment Before and After Random Assignment



Notes: Individuals randomly assigned during the first half of the intake period have a greater number of quarters of follow-up data than those randomly assigned during the second half of the intake period; thus, those in the latter category are not as well represented in the later quarters of follow-up data.

Differences are significant at ***p<0.01, **p<.05, and *p<0.10.

These findings are consistent with existing studies of other workforce training programs, which often have delayed but long-term benefits while program participants engage in education and employment services. Furthermore, unlike what has been observed in other workforce training programs, ATIM participants achieved both employment and earnings gains relative to the control group without experiencing a long delay in entry into the labor force as would be expected for participants in a workforce training program.

Cost Study Findings

Examination of ATIM program costs (as well as how these costs related to both the impacts achieved and the costs of operating the WIA services available to the control group) revealed the following insights:

- **Across regions, spending on training for participants represented the main use of grant funds.** Training costs accounted for roughly half of grant spending for most regions (and over 80 percent in one region), consistent with the program's emphasis on connection to occupational skills training.

- **Costs per participant varied across regions, driven by the intensity of service uptake for ATIM participants rather than by enrollment levels alone.** Regions with higher rates

of training enrollment needed to spend more on both staffing and training, yielding higher costs per participant.

- **The average per-participant cost for ATIM was significantly higher than the per-participant cost for the WIA Adult and Dislocated Worker programs during the grant period.** The average per-participant cost for ATIM was $9,991, which is over three times the average per-participant cost under WIA for regions during the program implementation period.

- **Although ATIM participants enjoyed higher earnings and higher rates of employment, the program had to spend high amounts to achieve these gains.** Overall, ATIM spent approximately $1,900 for every additional week an ATIM participant was employed relative to a member of the control group. Additionally, ATIM spent approximately $1.36 to achieve a $1 increase in earnings for an ATIM participant relative to a member of the control group.

While the ATIM program had to spend more per participant to achieve employment and earnings gains than was spent on the WIA services available to the control group, this conclusion must be interpreted within a broader context. One reason the ATIM program had higher marginal costs compared to WIA is that the evaluation period examined outcomes for a relatively short period during and immediately following ATIM program implementation, but assigned all the costs of program planning, development, and implementation to the cost of serving the ATIM participants during this same period. Some of these expenditures—such as the development and implementation of new partnerships; the creation of an online system to handle applications, joint case management, individualized training & employment plans, and dashboards to track services and outcomes; and the development of contracts with and programs for training providers—can be thought of as investments in developing the longer-term capacity of the public workforce and education system to support sectoral initiatives. For example, the online system designed for ATIM is now being used to support the state's implementation of the U.S. Department of Agriculture's Employment Opportunities, Personalized Services, Individualized Training and Career Planning Initiative (EPIC). There is also the potential for adapting the joint case management functions to allow cross-program teams of WIOA partner staff to jointly manage services provided to co-enrolled individuals. Additionally, while this analysis does not include a cost-benefit approach, it is worth noting that access to accelerated training programs, relative to what would have been available in the absence of ATIM, may reduce the amount of public benefits, including unemployment insurance, accessed by ATIM participants relative to the control group. This short-term assessment of ATIM's costs and how they relate to program outcomes may therefore overestimate the ongoing marginal costs of the ATIM program for participants and underestimate the long-term gains accruing to program participants. A longer-term assessment of program costs and impacts may have yielded somewhat different conclusions about the ATIM program's cost effectiveness.

Implications of Evaluation Findings

Findings from the ATIM evaluation support the potential of sectoral training strategies, which are a key element of the new Workforce Innovation and Opportunity Act (WIOA). The results of this evaluation, however, may not be generalizable to the universe of all potential participants of sectoral training programs. Both ATIM participants and members of the control group generally had a history of previous employment experience, had earned at least a high school diploma or equivalent, and did not self-report significant barriers to employment. Slightly more than half of the members of the study group noted that they had previously worked in a position related to manufacturing. In addition, the study population reported relatively short spells of unemployment before entering the ATIM program—approximately half of the participants had earnings during the quarter prior to random assignment. Because a significant number of those individuals in the broader population who might seek employment training—both in Illinois and elsewhere—have more limited educational and work experiences, the study findings may not be generalizable to all WIOA participants.

However, these limits to the generalizability of program results do not undermine the finding that the ATIM model was effective for the individuals who completed the extended assessment and intake process—who tended to be individuals with recent employment experience and transferrable skills, given that assessments administered included those for manufacturing aptitude. Moreover, the effectiveness of the model was robust enough to show positive impacts on employment even though ATIM was initiated at a time when the manufacturing sector was going through an economic downturn.

Chapter I: Introduction

Across the United States, manufacturing employers have identified the industry's skills gap as a considerable problem, reporting that their inability to find and hire employees with relevant manufacturing training and experience hampers the growth of the sector (Muro et al., 2015). At the same time, job seekers with low skills struggle to find employment with earnings high enough to support self-sufficiency (Maguire et al., 2009). In the past, such job seekers sometimes overlooked the manufacturing sector because of its reputation for low job security and dangerous or repetitive work (President's Council of Advisors on Science and Technology, 2012). However, advanced manufacturing, a growing and innovative part of the sector, offers new opportunities and higher earnings for those with the appropriate skills.

In an effort to bridge the gap between the skilled workers that manufacturing employers need and the low-skill status of many job seekers in Illinois, the Illinois Department of Commerce and Economic Opportunity (DCEO) and its state agency partners implemented the Accelerated Training for Illinois Manufacturing (ATIM) program. Funded by a $12 million Workforce Innovation Fund (WIF) grant from the U.S. Department of Labor, Employment and Training Administration, the ATIM program was designed to use an accelerated career pathways approach to provide workers with the skills needed for advanced manufacturing jobs. DCEO distributed slightly more than half of the total grant amount among five regional consortia, and used the remaining funds to involve state-level partners, provide technical assistance and oversight to the regions, develop and maintain information systems to document program activities and outcomes, and fund a required third-party evaluation. DCEO awarded Social Policy Research Associates (SPR) a contract to conduct a multi-year evaluation of the ATIM program consisting of an implementation study, an outcomes study, a random-assignment impact study, and a cost study. SPR previously reported on the implementation study findings in an interim report, published in October 2015. This final report presents findings from the outcomes study, the random-assignment impact study, and the cost study, and discusses the implications of the findings.

ATIM as a Hybrid of Three Employment and Training Models

When designing ATIM, DCEO drew on aspects of three employment and training models: sectoral strategies, employer partnership programs, and career pathways models.

- Sectoral strategies involve workforce development professionals, educational providers, employers, and job seekers collaborating to create workforce development interventions that target in-demand industries and occupations in a given area, thus helping job seekers achieve employment with upward mobility while increasing local economic development (Hendra et al., 2016).

- Employer partnership program models foster direct connections between local employers and public workforce development and education programs. The model depends on the assumption that involving employers in developing the design and

content of a training program will result in those employers being more satisfied with the skills of the workers seeking employment (Duke et al., 2006).

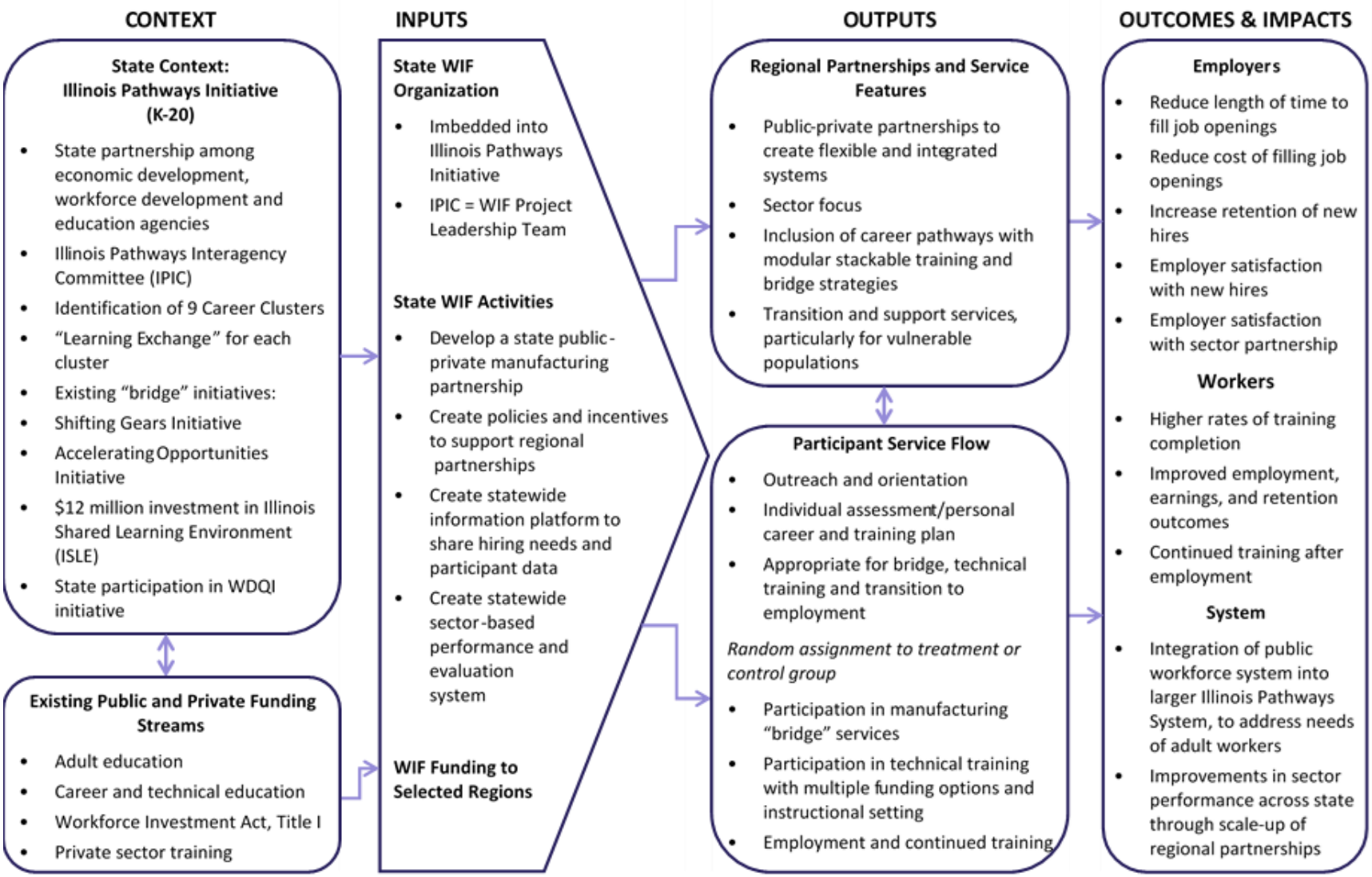
- Career pathways models create discrete steps to guide participants on paths from entry-level employment to further educational opportunities and higher-earning employment in their desired fields, with each step designed to help the participants achieve clearly defined competencies. Training programs that are aligned with career pathways models help students to learn industry-defined competencies and earn industry-recognized credentials (Fein, 2010).

For more specific guidance on program design, DCEO considered a number of lessons that had been learned from evaluations of programs based on these models. Most notably, ATIM built on findings from the Sectoral Employment Impact Study, which found positive employment impacts for programs that prepared participants for expanding sectors of their regional economies (Maguire et al., 2009), and the evaluation of Integrated Basic Education and Skills Training (I-BEST), a career pathways program that found positive educational impacts, such as increased credential and credit attainment (Zeidenberg et al., 2010). At the time that ATIM was conceptualized, few other impact evaluations of programs based on sectoral strategies, employer partnerships, or career pathways models had been completed. In the interim, however, studies have accumulated further evidence on the effectiveness of these interventions as well as additional information about what factors help and hinder their success. Details from these new studies provide important context for situating the outcomes and impacts observed under the ATIM program.

Promising new evidence about sector strategies comes from a recent random-assignment evaluation of WorkAdvance; it found positive employment impacts at three of the four sites where the program was implemented, two of which focused on manufacturing (Hendra et al., 2016). Similarly, a quasi-experimental evaluation of three Ohio workforce sector partnership programs funded by the National Fund for Workforce Solutions found positive employment impacts for the programs, though few participants in the programs focused on advanced manufacturing or construction achieved jobs in those specific industries (Michaelides et al., 2014). Since all three programs achieved positive employment impacts even if the jobs were not in the target sector, the authors believe that industry-focused training for low-skill workers "can be an effective tool for promoting their overall employment even when it does not lead to substantial impacts on employment in the program's focus industry" (Michaelides et al., 2014, p. 53). In addition to assisting Illinois in making decisions about future sector strategies, employer partnerships, and career pathways programs, then, this evaluation also adds to the growing body of research described above. Specifically, this evaluation offers more details about programs focused on manufacturing since ATIM targeted that sector exclusively.

As shown in the logic model illustrated in Exhibit I-1, ATIM aimed to build a bridge between manufacturing employers and job-seekers by offering training, industry recognized credentials, and case management to participants so that they could develop the skills defined as necessary by regional manufacturing employers. In the planned model, employers and local educational institutions were expected to be key partners in developing job-seeker competency standards and curriculum.

Exhibit I-1: Conceptual Framework for Evaluation



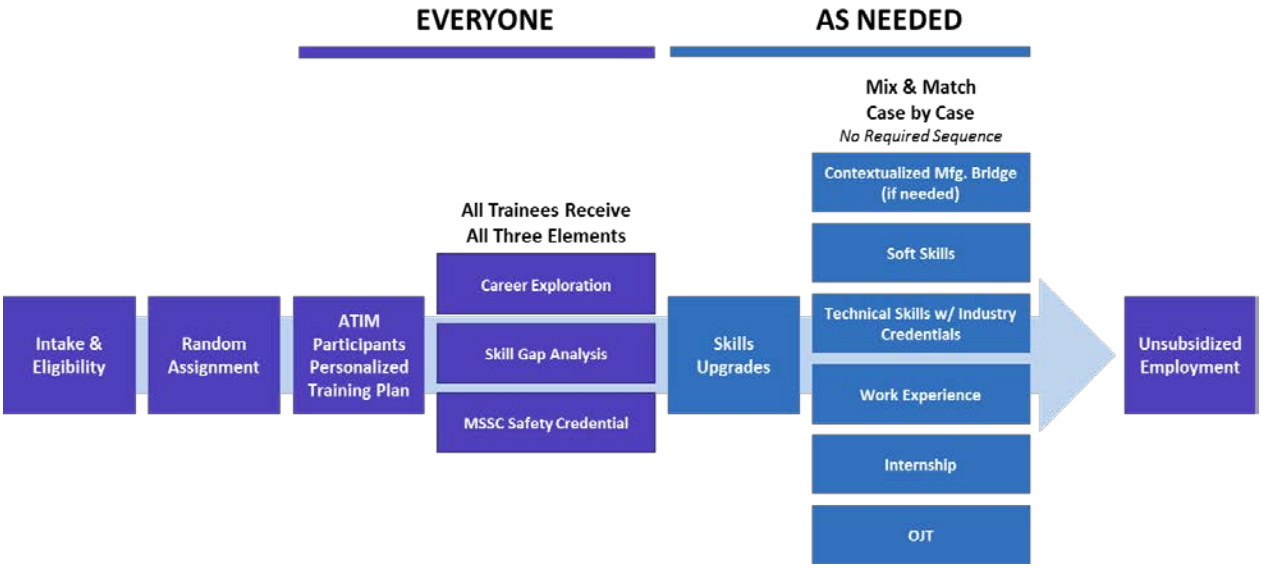
The ATIM Program Model

Key elements of the program, as envisioned, were as follows:

- **Contextualized Basic Skills Training.** To help expedite entry into further training and skilled employment, participants with basic skills gaps would have access to integrated occupational and basic skills training.
- **Sectoral Industry-Driven Training.** To foreground their needs and priorities, employers would have the opportunity to provide feedback on curriculum development, and successful completion of training would result in industry-recognized stackable credentials.
- **Accelerated Training Schedules.** To shorten the time between the onset of training and the beginning of enhanced earnings for participants and to provide employers with the workers they needed on an accelerated timeline, the occupational skills training programs would feature accelerated and flexible training schedules.
- **Individualized Employment/Training Plans.** ATIM participants would develop, with the assistance of case managers, personalized training and employment plans based on in-depth assessments of academic, technical, and workplace skills that would help them achieve their short-term employment goals in the shortest time possible while preparing them for long-term career advancement.
- **State-Level Participant Tracking System**. To facilitate goal-oriented case management and support performance measurement at the regional and state levels, participant information would be tracked through a system that integrated outreach, intake, customer facilitation, and reporting.
- **Case Management Teams.** To ensure involvement and buy-in from multiple stakeholders, representatives from educational institutions, the workforce system, and private industry would be included on intake and case management teams.
- **Work-Based Training Opportunities.** Participants would have work-based learning opportunities (internships, on-the-job-training, and job shadowing) as a means of gaining exposure to employment in manufacturing companies.

Exhibit I-2 on the following page illustrates the state's vision for efficient delivery of these participant services within the five participating regions. However, as described later in this chapter, not all of these elements were implemented as planned.

Exhibit I-2: ATIM Vision for Service Flow



ATIM Implementation Timeline

The award of the federal Workforce Innovation Fund grant to Illinois was announced in July 2012. Following a period during which DOL and the WIF national evaluation coordinator reviewed the ATIM model with the state, the RFP for regional proposals was released in March 2013, and the five regions were selected for grant participation in late May 2013. Regions began providing services to ATIM participants in October of 2013. All ATIM-funded training was completed by August of 2015, and follow-up services were available to ATIM participants through the end of 2015.

Lessons from ATIM's Implementation

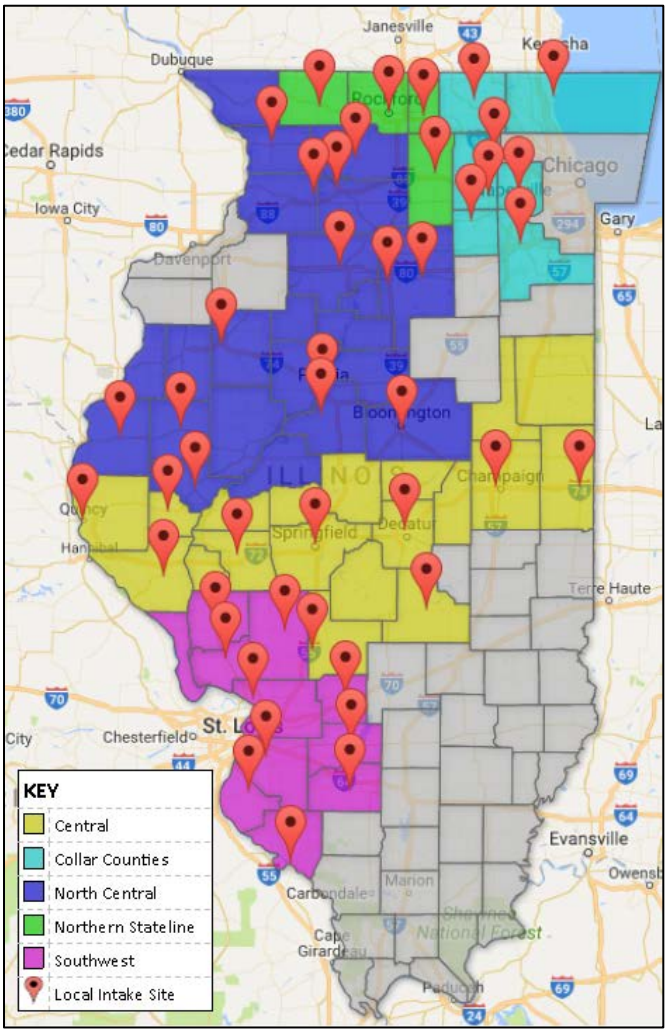
SPR produced an implementation study report (Betesh et al., 2015) that discusses the many facets of ATIM implementation in full detail. Key implementation findings from that report are described below.

Importance of Regional Context

Regional context mattered: participants in the more rural regions experienced ATIM differently than those in the more suburban ones. The ATIM program was implemented across five regions. Despite being in the same state, these regions have very different labor markets, populations, and socio-cultural contexts. Exhibit I-3 includes a map of the ATIM regions, along with local intake sites within each, and details on the geography and composition of regions appear below.

- The **Central Region** comprised six local workforce areas encompassing 19 counties in Central Illinois, including the key population centers of Springfield, Champaign, Decatur, and Quincy.
- The **Collar Counties Region** comprised five local workforce areas encompassing six counties surrounding Cook County in the greater Chicago region.
- The **North Central Region** comprised three local workforce areas and part of a fourth local workforce area, encompassing 22 counties in the central and northwest parts of the state. The region is mainly rural, with some small cities such as Peoria, Bloomington, and Galesburg.
- The **Northern Stateline Region** comprised one local workforce area and part of a second encompassing four counties in Northern Illinois, near the Wisconsin border. The key population center in the area is the small city of Rockford.
- The **Southwest Region** comprised two local workforce areas and part of a third, encompassing 11 counties along the Mississippi river, near the state's southern border with St. Louis, Missouri.

Exhibit I-3: Map of the ATIM Regions and Local Intake Sites



As shown in the map, the five regions participating in ATIM covered large geographic areas of the state, including a total of 62 of Illinois' 102 counties. The population densities of the five regions range considerably, with Collar Counties and Southwest consisting of relatively dense suburban communities and the other regions encompassing combinations of very rural counties and counties with towns and small cities. The number of manufacturing opportunities also varies greatly across, and even within, the regions. According to labor market data from Bureau of Labor Statistics, 32 of ATIM's 62 counties had zero private manufacturing employment positions during the study period, while DuPage county alone, near Chicago in Collar Counties, had over 37,000 private manufacturing employment positions in 2015.[2] In general, the more rural areas had fewer manufacturing employers.

Prior studies evaluating the provision of similar programs in rural areas emphasize the added challenges associated with this geographic context. For example, there may be fewer jobs than

[2] Quarterly Census of Employment and Wages http://www.bls.gov/cew/datatoc.htm. These statistics include only private employment.

in urban areas, and training and employment opportunities can require significant travel (Meckstroth et al., 2008). Such barriers became apparent under ATIM. Some regions, like Central and North Central, include many counties, so a manufacturing employment center or training opportunity in one area of the region could be quite far away for some participants in the region. Transportation and commuting distance became a concern for this reason. Such variation led to diverse experiences for participants within ATIM even though the program was guided by one overall model across the state.

Fluctuations in the Manufacturing Economy

Declines in the manufacturing and advanced manufacturing economies between grant application and program launch affected program implementation. While ATIM staff members reported that manufacturing employers in their areas were excited to participate in ATIM when they first heard about it during the proposal and planning phase in 2013, some had trouble meeting their initial commitments as they struggled with lower demand once the program was underway. Manufacturing and advanced manufacturing labor market information from the Quarterly Census of Employment and Wages (QCEW) from 2010 to 2015 confirms that the sector was in a growth period in 2013, when ATIM regions wrote their proposals. However, the sector then experienced a decline in 2014 when program activity picked up. While the sector grew again in 2015, the decline in 2014 occurred when many ATIM programs were trying to engage employers to participate in the program. The expectation was that employers would (1) help with recruitment and assessing the potential of applicants and (2) be involved in case management, in addition to providing work experiences and later hiring participants. The fact that manufacturing employers were dealing with a declining sector, at least in 2014, was likely one reason that their involvement in ATIM was more limited than expected. For example, work-based training opportunities such as internships and on-the-job training were implemented less frequently than planned. In addition to its effect on the program model, the fact that the manufacturing sector was in a state of retraction may have affected the hiring of both ATIM participants and control group members. The single-sector focus of ATIM left the program vulnerable to decline and fluctuation in that sector. Evaluations of similar programs have identified this inherent challenge of sector strategies as an issue of concern (Michaelides et al., 2014).

Role of Applicant Review Process in Program Attrition

ATIM had a lengthy and intensive applicant review process that led to significant attrition between application submission and random assignment. Some ATIM staff members indicated that employers appreciated having participants go through such a stringent process since it likely increased the quality of their future job candidates. Research on other sector strategy programs has also identified a thorough applicant review process as an important component of the model (Hendra et al., 2016). However, because this process took so long and so many applicants dropped out before enrolling, there were fewer total ATIM participants than planned. While more urban regions with larger populations, like Collar Counties, had pools of applicants deep enough to choose from even with this intensive and lengthy review process,

the more rural areas struggled to find enough qualified participants, reducing the total sample size for the impact study.

Less Robust Case Management Model than Desired

Case management for ATIM participants involved fewer stakeholders than planned. The initial plan for ATIM was team-based case management with high levels of involvement from employers and educational institutions. As described above, however, employers had less interest in this part of ATIM than hoped, in part because their attention turned to dealing with economic fluctuations in their own sector. Similarly, educational institutions were less connected to case management and ATIM participant tracking than desired. While local educational institutions provided classes for ATIM participants, most did not otherwise play significant roles in the ATIM program. Because the Local Workforce Investment Areas (LWIAs) ended up providing the bulk of the case management to ATIM participants, these services were often similar to what was available through the Workforce Investment Act (WIA) Adult and Dislocated Worker programs. The relatively limited funding for ATIM case management, and the fact that many ATIM case managers also maintained WIA caseloads, likely increased the tendency for ATIM case managers to fall back on typical WIA case management practices. (While this finding could indicate a more limited service differential than initially intended between ATIM participants and control group members who accessed WIA case management services, as discussed in more detail in the next chapter, most control group members did not ultimately enroll in WIA).

Lack of Bridge Training

Although all regions had planned to offer bridge training to participants, no region actually implemented any traditional bridge training for the ATIM program. There were several reasons for this divergence from the original program model:

- Initial ATIM eligibility requirements called for reading and math proficiency to be at the 6th-grade level, but once implementation began, in order to ensure that applicants would be able to succeed in occupational skills training in the time allowed, the state encouraged regions to prioritize enrollment for those who had reading scores at or above a tenth-grade level and math scores at or above a ninth-grade level. This approach greatly reduced the number of individuals who would normally be considered appropriate for entry into a bridge program.
- ATIM regions perceived the ATIM program timeframe to be insufficient for both bridge and ATIM occupational training.
- Several ATIM regions lacked an existing bridge program appropriate for ATIM participants, and often the community colleges did not have the infrastructure to provide such training.

Success Providing Advanced Manufacturing Training

All five regions successfully connected participants to manufacturing training that was generally aligned with initial project plans and connected to industry-recognized credentials. The ATIM grant stimulated development of new or improved manufacturing training programs, increased student demand for existing programs, and convinced education and training providers to offer training in new formats (e.g. accelerated timetables). In some regions, ATIM also enabled training providers to rapidly develop new or improved curricula or programs.

Variation Across Regions in Ability to Accelerate Training

Some colleges successfully implemented accelerated training, but not all of them did. One barrier to offering accelerated training was the fact that at least some of the participating colleges were committed to the semester system and were unable to implement more flexible course scheduling for ATIM participants. Because of this, ATIM participants attending those schools had to complete their training on a fairly typical timeline and did not have access to open entry/open exit training models that would have permitted them to complete training in a shorter period of time than traditional training programs. Progress in implementing accelerated training did occur in Collar Counties, where proprietary training institutions were more flexible than the community college training providers and in the Central Region, where some community colleges were able to offer training to ATIM participants using an open entry/open exit schedule.

Connecting ATIM to Key Aspects of the WIOA Legislation

The growing evidence about sectoral strategies, employer partnerships, and career pathways that guided the design of the ATIM program model has also begun to shift national and Illinois workforce development policy. The federal Workforce Innovation and Opportunity Act (WIOA), which was signed into law in July 2014, requires states and local areas to demonstrate efforts in developing industry or sector partnerships and career pathways (Wilson & DeRenzis, 2015). In its WIOA Unified State Plan for 2016-2020, Illinois places strong emphasis on these requirements. For example, it lays out a plan for adopting a “demand driven orientation” that supports “the systemic assessment of business needs for talent across local, regional and state levels and ensure[s] that strong partnerships with business drive decision-making across the talent pipeline” (State of Illinois Workforce Innovation and Opportunity Act Unified State Plan for Program Years 2016-2020, p. 31). It also describes a plan for creating “career pathways to jobs of today and tomorrow” which is expected to be driven and designed in partnership with Illinois businesses (State of Illinois Workforce Innovation and Opportunity Act Unified State Plan for Program Years 2016-2020, p.31). Because ATIM anticipated the importance of these strategies, the findings described in this report can be used in the development and refinement of Illinois’ new sector partnerships and career pathways.

As described in this chapter and summarized in Exhibit I-4 on the following page, the planned ATIM model included program features that had been identified in prior research studies as having positive effects on participant employment and earnings. While not all of these planned

features were fully implemented as intended, they anticipated many of the key themes of the WIOA legislation. Thus, Illinois' experience with the ATIM initiative provides useful information to guide the state's design for WIOA—both in determining the feasibility of implementing key WIOA program priorities and in anticipating the impacts of key program features on customer outcomes.

Exhibit I-4: Fidelity to Features of the ATIM Program Model and Relevance to WIOA

Key Features of ATIM Model	Extent to Which Feature was Implemented	Correlated Features of WIOA Legislation
1. **Contextualized Basic Skills Training.** Use of bridge model with integrated basic and occupational skills for those with limited basic skills.	Not realized, because training timeline did not allow for completion of both bridge training and occupational skills training.	Encourages use of evidence-based bridge models (e.g., I-BEST).
2. **Sectoral Industry-driven Training.** Inclusion of employer input and preparation for nationally recognized credentials for basic manufacturing skills and specific occupational skills.	Consistently implemented across regions.	Encourages sectoral initiatives and use of industry-recognized credentials promoting mobility along career pathways.
3. **Accelerated Training Schedules.** Encourage development of stackable accelerated training options to meet the hiring needs of regional employers.	Some regions were more successful than others in arranging accelerated training schedules.	Encourages use of stackable credentials to allow individuals to enter and leave training for career pathway at multiple entry and exit points.
4. **Individualized Employment/ Training Plans.** Individualized services based on detailed analysis of transferrable skills and skill gaps.	Consistently implemented across regions.	Encourages design of services to match customer needs rather than a required sequence of services.
5. **State-level Participant Tracking System.** To facilitate goal-oriented case management and support performance measurement at the regional and state levels, participant information is tracked through a unified system maintained at the state level.	Consistently implemented across regions.	Uniform performance measures across multiple programs.
6. **Case Management Teams.** Case management by workforce staff, training providers, and employers in making decisions about which applicants to consider and overseeing participant progress once enrolled.	Not realized, due to decision that individual case records could not be shared with employers, and lack of interest by training providers and employers in sharing case management of ATIM participants.	Calls for stronger alignment among workforce development programs and between workforce development and education and training systems.
7. **Use of Work-based Training.** Creation of opportunities for job shadowing, internships, and OJT and partnering with staffing agencies.	Limited participation, in part due to employer hesitation to implement such opportunities.	Encourages use of work-based training and "earn and learn" models.

Overview of the Evaluation

The evaluation uses a random assignment design to assess the impacts of ATIM (as well as the costs needed to achieve these impacts), assuming a counterfactual of work-based and occupational skills training funded through WIA. ATIM's design, which as described above anticipated key features of the WIOA legislation, aimed to promote innovation in public workforce system services by integrating findings from prior research on employment and training programs. Since control group members were eligible for WIA, aware that the program could provide funding for training, and had usually completed the ATIM orientation, application and eligibility determination process at a local American Job Center where WIA services were offered, WIA represents the most likely and convenient option for control group members who sought assistance connecting to training. WIA services therefore constitute an appropriate counterfactual because in the absence of the WIF grant, the LWIAs implementing the program would have simply offered the WIA services available to the control group. Chapter II describes the random assignment process and control group members' access to WIA in more detail.

The evaluation includes four key tasks: an implementation study, an outcomes study, an impact study, and a cost study. SPR's interim report (Betesh et al., 2015) presented findings from the implementation study based on two rounds of site visits to participating regions, a stakeholder survey that assessed partnerships, and telephone interviews of local employers that assessed their project engagement and hiring needs.

This report contains findings from the outcomes study, impact study, and cost study.

- The outcomes study examines several outcomes for ATIM participants: enrollment in training, training modules completed, receipt of industry-recognized credentials, and placement in training-related employment.

- The impact study uses a random-assignment design to examine differences between ATIM participants and members of the control group on a wide range of measures. For training, the impact study explores enrollment in and completion of training, as well as completion of employer-recognized credentials. For employment, the impact study compares outcomes between the two groups on rates of employment, employment retention, and earnings during each of the eight quarters following random assignment.

- The cost study describes the costs of operating the ATIM program, compares these costs with those required to deliver the WIA services available to the control group, and analyzes the relationship between the costs of the program and the differences in outcomes between ATIM participants and the control group.

Evaluation Research Questions

Several key research questions guided each element of the evaluation presented in this report. These research questions appear below, with those pertaining to program impacts noted as either confirmatory or exploratory.

The research questions for the **outcomes study** address ATIM participants' connection to training and employment:

- What percentage of ATIM participants enrolled in training offered by the ATIM program?
- What percentage completed at least one training module?
- What percentage received at least one employer/industry recognized credential or certificate?
- What percentage entered a job related to training?

The **impact analysis** asks questions about the effect of participating in the ATIM program compared to the outcomes that would have occurred in the absence of the program:

- How did ATIM participation affect enrollment in and completion of occupational skills training funded through the public workforce system? (Confirmatory)
- How did ATIM participation affect employment outcomes, such as obtaining and retaining employment, and average quarterly earnings? (Confirmatory)
- Did any of the estimated ATIM impacts differ for key subgroups, such as those differentiated by prior employment history and highest level of educational attainment? (Exploratory)

The **cost study** explores the costs of providing services and how these costs relate to selected program outcomes:

- What did the ATIM program cost to operate and how did these costs relate to program outcomes? (Confirmatory)
- To what extent did regions leverage additional funding, other than the WIF grant, to cover the costs of ATIM program operation? (Exploratory)
- How cost-effective was ATIM as compared with WIA Adult and Dislocated Worker programming, which was the main alternative available for members of the control group? (Exploratory)

Evaluation Data Sources

The evaluation team used three data sources to conduct the program evaluation. Details on the content, extraction and use of each source appear below, and the relationship between these sources and key outcomes appear in Exhibit I-5.

- **ATIM Tracking System**: This system, maintained by the Illinois workNet data team, housed all study participants' application data, and served as a system for tracking ATIM participants' service uptake, credential attainment, and exit information. Illinois workNet maintained an SPR study ID within this system drawn from SPR's random assignment system, and for the impact analysis, Illinois workNet provided SPR with a file containing these records for all individuals with an SPR study ID.

- **Illinois Workforce Development System (IWDS) Tracking System**: The IWDS tracking system pulled from the ATIM tracking system as well as IWDS' own records on WIA participation to provide data on service uptake, training enrollment, training completion, credential attainment, and employment outcomes for both ATIM participants and members of the control group who enrolled in WIA.[3] The impact analysis is limited to examining training funded through the public workforce system, and therefore assumes that individuals who do not appear in these training records did not access such training. It is possible that some individuals may have enrolled in such training in another state, but given the focus of the program on Illinois specifically, reliance on IWDS data was deemed most appropriate. IWDS also maintained an SPR study ID within this system drawn from the SPR random assignment system, which enabled IWDS to pull data for all individuals with an SPR study ID.

- **Unemployment Insurance (UI) wage data**: Records from the Illinois Department of Employment Security (IDES) provide quarterly wages for both the program and control groups. The research team also used this data source to determine employment status, assuming zero earnings for a given quarter meant that an individual was not employed. It is possible that an individual with zero earnings might have been employed in another state or in the informal sector, but given the focus of the program on manufacturing employment within the state of Illinois, reliance on IDES UI wage data was deemed the most appropriate mechanism for capturing employment outcomes. To obtain these data, the research team provided IDES with a file containing key identifiers (first name, last name, date of birth and Social Security Number) for all sample members, and IDES provided a matched file containing quarterly employment and earnings data beginning with the first quarter of 2011 (or 10 quarters prior to the beginning of ATIM) through the latest quarter in which wage data were available (first quarter of 2016, which represents three quarters after all training under ATIM was completed). Within this period, nearly half of the study sample (48 percent) had at least eight quarters of wage data after random assignment, another 48 percent of the sample had between four and eight quarters of wage data after random assignment, and only the remaining 4 percent of the sample had three quarters of wage data after random assignment. For comparability across years, the wage information was converted to the 2015 dollar-equivalent.

[3] IWDS was used to capture data on training enrollment (funded through ATIM for ATIM participants and through WIA for control group members) and completion. While institution-level data could have separately been obtained through the Illinois Community College Board, the IWDS data was used instead because it covers a broader range of training options, including private training providers and short-term non-credit trainings.

Exhibit I-5: Key Outcomes Measures, by Data Source

Outcome Measure	Data Source for Treatment Group Members	Data Source for Control Group Members
Training Enrollment and Completion		
Enrolled in at least one training course	ATIM Tracking System and IWDS Tracking System	IWDS Tracking System
Completed at least one training course	ATIM Tracking System and IWDS Tracking System	IWDS Tracking System
Educational Attainment		
Completed at least one credential or certificate	ATIM Tracking System and IWDS Tracking System	IWDS Tracking System
Number of credentials or certificates completed	ATIM Tracking System and IWDS Tracking System	IWDS Tracking System
Employment and Earnings		
Time between study entry and first quarter of employment	IDES UI Data	IDES UI Data
Employment during the first, second, third, fourth, fifth, sixth, and seventh quarters after entry in study	IDES UI Data	IDES UI Data
Earnings during the first, second, third, fourth, fifth, sixth, and seventh quarters after entry in the study	IDES UI Data	IDES UI Data
Stability of employment over fifth, sixth, and seventh quarters after entry in the study (Number of quarters employed during three-quarter period)	IDES UI Data	IDES UI Data

Analytic Approach for the Outcome and Impact Studies

This report presents impacts estimated using regression analysis. While random assignment ensured that ATIM participants and the control group were similar, and impacts can therefore be estimated using simple *t*-tests to assess whether differences in outcomes between the program and control group are statistically significant, regression analysis was used both due to very small differences between program and control group members in two baseline characteristics and because it adds explanatory power since the inclusion of covariates allows for the control of observable characteristics, explaining greater variance in the data and improving estimation precision.

Additional analyses were conducted using a hierarchical linear modeling (HLM) approach. HLM further accounts for the nested nature of the data. Under this approach, individuals were nested within regions to account for region-level variation that may influence outcomes, potentially further refining estimation. Results from the HLM analyses are included in Appendix C of this report. All five regions aimed to enroll 70 percent of applicants to the program group and 30 percent to the control group, with varying degrees of fidelity. To account for the non-equal probability of being selected into the program group, the data analysis utilized weighting.

Additionally, because the analysis relied on administrative data that were not subject to issues of non-response bias, post-stratification weights were not applied.

The research team was interested in assessing impacts on a number of potential outcomes. As a result, the evaluation carried out a large number of comparisons between the program and control groups. Multiple comparisons, however, may elicit increased probability of Type I errors—or detecting a significant program effect when it does not exist. A method for addressing this multiple comparisons issue is to make the thresholds for determining statistical significance more stringent. However, this reduces statistical power and therefore increases the potential for type II errors (or failing to detect a significant program effect when it does exist). To address these limitations, this study utilizes the recommended approach for such situations: treat the key outcomes as confirmatory and the remaining outcomes, including the subgroup analyses, as exploratory (Schochet, 2008). The research questions identified above therefore note outcomes of interest as either confirmatory or exploratory. For the key confirmatory outcomes, which include those for employment and earnings, we also make minimal adjustments to correct for multiple comparisons. These corrections for multiple comparisons are reported in Appendix C.

The analyses on the full analytic sample were replicated for key subgroups of interest to explore whether the program differentially affects individuals from different subgroups. Key subgroups are described in more detail in the next chapter. The subgroup analysis is treated as exploratory because of the small analytical sample and concern about multiple comparisons.

Analytic Approach for the Cost Study

The cost study describes how grant funding (including additional leveraged funds) was allocated and details the aggregate, system-level cost of operating the ATIM program. The cost study estimates overall costs of program implementation and also breaks down costs by individual program element (e.g., personnel, training, supportive services, supplies, and vendor contracts) and by region. These estimated costs are also used, in conjunction with the results of the impact study, to inform a cost-effectiveness analysis of the ATIM program compared to WIA services (the services available to the control group members). This approach yields an estimate of the amount spent per average percentage increase in employment and earnings among ATIM participants. The cost-effectiveness analysis also compares the differences in employment and earnings outcomes and costs between the ATIM and control groups to assess marginal costs between these groups. These results are reported in Chapter V.

Overview of the Report

Rather than presenting the findings from the outcomes and impact studies in separate chapters, this report takes a more integrated approach, discussing in sequence the study population, findings on the training received, and findings on employment and earnings outcomes. It then presents findings on program costs. The report concludes by summarizing the key findings and providing a synthesis of their relevance and possible future application.

Specifically, the remaining chapters present the evaluation findings as follows:

- **Chapter 2** describes the study population, discusses the aspects of the ATIM program and evaluation (eligibility criteria, recruitment, and enrollment process) that determined the study population's composition, and identifies key subgroups of interest for the impact analysis.
- **Chapter 3** presents findings on training outcomes and impacts.
- **Chapter 4** presents findings on employment and earnings outcomes and impacts.
- **Chapter 5** provides an analysis of program costs and summarizes results from the cost effectiveness analysis.
- **Chapter 6** reviews key findings, summarizes notable accomplishments, describes challenges, and presents a set of lessons learned that can be applied to WIOA implementation or other future programs utilizing sector strategies and/or career pathways.

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Chapter II: Study Population

To fully understand the evaluation's findings on participant outcomes and program impacts, it is important to have detailed knowledge of the study population from which data were obtained—that is, ATIM participants and the members of the control group. To provide this knowledge, this chapter describes ATIM's recruitment and intake processes—which helped determine the composition of participants in the final sample—and then outlines the characteristics of study participants, including those in the subgroups of interest for the impact analysis.

Key Findings

- **ATIM's rigorous and lengthy applicant assessment process filtered out all but the most qualified and motivated applicants.** Because of ATIM's selection criteria and the fairly long wait time between application and random assignment, those who ultimately made it into the sample for the evaluation were highly motivated to seek out and had appropriate background to succeed in manufacturing-related employment.
- **The final sample is smaller than planned.** Given high drop-off rates between application and random assignment, as well as the delayed start of random assignment and exclusion of some applicants from randomization due to veterans' priority of service, ATIM enrolled fewer individuals in the evaluation than expected, even after extending the length of the intake period.
- **ATIM participants and the control group are, on the whole, similar, indicating that random assignment worked as intended.** Likely as a result of the length and intensity of the applicant review process, the majority of individuals in both groups had a history of previous employment experience, had earned at least a high school diploma or GED, and did not self-report many barriers to employment, which limits the generalizability of the study findings to more disadvantaged populations.

Program Recruitment and Study Enrollment

Understanding who the program targeted and how they came to enroll in the impact study is important for interpreting the results presented in this report, as the program's targeting and eligibility criteria affected the composition of the final sample. The state had a strong interest in ATIM being employer-driven, and hoped to provide employers with job-ready candidates who possessed the required skills and experience to succeed in the workplace after completing the

program. To ensure appropriate candidate selection, then, in its initial grant plan, the state indicated that ATIM would be open to those who

- were eligible for Workforce Investment Act (WIA) Adult and/or Dislocated Worker programs,
- scored at or above a sixth-grade level on basic assessments of reading and math skills,
- were English-proficient,
- passed a drug screening test.[4]

These original criteria were based on an assumption that regions would be able to offer remedial ("bridge") programming to help those with limited basic skills prepare for occupational skills training. However, once implementation began and it became apparent that bridge programming would not be feasible to offer within the grant timeline, the state encouraged regions to prioritize enrollment for those who, in addition to satisfying the original set of criteria,

- had reading scores at or above a tenth-grade level and math scores at or above a ninth-grade level, based on the recommendation of the Illinois Manufacturers' Association,
- had interest in and ability to complete manufacturing-related training based on completing the National Occupational Competency Testing Institute (NOCTI) assessment, and
- consented to undergo a background check (though background check results, in and of themselves, did not disqualify applicants from participating in the program)

Exhibit II-1 on the following page shows the steps to enrollment in the study. Both the state and the individual regions selected for participation conducted a variety of outreach methods to inform potential participants and employers about the program. Recruitment efforts included e-mail blasts to Unemployment Insurance recipients, newspaper ads and radio spots, flyers, newspaper articles and television interviews by local media, and links to state and regional websites and social media describing the program. Outreach messages invited interested individuals to complete an online application and to attend a face-to-face orientation session scheduled at a large number of local sites in the participating regions. At the local orientation session, interested participants were given more information about the services available through ATIM and were informed that participation in ATIM would be determined through random assignment.[5] If assigned to the program group, they would be able to participate in

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[4] Paying for a drug screening test as part of the ATIM intake process was viewed as a way to make ATIM program graduates more attractive to regional employers, as well as to reduce employers' hiring costs, since most employers required drug screening as part of their own hiring procedures.

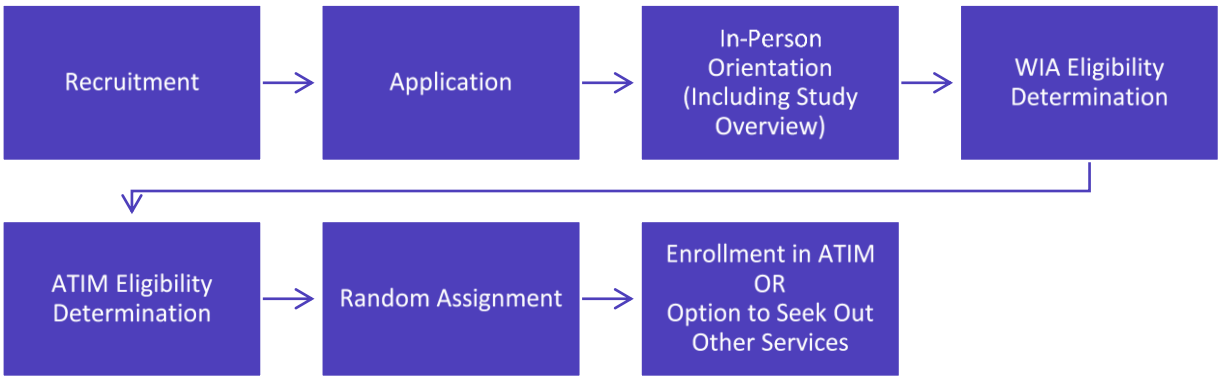
[5] Veterans (95 of whom enrolled in the program) were exempt from random assignment due to the federal requirement for priority of service to qualifying veterans and their spouses, which reduced the number of individuals in the study.

ATIM; if assigned to the control group, they would be able to enroll in alternative services in the community, including WIA[6], but not in ATIM.

Individuals who were still interested in participating after attending the orientation session were encouraged to complete the online application, if they had not already done so, and were asked to signed a consent form agreeing to participate in the study. The next steps were screening for WIA eligibility, then determining ATIM eligibility and fit through basic skills assessments, aptitude and interest assessments, interviews, and a drug test.

ATIM staff then used SPR's web-based random assignment system to assign individuals to either be in the program group (and therefore have the opportunity to participate in ATIM) or become a member of the control group. Individuals assigned to the program group were enrolled in ATIM, while control group members were informed that they could not enroll in ATIM but could still access other programs in the community such as WIA (though the state and the evaluation team specifically advised regions not to automatically enroll control group members in WIA). The study team regularly monitored output from the web-based random assignment system and cross-checked study forms to ensure that control group members did not attempt to enroll in ATIM.

Exhibit II-1: Study Enrollment Flow



The outreach and recruitment criteria and enrollment processes described above influenced the characteristics of the individuals who ultimately enrolled in the impact study in several ways. First, as a result of implementing the more refined criteria in outreach and recruitment, the pool of screened applicants largely comprised individuals who were already motivated to seek out (and in possession of the necessary background to succeed in) manufacturing-related

[6] WIA was replaced by the Workforce Innovation and Opportunity Act (WIOA) on July 1, 2015, but according to state officials, WIOA was not fully implemented in Illinois' local workforce areas until well after the end of the ATIM intake period. This report therefore refers to WIA—that is, WIA Adult and/or Dislocated Worker programming—when describing services available to control group members.

employment. Second, recruitment of unemployment insurance recipients through e-mail blasts, which proved to be one of the most effective recruitment strategies, had the effect of attracting a population with a relatively recent history of (and potentially fewer barriers to) employment (see the ATIM implementation study [Betesh et al., 2015] for information on the success of this recruitment mechanism).

Finally, the length of the process for determining eligibility and appropriateness for ATIM affected the composition of the final group of applicants who went through random assignment. Completion of all of the steps pictured on the previous page—from application through learning the results of random assignment—took anywhere from three to six weeks. Given all of these steps and the time needed to complete them, only 17 percent of those who initially completed applications ultimately went through random assignment. The final sample therefore includes only those individuals who were able to stay engaged—and support themselves—through the entire length of this process.

In this context, it is interesting to note that while ATIM orientation and eligibility determination took place at local American Job Centers which offered WIA, by staff who often worked on both ATIM and WIA, only 30 percent of control group members ultimately enrolled in WIA after random assignment, despite being eligible for and aware of that program, and despite already being engaged in the workforce development system through their ATIM application. While some of this pattern can be explained by the fact that ATIM staff were advised not to directly connect control group members to WIA, another potential explanation why most control group members did not enroll in WIA is that once control group members had waited through the lengthy process leading up to random assignment, they were eager to get back into the workforce and not interested in pursuing another program that required a separate application process. Estimates of the impact of the ATIM program may thus be higher than they might have been if timeline between application and random assignment had been shorter, particularly given recent evidence of the WIA program's effectiveness (McConnell et al., 2016). More detail on the WIA services available to the control group and how those compare with what ATIM participants received can be found in Chapter III, as a background to discussing relevant impacts.

Sample Composition

The final sample for the impact study comprised 738 individuals: 514 who were assigned to the program group and thus able to enroll in ATIM and 224 who were assigned to the control group.[7] Across participating regions, each individual eligible for random assignment had a 70-percent chance of being assigned to the program group and a 30-percent chance of being assigned to the control group—a ratio set to balance the desire to maximize access to services with the need to create a sufficiently large control group. Random assignment was originally

[7] A total of 745 individuals went through random assignment, but seven individuals were removed from the final sample: one who did not have consent forms on file, one who was ultimately ineligible for the program, two who requested to be dropped from the study, and three who were veterans who were randomly assigned in error.

scheduled to last from July of 2013 to March of 2014, but due to start-up delays, random assignment did not begin in earnest until October of 2013. Then, because some regions struggled to enroll sufficient numbers of participants, the random assignment period was extended through July of 2015. All ATIM participants had to complete training by August of 2015[8] to allow for at least nine months following the completion of training to observe employment outcomes.

Initially, based on an estimate of being able to serve 600 total individuals with the available funding from the WIF grant, the target for the total number of study participants was set at 857 (600 ATIM participants would require a control group of 257 individuals at the 70/30 ratio). Each region was apportioned a certain percentage of the overall target to create the regional enrollment targets shown in Exhibit II-2. Most regions ended up close to or even slightly above their targets, with the exception of the Southwest region, which experienced start-up and implementation challenges[9] and failed to reach its target (see Exhibit II-1). Due to the low enrollment in the Southwest region, the final sample is smaller than expected, which, as discussed in the previous chapter, limits the extent to which the impact analysis can detect effects and explore differences in impacts for key subgroups.

Exhibit II-2: Target Versus Actual Numbers of Study Participants, by Region

Region	Total		ATIM Participants		Control Group	
	Target	Final	Target	Final	Target	Final
Central	125	132	88	90	38	42
Collar Counties	253	297	177	204	76	93
North Central	130	113	91	88	39	25
Northern Stateline	190	172	133	112	57	60
Southwest	159	24	111	20	48	4
Total	**857**	**738**	**600**	**514**	**257**	**224**

Source: SPR random assignment system

As expected given the random assignment design, ATIM participants and those in the control group have very similar characteristics on average. Using data on demographics and background from the ATIM application form, and wage data on quarterly employment and earnings, Exhibit II-3 shows key characteristics of ATIM participants and members of the control group as reported at the time of program application, prior to random assignment. Among all of

[8] Because of this requirement to complete training by August of 2015, individuals who enrolled at the very end of intake were limited in their training choices to programs of five weeks or less. However, it is important to note that the total number of individuals on whom this training constraint was imposed was quite small. Despite the extension of the intake period, ATIM did not ultimately enroll many more individuals during the extra time allotted and only three program group members were subject to this constraint.

[9] The evaluation's implementation study report (Betesh et al., 2015) provides more detail on the implementation challenges faced in this region.

these background and previous employment characteristics, only two (those identifying as Hispanic and the percentage of individuals who self-reported on the ATIM application that they had any prior work experience) showed slight statistically significant differences between ATIM participants and the control group. In both cases, these differences are very small. Additionally, administrative data used to measure prior employment history—presented as employment in the quarter prior to random assignment as measured through UI wage data—shows no differences between groups. Otherwise, the two groups show no significant differences at baseline.

The following key characteristics describe the sample population as a whole.

- Study participants were mostly white (72 percent). Around one-quarter were black, with smaller percentages identifying as other races.[10]
- The average study participant was approximately 40 years old.
- Approximately 11 percent of study participants (of any race) identified as Hispanic.
- Approximately 80 percent of study participants were male.
- The most commonly reported barrier to employment was having a criminal record (35 percent of the individuals in the sample reported a prior misdemeanor and/or felony conviction). Other barriers, such as homelessness, limited English proficiency, and having a disability, were not widely reported.
- Slightly fewer than half of study participants had not pursued post-secondary education (credential, certificate, or degree) at the time of application.
- Nearly all study participants had prior employment history, and slightly more than half noted that they had previously worked in a position related to manufacturing.
- Approximately half of study participants had worked during the quarter prior to random assignment (according to wage records from the Illinois Department of Employment Security).

[10] Approximately two percent of participants indicated on their applications that they identified as more than one race. These individuals are double-counted in the numbers above.

Exhibit II-3: Characteristics of ATIM Participants and Control Group Members at Time of Application

Characteristics	ATIM Participants	Control Group	Difference
Demographic Characteristics			
Gender			
Female	19.8%	22.0%	-2.1
Male	80.2%	78.0%	2.1
Race and Ethnicity[11]			
White	71.6%	73.9%	-2.3
Black	26.1%	26.0%	0.1
Hispanic	9.7%	14.1%	-4.4*
Asian	2.5%	1.4%	1.0
Age (average)	40.4	40.0	0.4
Barriers to Employment			
Disability	3.8%	3.8%	0.0
Criminal Record	34.9%	35.0%	-0.1
Limited English Proficiency	1.8%	3.8%	-2.1
Homelessness	3.2%	3.9%	-0.7
Drug or Alcohol Dependency	2.8%	3.4%	-0.6
Highest Educational Attainment			
Some high school, no credential	2.0%	3.5%	-1.5
High school diploma or equivalent	42.5%	39.4%	3.1
Trade certificate or credential	2.0%	3.6%	-1.6
Some college	28.3%	26.0%	2.3
Associate's degree	12.4%	11.9%	0.5
Bachelor's degree	10.7%	13.1%	-2.4
Master's degree or higher	2.2%	2.5%	-0.4
Employment History			
Ever employed	99.1%	100.0%	-0.9**
Previous manufacturing-related employment	56.3%	53.6%	2.7
Employed in the quarter prior to RA	52.4%	52.4%	0.0
Wages in the quarter prior to RA	$2,559.89	$2,931.53	-$371.64

Source: ATIM applications and Illinois Department of Employment Security
Notes: Estimates were weighted to equalize the odds of selection into the groups. Differences are significant at ***p<0.01, **p<.05, and *p<0.10.

[11] Percentages of those identifying as American Indian/Alaska Native or Hawaiian Native/Pacific Islander are suppressed due to small cell sizes.

Key Subgroups

The impact analyses presented in this report cover both the full analytic sample and, for employment impacts[12], subgroups that either draw on implementation study findings and/or offer policy-relevant insights for readers of this report interested in implementing similar programming. Subgroups examined in this report, summarized on the following page in Exhibit II-4, include:

- **Timing of Enrollment.** As described earlier in the chapter, some regions were slower to begin random assignment in earnest, in part due to challenges with starting up and implementing the ATIM program. Because recent relevant evidence on the effectiveness of sectoral training program points to a relationship between program maturity and participant outcomes (Hendra et al., 2016), one of the subgroups examined in this report, designed to capture both early and more mature program implementation, is whether someone enrolled early (on or before the median date of random assignment for that region) or late (after the median date of random assignment for that region). Additionally, running subgroup analyses based on timing of enrollment provides the opportunity to see whether impacts change based on the length of time elapsed since random assignment.

- **Prior Manufacturing Employment Experience.** ATIM was designed to respond to employers' need for employees who had the training and relevant experience to succeed in the manufacturing sector. To account for such training and experience obtained prior to ATIM, the analysis presented in this report accounts for whether individuals had prior manufacturing employment experience (as reported on their ATIM applications).

- **Educational Attainment.** Similarly, because ATIM was designed to respond to employers' need for a skilled workforce, and because the implementation study found that ATIM could not feasibly integrate remedial skills education into the program model in the available time, the analysis presented in this report considers two groups for prior educational attainment: those with a high school diploma or less, and those with education beyond a high school diploma.

[12] As detailed in the next chapter, very few control group members enrolled in WIA-funded training, rendering it impractical to run subgroup analyses for this topic.

Exhibit II-4: Subgroup Composition, by Study Group

Subgroup	ATIM Participants	Control Group
Timing of Enrollment		
Early RA	270	103
Late RA	244	121
Prior Manufacturing Experience		
No Prior Experience	225	104
Prior Experience	289	120
Education		
HS or less	227	98
More than HS	287	126
Overall	514	224

Source: Illinois Workforce Development System (IWDS) database

The results of the subgroup analyses should be interpreted with caution. Random assignment relies on the law of large numbers to create equivalent program and control groups, and as the sample size increases, likelihood of group equivalence also increases (Strube, 1991). Program and control group equivalence for a given set of measures may not extend to the subgroup analyses, as the size of the analytic sample is reduced.

Implications for the Analysis

The characteristics of the study sample, as described above, influence the impact study in two key ways:

- **The impact study can only detect larger differences between ATIM participants and the control group, and cannot assess region-level impacts**. While the final sample size ultimately did not compromise the minimum detectable effects estimated during the study's initial design, the sample size does mean that while the impact study can identify impacts of the ATIM program relative to other services available in the local community, only larger differences can be detected (as discussed in Chapter IV, the program shows positive impacts on some key employment outcomes, but not others). Additionally, because of (expected) variations in sample size across regions, the report does not analyze program effects by region. (Descriptive tables showing key outcomes by region appear in Appendix B.) It should be noted that region-level impacts would not have been possible to calculate even with the expected enrollment levels, and the evaluation was therefore not designed to measure region-level impacts. Because of the small numbers of participants overall, any subgroups defined by specific program characteristics will rely on broad categories of program services, rather than individual programmatic components.

- **The relatively high skill levels and employability of individuals in the sample limit the generalizability of the study results.** The majority of individuals in the final sample—as a result of the extended and intensive screening—had a history of previous and recent employment experience, had earned at least a high school diploma or GED, and did not self-report many barriers to employment (with the exception of prior misdemeanor or felony offenses). Training completion and employment outcomes can therefore be expected to be relatively strong overall. These sample characteristics will also limit the study's ability to generalize findings from the ATIM net impact study to programs targeting individuals with lower levels of educational or employment experience or specific employment barriers.

Chapter III: Impacts of ATIM on Enrollment in and Completion of Training

To achieve its ultimate goal of connecting participants with employer-identified vacancies in the manufacturing sector, ATIM's design included guidance on and placement in occupational skills training. The evaluation is therefore concerned with the role that ATIM played in participants' enrollment in training, their completion of that training, and their attainment of certificates. To measure the strength of that role, the analysis presented in this chapter examines outcomes of ATIM participants and compares these outcomes with those of control group members, who had access to training activities funded by the Workforce Investment Act, or WIA.

Key Findings

- **ATIM participants enrolled in and completed occupational skills training at significantly higher rates than members of the control group.** Nearly all ATIM participants enrolled in training, while only a quarter of control group participants enrolled in training through WIA, and this difference was statistically significant. Similarly, nearly three-quarters of ATIM participants completed at least one occupational skills training course, while less than a quarter of control group members did, and again this difference was statistically significant.
- **ATIM participants had higher rates of certificate attainment and earned more total certificates, on average, than those in the control group.** Over three-quarters of ATIM participants attained at least one certificate during the study period, compared with less than a quarter of control group members, and on average ATIM participants also earned more total certificates than control group members.
- **Although work-based training was intended to be a key program component, most ATIM participants did not engage in this type of activity.** Employers were hesitant to offer work-based training for ATIM participants, and ultimately participants did not participate in job shadowing and participated in on-the-job training and internships at very low rates. The small number of control group members who enrolled in WIA programs generally did not participate in work-based training either.

Training Activities Available to ATIM Participants

A key feature of the ATIM model was connecting participants with occupational skills training in advanced manufacturing. All ATIM regions offered at least the Manufacturing Skill Standards

Council (MSSC) Introduction to Manufacturing and Safety training; three of the regions also chose to offer additional MSSC training modules from the four-module Certified Production Technician (CPT) curriculum: Quality Practices & Measurement, Manufacturing Processes & Production, and Maintenance Awareness.

ATIM also connected participants with additional occupational skills training in Machining, Welding, Mechatronics[13], and Logistics and Assembly. Each training track led to one or more industry-recognized credentials:

- Machining training, which included Computer Numerically Controlled (CNC) machining, prepared participants for various National Institute for Metalworking Skills (NIMS) certificates, such as machining and metalforming, as well as machining-specific certificates in milling, turning, and precision machining.
- Welding training provided through ATIM prepared participants for various American Welding Society (AWS) certificates and related OSHA credentials.
- Mechatronics training provided through ATIM prepared participants for the Industrial Maintenance Certificate and the Mechanical Maintenance Certificate.
- Logistics and Assembly training provided through ATIM prepared participants for the NIMS Measurement, Materials and Safety credential and the MSSC Certified Logistics Technician (CLT) certification.

Most regions used community colleges to deliver training, though some also offered the option to attend training offered by a for-profit training provider. Overall, slightly more than half (56 percent) of participants who enrolled in a training program did so at a community college. Private training provider enrollment levels were highest in Northern Stateline (69 percent) and Collar Counties (58 percent), where private training providers were more plentiful and key partners in the grant. Other regions also had small numbers (less than 10 percent) of participants enroll in a private training program.

The ATIM model, as originally envisioned in the state's proposal to DOL, called for work-based training and job placement assistance as key program activities, in addition to the occupational skills training activities described above. Work-based training programs envisioned as part of this approach included early worksite exposure (such as through job shadowing), internships and other work experience opportunities, and on-the-job training (OJT), to be completed in conjunction with classroom training or simply as a standalone service depending on participants' background and prior skills. However, as described in the implementation study report (Betesh et al., 2015), work-based training opportunities did not materialize as frequently as planned, largely because employers were reluctant to participate. For example, job shadowing did not occur as part of the program, as firms were hesitant to invite untrained individuals into the workplace due to safety concerns and because such visits would disrupt the

[13] Mechatronics is an emerging career area that prepares manufacturing engineers and technicians with a variety of skills (electrical, mechanical, and computer technologies) needed to design, install, maintain, modify and repair robotic machines, equipment, and component parts used in advanced manufacturing.

regular operations of the facility. Employers did offer facility tours, as well as (limited) internships and OJT, as these options allowed employers to "try out" an ATIM participant in the workplace with little risk and do so at a lowered cost—given that the ATIM program paid for the stipend or part of the wages during a specified timeframe for these job-training opportunities.

Services Available to Control Group Members

Control group members were able to enroll in and apply for training funding through WIA, which may have enabled them to access both OJT opportunities and Individual Training Accounts (ITAs) to fund training programs in demand occupations, including manufacturing-related training, depending on the availability of funds in their local workforce areas. As noted in the ATIM implementation study report, the cap on training funding available through ITAs was actually higher than the per-participant training funding amount for ATIM[14], and WIA-funded training also offered access to resources unavailable to ATIM enrollees, such as a two-week work readiness training in the Collar Counties region and the National Career Readiness Certificate (NCRC). Additionally, as noted in the introduction, the implementation study also found that case management practices for ATIM ultimately were of a similar level of intensity to WIA case management in most regions. However, the implementation study also identified several benefits of ATIM training relative to WIA: access to accelerated baseline certificates such as the MSSC safety module, and potential to pursue multiple stackable credentials beyond an initial training. (As will be discussed later in the chapter, it is important to note that control group members could also have enrolled in self-funded training programs that would not be captured in the WIA service data used for this analysis).

Training Outcomes for ATIM Participants

Three training outcomes are relevant for assessing the success of ATIM: the percentage of participants who enrolled in the various forms of training offered, the percentage of training enrollees who completed each form of training (and received a certificate), and the length of time it took those who enrolled to complete their training. Another important outcome, given the program's design, is the number of certificates received. These outcomes varied for the three categories of training offered under ATIM—the MSSC modules, additional occupational skills training, and work-based training.

As shown on the following page in Exhibit III-1, 438 individuals (85 percent of total ATIM participants) enrolled in the MSSC Introduction to Manufacturing and Safety module, and of those enrolled, nearly three-quarters successfully completed the training (including receiving the relevant certificate). Smaller numbers of participants chose to enroll in additional MSSC

[14] While ITAs may have been available in larger amounts than per-participant training allocations for ATIM, if and when local workforce areas exhausted their training funding for the year, WIA participants could have been placed on a waiting list until more funds were available. A recent national evaluation of the WIA Adult and Dislocated Worker program conducted during the ATIM implementation period (D'Amico et al., 2015) provides further detail on practices in allocation of ITA funding.

modules offered in their regions. For those who enrolled in such training, completion rates were relatively high. Note that 42 individuals, or 8 percent of the sample, completed all four MSSC modules, leading to a CPT credential.

Exhibit III-1: Enrollment in and Completion of MSSC Training Modules

MSSC Training Module	Number Enrolled in Training	Percent of Total ATIM Participants Enrolled	Number Successfully Completing Training	Percent of Enrolled Successfully Completing Training
MSSC-Intro to Manufacturing & Safety	438	85.2%	321	73.3%
MSSC - Quality Practices & Measurement	70	13.6%	60	85.7%
MSSC - Manufacturing Process & Production	68	13.2%	62	91.2%
MSSC - Maintenance Awareness	51	9.9%	45	88.2%

Source: ATIM Tracking System

Exhibit III-2 below explores the same outcomes—enrollment in and completion of training—for the key subgroups identified in the previous chapter. As shown, participants had similar and similarly high training enrollment and completion rates, with no statistically significant differences noted.

Exhibit III-2: ATIM Participant Enrollment and Completion of Training, by Subgroup

Subgroup	N	Number Enrolled in Training	Percent of Total ATIM Participants Enrolled	Number Successfully Completing Training	Percent of Enrolled Successfully Completing Training
Education					
HS or less	227	220	96.9%	162	73.6%
More than HS	287	271	94.4%	204	75.3%
Date of Random Assignment					
Early RA	270	256	94.8%	196	76.6%
Late RA	244	235	96.3%	170	72.3%
Prior Manufacturing Experience					
No Prior Experience	225	216	96.0%	162	75.0%
Prior Experience	289	275	95.2%	204	74.2%
Overall	514	491	95.5%	366	74.5%

Source: Illinois Workforce Development System (IWDS) database and ATIM Tracking System

ATIM participants also had the option to enroll in additional occupational skills training programs beyond the MSSC modules, leading to receipt of an industry-recognized credential or certificate, and approximately three-quarters of participants chose to pursue this additional training. As shown below in Exhibit III-3, the occupational skills training field most frequently pursued by ATIM participants was machining: 43 percent of ATIM participants enrolled in a machining training program, and of those who enrolled, 85 percent successfully completed training. Other training fields accessed by ATIM participants include welding (20 percent of ATIM participants enrolled, with a 76 percent completion rate) and mechatronics (9 percent of ATIM participants enrolled, with an 88 percent completion rate). The least commonly accessed training field was logistics, with only 20 total enrollments (4 percent of the program group), 80 percent of whom did not complete the program. As explained in the implementation report (Betesh et al., 2015), only three regions (North Central, Southwest, and Northern Stateline) offered occupational skills training in demand was limited in all three areas; additionally, only North Central and Northern Stateline ultimately recorded any training enrollments in logistics.

Exhibit III-3: Enrollment in and Completion of Additional Occupational Skills Training

Training Field	Number Enrolled in Training	Percent of Total ATIM Participants Enrolled	Number Successfully Completing Training	Percent of Enrolled Successfully Completing Training
Machining	219	42.6%	187	85.4%
Welding	104	20.2%	79	76.0%
Mechatronics	48	9.3%	42	87.5%
Logistics	20	3.9%	4	20.0%
Overall	**391**	**76.1%**	**324**	**82.9%**

Source: Illinois Workforce Development System (IWDS) database

ATIM participants completed their MSSC training on a fairly accelerated timeline, consistent with program goals. MSSC training modules were designed to be completed in a short timeframe, ranging from one week for an intensive course in the safety module in Northern Stateline to twelve weeks for completion of the full four-module CPT curriculum in Central. The median length of time between random assignment and completion of an additional occupational skills training program was approximately five months (as noted in the next chapter, this length of time may explain why ATIM participants had lower employment rates than those in the control group during the first two quarters after random assignment). Median length of time between random assignment and completion of occupational skills training was lowest in the Central and Northern Stateline regions, and highest in the Southwestern region. Participants who enrolled in programs offered by proprietary training providers completed their training more quickly than those who accessed training programs offered by community colleges—consistent with findings from the implementation study (Betesh et al., 2015) that in general, proprietary training providers were able to offer more nimble scheduling outside of a semester system, though regions did cite a small number of instances in which community college were able to start open-entry cohorts with as few as two trainees.

As for work-based training, no job shadowing activities were recorded in the ATIM tracking system, and as shown in Exhibit III-4 below, very few ATIM participants engaged in work experience or OJT programs—though completion rates among those participating were high. This low uptake is consistent with the implementation study (Betesh et al., 2015) finding that regions struggled to recruit employers to participate in work-based training due to an array of concerns. Some employers did not consider internships, which were often set up to be three to four weeks long, to have benefits that were worth the investment in training ATIM participants. Additionally, some employers were reluctant to participate in OJT because they perceived government programs to be overly bureaucratic or slow, particularly if they had not previously worked with the public workforce system.

Exhibit III-4: Enrollment in and Completion of Work-Based Training

Work-Based Training	Number Enrolled in Training	Percent of Total ATIM Participants Enrolled	Number Successfully Completing Training	Percent of Enrolled Successfully Completing Training
Internships	14	2.8%	12	85.7%
Work Experience	8	1.6%	7	87.5%
On-the-Job Training (OJT)	36	7.0%	34	94.4%

Source: ATIM Tracking System

Impacts of ATIM on Enrollment in Training Funded by the Public Workforce System

Both ATIM participants and control group members had access to training funded by the public workforce system: through ATIM for ATIM participants and through WIA for members of the control group. Did participation in ATIM increase the rate at which individuals enrolled in such training? Did it increase the rate at which individuals completed training and earned the relevant credentials? Comparing data for ATIM participants and for members of the control group offers tentative answers to these questions.

The answers remain tentative mainly because members of the control group enrolled in WIA-funded training in such low numbers. Despite already having been screened and determined eligible for WIA, less than one third of control group members actually enrolled in WIA, and of those, not all enrolled in WIA-funded training. To comply with random assignment procedures, ATIM staff members were instructed by the state not to provide special assistance in connecting control group participants to WIA after random assignment, but control group members could still connect to this program on their own and were aware of the training benefits available through WIA. One possible explanation for the low enrollment rates in WIA is that by the time control group members learned of their assignment to that group and their resultant inability to participate in a specific sectoral training program through ATIM, they were eager to get back to work. (For control group members who *did* enroll in WIA, 71% pursued manufacturing-related programs in one of the four ATIM training tracks, consistent with their

interest in enrolling in ATIM in the first place.) Another reason the findings described here should be interpreted cautiously is that some control group members may have pursued training that was either self-funded or funded through sources other than WIA—though, given control group members' WIA eligibility and knowledge of their option to enroll in WIA, WIA-funded training would have offered an attractive alternative to ATIM for this group.

Data on training uptake through the public workforce system show that participating in ATIM led to significantly higher rates of enrollment in occupational skills training and significantly higher rates of certificate attainment, as shown in Exhibit III-5. As described earlier, nearly all ATIM participants enrolled in training funded through the program, which is to be expected given that such training was a critical component of the ATIM model. By contrast, just under a quarter of control group members enrolled in training funded by the public workforce system, and this difference was statistically significant. Similarly, looking at the full sample[15], nearly three-quarters of ATIM participants completed any occupational skills training program, compared with less than one-quarter of control group members, and over three-quarters of ATIM participants attained a certificate, compared with less than a quarter of control group members. Additionally, ATIM participants earned, on average, two more certificates than control group members, and this difference is statistically significant.

Exhibit III-5: Impacts of ATIM on Enrollment in and Completion of Occupational Skills Training

Impacts	ATIM Participants	Control Group	Difference
Enrolled in training	93.5%	23.7%	69.8%***
Completed training	71.7%	19.7%	51.9%***
Attained a certificate	76.1%	21.0%	55.1%***
Average number of certificates earned	2.5	0.5	2.0***

Source: Illinois Workforce Development System (IWDS) database

Note: Estimates presented are regression-adjusted impacts. Estimates were weighted to equalize the odds of selection into the groups. The difference may vary slightly from what may be expected due to rounding.

Differences are significant at ***p<0.01, **p<.05, and *p<0.10.

Impacts on receipt of work-based training cannot be presented because only two control group members enrolled in OJT through WIA. This low rate of enrollment in work-based training for control group members, along with low rates of enrollment in work-based training for ATIM participants, limits possible analyses of differences in outcomes between the two groups. Additionally, due to the low numbers of control group members who enrolled in either occupational skills training or work-based training, this chapter does not present impacts for subgroups of interest identified in Chapter II.

[15] These numbers are presented for the full sample because training enrollment occurred after random assignment, and it is therefore not appropriate to estimate *impacts* just for those who enrolled in training because doing so would erode the equivalence between ATIM participants and the control group achieved through random assignment.

Summary and Synthesis of Findings

The findings presented in this chapter offer evidence of the value of ATIM for program participants relative to a control group offered access to WIA, though the findings do not capture training activities pursued outside of the public workforce system. The significantly higher rates of enrollment in workforce system-funded training for ATIM participants versus those in the control group suggest that a key benefit of ATIM participation was support and guidance in *connecting* to training. While members of the control group knew about and were eligible for WIA, they did not receive specific assistance with enrolling in WIA and accessing funding for training, and ultimately pursued and completed training at much lower rates than did ATIM participants. Additionally, the higher average number of certificates attained—and the relatively short span of time during which they were attained—indicates that ATIM participants may also have received more support with connecting to accelerated training options, stacking their credentials and advancing along career pathways than those in the control group. This indicates the realization of a key component of the program model (as well as a key priority under WIOA). Taken together, these findings indicate that the training model developed under ATIM, wherein participants can access both funding and sector-specific guidance for occupational skills training, provides workers with the support and structure they need to advance their skills and careers.

Chapter IV: Impacts of ATIM on Employment and Earnings

ATIM's primary goals were to improve the employment prospects and earning power of its participants. Assessing the program's success in realizing these goals consisted of two analytical steps: measuring the employment and earnings outcomes of ATIM participants and control group members and then comparing these outcomes to determine program impacts. This chapter describes the results of both steps and additionally looks at how outcomes and impacts varied for subgroups of interest.

Key Findings

- **Most ATIM participants were able to find employment at the end of their time in the program.** Among all ATIM participants, 71 percent exited the program with employment, and 63 percent of these participants found training-related employment.
- **ATIM had positive impacts on earnings.** By the second year following random assignment, ATIM participants had higher earnings than those in the control group, and this difference was statistically significant.
- **ATIM had some positive impacts on employment.** ATIM participants had higher employment rates than control group members by the second year after random assignment, and these differences were statistically significant in the third, fifth, sixth and seventh quarters after random assignment. ATIM participants, however, did not take any less time than members of the control group to find unsubsidized employment, nor did they have a higher rate of employment retention.

Employment Outcomes of ATIM Participants

Of all ATIM participants included in the study, 71 percent (or 358 ATIM participants) exited the program with employment. Of these 358 participants, 63 percent (or 224 ATIM participants) found employment related to their manufacturing training. To explore these outcomes further, Exhibit IV-1 on the next page shows differences in outcomes across the subgroups introduced in Chapter II. As shown in the exhibit, employment outcomes were relatively similar for those with less than and more than a high school education. Differences did emerge, however, for the two other subgroups: those who enrolled earlier in the random assignment intake period were more likely to exit with employment than those who enrolled later, and those with prior manufacturing experience were more likely to exit with employment. Rates of training-related employment were generally similar across and within subgroups, except, unsurprisingly, for

prior manufacturing experience: those with prior experience were more likely to obtain training-related employment than those without.

Exhibit IV-1: ATIM Employment Outcomes by Subgroup

Subgroup	N	Number Exited with Employment	Percent Exited with Employment	Number with Training-Related Employment	Percent with Training-Related Employment
Education					
HS or less	225	165	73.7%	104	63.2%
More than HS	280	193	69.6%	120	62.5%
Date of Random Assignment			†		
Early RA	266	198	74.8%	122	62.0%
Late RA	239	160	67.7%	102	63.8%
Prior Manufacturing Experience			†		†
No Prior Experience	221	146	66.5%	77	53.1%
Prior Experience	284	212	75.2%	147	69.5%
Overall	505	358	70.9%	224	62.6%

Source: ATIM Tracking System

Notes: †The difference in the outcomes between the subgroups is statistically significant at the .10 level (the symbol is placed by the impact estimate of the first group of the subgroup pair).

Percent with training-related employment calculated based on those who exited with employment.

Employment and Earnings Impacts

Comparing the employment and earnings outcomes of ATIM participants to those of control group members reveals the impact of ATIM training and programming—that is, the effects of ATIM programming relative to what would have happened in its absence. A primary way to measure the impact of ATIM is to compare the employment status and average earnings of ATIM participants and control group members over time. A snapshot of employment status and earnings in the first and second years following random assignment, shown in Exhibit IV-2, illustrates how these outcomes differed for the two groups over time after random assignment. The ATIM program did not yield any statistically significant differences in employment or earnings between ATIM participants and the control group in the year following random assignment. However, in the second year following random assignment, ATIM participants had slightly higher employment and higher earnings, on average, than the control group; this difference was statistically significant for total earnings, though not for average number of quarters employed.

Exhibit IV-2: Impacts on Employment and Earnings in the Two Years after Random Assignment

Years after RA	Numbers of Quarters Employed			Total Earnings		
	ATIM Participants	Control Group	Difference	ATIM Participants	Control Group	Difference
1st Year after RA	2.7	2.5	0.2	$14,798.42	$15,029.06	-$230.64
2nd Year after RA	3.1	2.8	0.3	$25,337.60	$19,861.99	$5,475.61**

Source: IDES UI wage data

Notes: Estimates presented are regression-adjusted impacts. Individuals randomly assigned during the first half of the intake period have a greater number of quarters of follow-up data than those randomly assigned during the second half of the intake period; thus, those in the latter category are not as well represented in the later quarters of follow-up data. Data is available for 711 study participants for the first year after random assignment and for 357 study participants in the second year after random assignment. Estimates were weighted to equalize the odds of selection into the groups. Differences are significant at ***p<0.01, **p<.05, and *p<0.10.

However, a quarter-by-quarter analysis yields a more nuanced look at employment (and earnings) impacts. To further explore short-term versus long-term program impacts, the graphs in Exhibits IV-3 and IV-4 visualize this comparison using the time of random assignment as the temporal reference point, plotting data for the eight quarters preceding and eight quarters following random assignment. These graphs show that ATIM participants and members of the control group did not differ in employment or earnings in the eight quarters (that is, two years) prior to random assignment. In the quarter following random assignment, ATIM participants had lower employment rates and lower earnings than the control group. This relationship shifts in the second quarter after random assignment for employment and in the third quarter after random assignment for earnings: after these points, ATIM participants show more positive employment and earning outcomes than members of the control group. These differences are significant in quarters three, five, six, and seven for employment rates and in quarters six and seven for earnings.[16]

[16] While the differences between ATIM participants and control group members are positive and large in the eighth and ninth quarter of follow-up, the ability to detect statistical differences was reduced for this period because data were available only for those assigned very early in the intake period. A sensitivity analysis examined trends in employment and earnings for the study participants assigned early in the intake period, where a full 2 years of UI wage data was available, to verify that sample composition, such as timing of random assignment, may correlate with the outcome variables. The findings were robust to sample specification and are consistent with the findings presented in Exhibit IV-3 and IV-4.

Exhibit IV-3: Trends in Employment Before and After Random Assignment

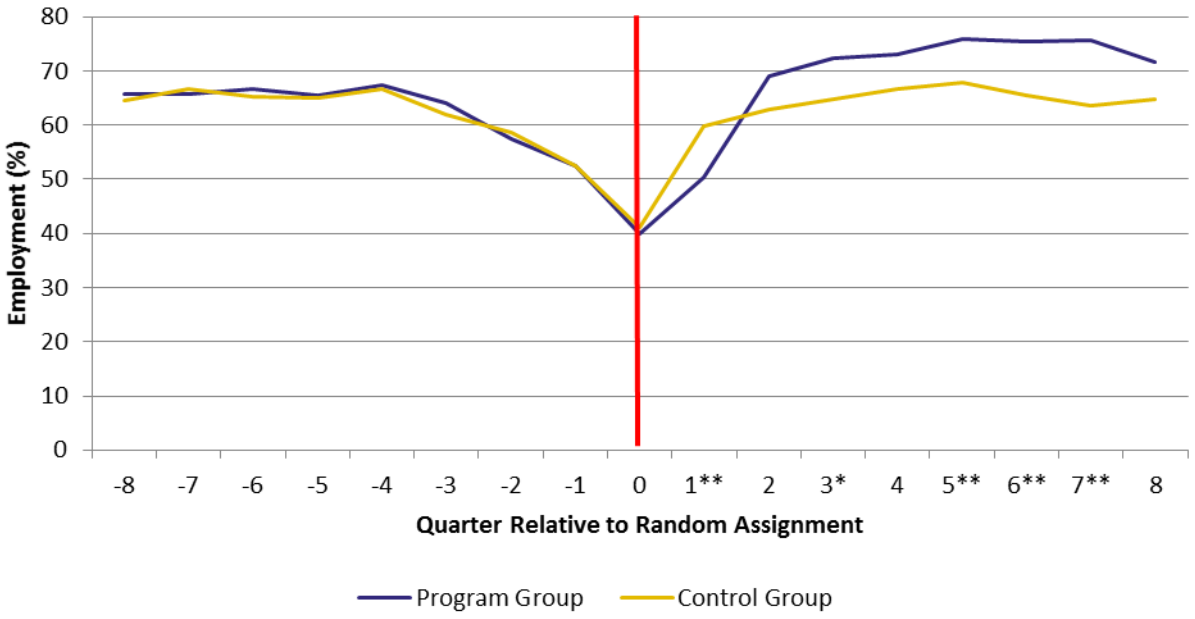
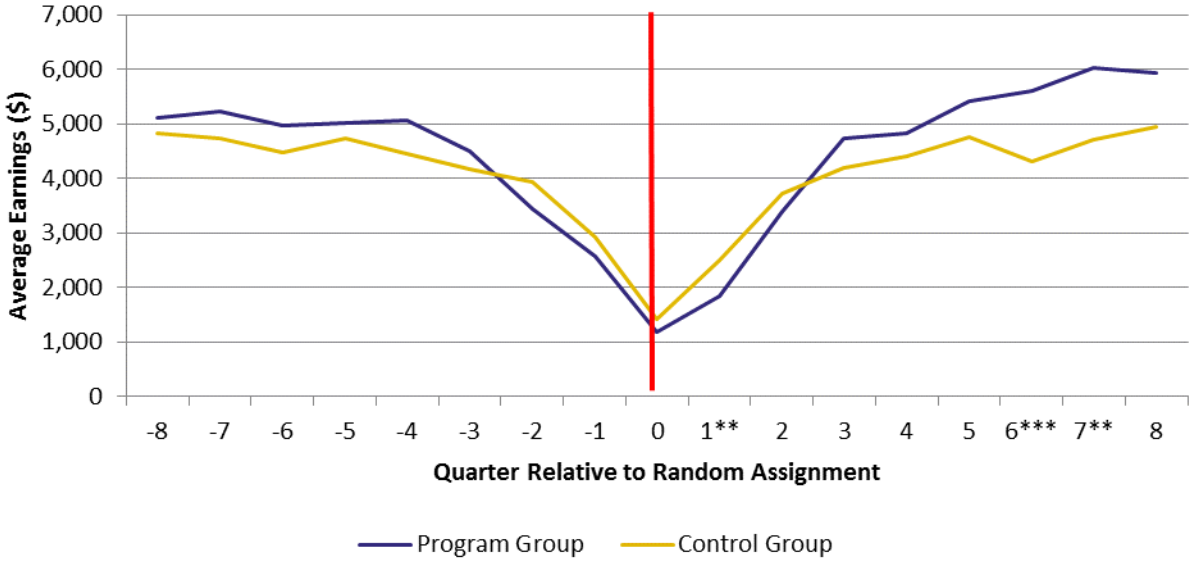


Exhibit IV-4: Trends in Earnings Before and After Random Assignment



Source: IDES UI wage data

Notes: Individuals randomly assigned during the first half of the intake period have a greater number of quarters of follow-up data than those randomly assigned during the second half of the intake period; thus, those in the latter category are not as well represented in the later quarters of follow-up data.

Differences are significant at ***p<0.01, **p<.05, and *p<0.10.

Overall, while ATIM participants had lower earnings and rates of employment in the quarters immediately following random assignment (potentially due to participation in occupational skills training), they show higher rates of employment and higher quarterly earnings than the members of the control group in the long run. The same trends were generally observed for the key subgroups specified in Chapter II, and as shown in Exhibit IV-5, for one subgroup (timing of enrollment) the differences between subgroup pairs are statistically significant. However, program impacts by subgroups should be interpreted cautiously given that the reduced sample does not reflect the full analytical sample of the random-assignment study; additionally, the small sample sizes resultantly reduce the ability to detect impacts.

Exhibit IV-5: Subgroup Analysis — Impacts on Employment and Earnings

Subgroup	Quarters Employed		Total Earnings	
	1st Year after RA	2nd Year after RA	1st Year after RA	2nd Year after RA
Education				
HS Education or Less	0.1	0.3*	$910.33	$3,982.49**
More than HS Education	0.1	0.4***	-$1,069.85	$4,657.27*
Timing of Enrollment				†
Early RA	0.0	0.4***	-$514.63	$3,432.89***
Late RA	0.2	0.4***	$154.05	$9,390.69***
Prior Manufacturing Experience				
No Prior Manufacturing Experience	0.1	0.2	-$995.99	$2,507.35
Prior Manufacturing Experience	0.1	0.5**	$329.66	$5,666.23**

Source: IDES UI wage data

Notes: Estimate presented are regression-adjusted impacts. Estimates were weighted to equalize the odds of selection into the groups. The numbers provided in this table represent the difference between ATIM participants and the control group for each of the specified subgroups. Negative values reflect ATIM participants having lower employment or earnings, respectively, whereas positive values reflect ATIM participants having higher employment or earnings compared to the control group.

Differences are significant at ***p<0.01, **p<.05, and *p<0.10.

†The difference in the outcomes between the subgroups is statistically significant at the .10 level (the symbol is placed by the impact estimate of the first group of the subgroup pair).

Summary and Synthesis of Findings

ATIM participants did not have higher employment and earnings than the control group in the first year following random assignment but did in the second year following random assignment, and this difference was statistically significant for earnings and for employment rates in select quarters. This finding is consistent with existing studies of other workforce

training programs, which often show long-term benefits after a delay while program participants engage in education and employment services (McConnell et al., 2016; Trause & Weeks, 2012). Furthermore, unlike what has been observed in other workforce training programs, ATIM participants achieved both employment and earnings gains without experiencing a long delay in entry into the labor force as would be expected given higher enrollment in training.

One area for further exploration, however, is that while the follow-up period is sufficient to measure short-term employment outcomes, the timelines of both program implementation and the WIF grant did not allow for a long enough follow-up period to enable the evaluation to assess the longer-term labor market effects of the intervention. While ATIM participants had higher employment and earnings in the second year following random assignment, the sample sizes were substantially reduced during this time period. To assess program impact on the full study sample as well as assess the duration of program impact, it would be highly beneficial, then, to conduct longer-term follow-up on the full sample of study participants to identify whether and for how long these positive impacts from the program persist.

Chapter V: Costs and Cost Effectiveness of ATIM

As described in the previous chapter, ATIM had positive impacts on program participants' employment and earnings outcomes in the second year after random assignment. This chapter describes and analyzes the costs of achieving these gains, including an overview of how the Workforce Innovation Fund (WIF) grant was spent in the regions, comparing per-participant costs to those for WIA services available to the control group, and measuring how much the ATIM program spent to generate the observed gains in employment outcomes for ATIM participants, both on their own and relative to those of control group members. The results of the cost study should, however, be interpreted cautiously due to the fact that, as described in earlier chapters of this report, most control group members did not ultimately enroll in WIA, and the cost study does not include costs for any non-WIA services accessed. Additionally, WIA cost estimates are for all participants, as costs cannot be estimated separately for those who accessed WIA-funded occupational skills training (which would have been more similar in resource intensity to ATIM).

Key Findings

- **Across regions, spending on training for participants represented the main use of grant funds.** Training costs accounted for roughly half of grant spending for most regions (and over 80 percent in one region), consistent with the program's emphasis on connection to occupational skills training.
- **Costs per participant varied across regions, driven by the intensity of service uptake for ATIM participants rather than by enrollment levels alone.** Regions with higher rates of training enrollment needed to spend more on both staffing and training, yielding higher costs per participant.
- **The average per-participant cost for ATIM was significantly higher than the per-participant cost for the WIA Adult and Dislocated Worker programs.** The average per-participant cost for ATIM was $9,991, which is over three times the average per-participant cost under WIA for ATIM regions during the program implementation period. However, this likely understates WIA costs, as it encompasses all WIA participants regardless of whether they enrolled in training.
- **Although ATIM had positive impacts on earnings and employment, the program had to spend high amounts to achieve these gains.** For every additional week of employment for an ATIM participant relative to a control group member, ATIM spent approximately $1,900. In terms of earnings, the ATIM program spent approximately $1.36 per $1 increase in average quarterly earnings for each ATIM participant relative to a control group member.

Data Sources

The analysis presented in this chapter uses cost data for ATIM and WIA obtained from the Illinois Department of Commerce and Economic Opportunity (DCEO) accounting system. Because both programs reported their costs using this same system, the categories for types of cost are comparable.

ATIM Cost Data

Aggregated cost data for the entire ATIM implementation period was available for each region,[17] broken out by the following expense categories:

- Personnel and fringe: salaries and benefits (leave, insurance, pensions, and unemployment benefit plans) for individual program staff
- Contractual: consultants, audit, technical assistance, and professional service contracts
- Travel: transportation, lodging, mileage, and related costs incurred while staff members are on travel status on official business
- Supplies: goods acquired for the purpose of current operations, such as office supplies
- Training: costs associated with participant enrollment in and completion of training
- Supportive services: services provided to eligible participants including transportation reimbursement or vouchers, childcare, dependent care, housing, and needs-related payments
- Other: all other allowable costs not elsewhere classified
- Leveraged resources: all allowable costs for goods and services provided to grant participants or in support of the grant program that were paid for using non-WIF funds. Region were required by DCEO to provide and report a 20% leveraged resources match as a condition of receiving WIF funds.

While the ATIM program differentiated between classroom-based and work-based training, cost data do not differentiate between these two types of training services. This chapter therefore considers program costs in the aggregate rather than looking at costs of specific aspects of service delivery.

[17] Discounting of ATIM cost data was not feasible given that the analysis used only total program costs, across years. However, the expectation is that discounting of cost data to adjust for inflation would not notably impact the findings of this chapter, given that limited inflation adjustments would have been needed from 2013 to 2015.

WIA Cost Data

As discussed in Chapter II, members of the control group were eligible for, aware of, and permitted to enroll in WIA Adult and/or Dislocated Worker programs. Consistent with the impact analysis, this chapter assesses the ATIM program costs required to achieve impacts relative to the cost of WIA services available to the control group. As with the impact analysis, WIA serves as a counterfactual because it represents both a likely alternative option for control group members and because, in the absence of the WIF grant, the participating LWIAs would have likely served jobseekers from the study sample through WIA if they had sought occupational skills training through the public workforce system. The evaluation's original design planned a cost-effectiveness analysis with the assumption that most control group members would enroll in WIA. However, only one-third of control group members ultimately enrolled in WIA, which makes it difficult to conduct a true cost-effectiveness analysis. Given that so few control group members enrolled in WIA, and given that both ATIM participants and control group members could have enrolled in other services for which costs are unknown, calculations of program costs required to achieve impacts are not precise estimates of cost-effectiveness and should be interpreted with caution.

With these limitations in mind, the research team used WIA expenditure data (both formula funds and state set-aside funds for administration) for each ATIM region's participating LWIAs for Program Years 2013, 2014, and 2015, as well as data on how many unique participants were served in the WIA program for each respective year, to estimate the average cost of WIA services available to the control group. It is important to note that the WIA expenditure data used encompasses all participants, not just those who enrolled in training, both because most WIA participants in these LWIAs did not participate in training and because it is difficult to precisely allocate non-training costs only for those who enrolled in training given that there may be differences in use of certain resources (such as supportive services and case management) for those who enroll in WIA-funded training. The average per-participant cost was prorated to reflect the same duration as was used for calculating the total cost for the program group (i.e. estimated average cost per WIA participant from mid-2013 through August 2015).[18] The per-participant cost for WIA is calculated as:

$$Per\ Participant\ Cost = \frac{Total\ Spending\ in\ PY\ 2013,\ 2014,\ and\ a\ Prorated\ Portion\ of\ 2015}{Total\ (Unduplicated) Enrollment\ in\ PY\ 2013,\ 2014,\ and\ a\ Prorated\ Portion\ of\ 2015}$$

To represent the possible spectrum of costs for services to control group members, the analysis presents two estimates of per-participant costs for the control group:

- A **lower bound estimate** was calculated by multiplying average cost per WIA participant by the number of control group members who enrolled in WIA.
- An **upper bound estimate** was calculated by multiplying average cost per WIA participant by the number of total control group members in the study.

[18] The cost study uses nominal dollars—or dollars that are unadjusted for inflation to align with the nominal dollars reported for ATIM program costs.

Presenting both estimates enables the analysis to account for both the fact that using the lower bound estimate may underestimate control group service costs (since control group members could have accessed other services in the community besides WIA, including self-funded training) and the fact that the upper bound estimate may overestimate control group service costs (since it is unlikely that *all* control group members chose to seek out other services and training options after random assignment).

Overall Costs for ATIM

Each ATIM region received a portion of the WIF grant, the size of which was determined by the region's target number of participants in the program (see Chapter II for expected and actual enrollment numbers by region). Exhibit V-1 shows ATIM costs by region for each type of expense category, and presents total costs (both with and without the reported leveraged resources used to deliver ATIM services), and costs per participant (both with and without the reported leveraged resources used to deliver ATIM services.

Exhibit V-1: ATIM Costs by Category and Region

Category	Central	Collar Counties	North Central	Northern Stateline	Southwest
Personnel & Fringe	$110,775	$98,853	$169,514	$185,705	$113,264
Contractual	$119,383	$188,250	$100,367	$353,025	N/A
Travel	$10,982	$8,086	$3,535	$5,727	$2,417
Supplies	$2,417	$1,823	$4,739	$704	$466
Other	$80,472	$32,444	$34,917	$226,231	$25,407
Training	$313,089	$1,723,005	$471,325	$399,837	$148,991
Supportive Services	$12,666	$74,789	$81,216	$21,332	$9,660
Total Grant Spending	**$649,784**	**$2,127,250**	**$865,613**	**$1,192,562**	**$300,205**
ATIM Participants	90	204	88	112	20
Cost Per Participant	**$7,220**	**$10,428**	**$9,837**	**$10,648**	**$15,010**
Leveraged Resources	$215,271	$446,422	$178,202	$174,303	$68,019
Total Cost	**$865,054**	**$2,573,672**	**$1,043,814**	**$1,366,864**	**$368,224**
Average Cost Per Participant (with Leveraged Resources)	**$9,612**	**$12,616**	**$11,862**	**$12,204**	**$18,411**

Source: DCEO cost data on ATIM regional spending and leveraged resources

As shown above, Collar Counties had the highest total costs, consistent with its higher-than-expected enrollment and the fact that, as the most urban of the regions, cost of living and salaries are therefore higher. Southwest had the lowest total costs due to its very low enrollment. Across regions, training costs for participants were the largest share of each region's spending, accounting for roughly half of total grant spending for North Central,

Southwest, Northern Stateline and Central, and for over 80 percent of total grant spending in Collar Counties. North Central spent also a larger share of its grant funds on supportive services compared to other regions. Contractual costs were particularly high for Northern Stateline region, where ATIM contracted with a local Goodwill agency to staff the program. Taken together, these reported expenditures resulted in total grant spending which ranged widely across regions. Because enrollment levels also varied across regions, looking at costs per participant for ATIM provides a useful metric for comparing spending across and within regions. While per-participant costs were highest in Southwest (which is to be expected given that region's very low enrollment), Central and North Central had the lowest per-participant costs, despite having fewer participants than either Collar Counties or Northern Stateline. Per-participant costs therefore appear to be correlated less with actual enrollment and more with the extent of services accessed per participant. Collar Counties and Northern Stateline enrolled more participants than other regions, but also had the highest percentages of overall training enrollment across regions, which required funding training (and staffing) at higher total amounts to account for higher uptake of services for those enrolled. Additionally, Collar Counties and Northern Stateline both engaged private training providers as key partners on the grant, which may have led to higher training costs.

It is also important to note that total grant spending does not represent the full cost of delivering ATIM services, as DCEO required regions to provide a 20% leveraged resources match as a condition of receiving WIF funds, and these resources are therefore important to understanding what the program actually cost to operate. Regions mainly used the time of WIA-funded case managers who also worked on ATIM to meet the leveraged resources requirement, and leveraged resources amounts consequently varied considerably based on regions' enrollment levels and, therefore, caseload levels. All regions met the 20% leveraged resources requirement except for Northern Stateline, which as noted earlier relied on case management assistance from Goodwill via subcontract (rather than by WIA case managers via leveraged resources, as was the case in other regions). Staffing therefore emerges as a key program cost not fully captured in grant spending, since most regions funded their staffing in part through leveraged resources. Accounting for grant spending plus leveraged resources to calculate cost per participant, this amount again was highest in Southwest and lowest in Central and North Central, echoing earlier findings that cost per participant depends on intensity of service engagement and types of training providers rather than simply on enrollment levels.

Comparison of Costs for ATIM and WIA

To contextualize the costs per participant for ATIM discussed above, it is useful to consider how these costs differed from those for the WIA services available to the control group. Exhibit V-2 on the following page details the program costs, number of participants served, and average per-participant costs for the ATIM program as compared for the WIA program. (Note that the estimates presented for ATIM do not include leveraged resources, as ATIM regions primarily used WIA funding for leveraged resources and inclusion of leveraged resources in per-participant cost calculations would therefore require counting WIA funding for both programs). While average per-participant costs for ATIM across the regions varied notably as noted earlier,

average per-person costs for the WIA program—calculated using both an upper bound estimate for services to all members of the control group and a lower bound estimate only for those who actually enrolled in WIA—were similar across the five regions. The average per-participant cost among ATIM participants was also higher than the average per-participant cost among WIA enrollees across all regions. As a demonstration program, ATIM's model and the resources needed to deliver it were less fixed than for WIA, and ATIM was also designed to provide more intensive assistance than WIA for connecting participants to both occupational skills training and work-based training, so it is to be expected that ATIM's costs per participant would be both higher overall and more variable across regions than costs per participant for WIA. Additionally, as noted earlier, the WIA costs presented are for all WIA participants, regardless of whether they enrolled in training; training is more cost-intensive than other WIA services, and per-participant cost estimates would likely be higher for those who enrolled in WIA-funded training.

Exhibit V-2: Costs per Participant for ATIM and WIA

Description	ATIM	WIA	
		Lower Bound	Upper Bound
Total Costs	$5,135,414	$170,339	$585,073
Participants	514	68	224
Average Cost Per Participant	**$9,991**	**$2,505**	**$2,612**

Source: DCEO cost data for ATIM and WIA programs during the ATIM implementation period

In addition to comparing per-participant costs for ATIM and WIA, it is also instructive to consider the ATIM costs required to achieve observed differences in outcomes between ATIM participants and members of the control group. This approach can be estimated as follows:

$$Cost\ per\ Percentage\ Point\ Difference\ in\ Outcome = \frac{Cost_{program} - Cost_{control}}{Outcome_{program} - Outcome_{control}}$$

Estimates of the costs required to achieve observed impacts for employment and for earnings are displayed in Exhibit V-3. Overall, ATIM spent approximately $1,900 for every additional week an ATIM participant was employed relative to a member of the control group. Additionally, ATIM spent approximately $1.36 to achieve a $1 increase in earnings for an ATIM participant relative to a member of the control group. For both measures, then, regardless of whether the calculation uses the lower bound or upper bound estimate of WIA costs, the ATIM program had to spend significantly more than was spent on WIA in order to obtain the additional increase in outcomes for ATIM participants beyond what was observed for the control group. This finding may simply be evidence for the law of diminishing returns—that is, at higher employment rates, the added benefit of an additional dollar spent on further improving employment outcomes declines. Additionally, it is important to consider that, as noted earlier, ATIM was a new program which involved significant front-end investment in arranging staffing, partnerships and services beyond those required for an established program like WIA.

Exhibit V-3: ATIM Costs Required to Achieve Differences in Key Outcomes

Outcomes	Difference in Outcomes Between ATIM and WIA	ATIM's Cost per Percentage-point Increase over Control Group Outcomes	
		Lower Bound	Upper Bound
Employment	3.9 additional weeks of employment	$1,919.49	$1,892.05
Earnings	$5,475.61	$1.37	$1.35

Source: IDES UI wage data and DCEO cost data for ATIM and WIA during the ATIM implementation period

Notes: Estimates were weighted to equalize the odds of selection into the groups. Program group were employed 0.3 quarters longer than the control group in the second year following random assignment. For the purposes of the cost study, one quarter is converted to 13.0 additional weeks employed.

Summary and Synthesis of Findings

While the impact analysis found that ATIM participants made greater gains in earnings and select quarters of employment from baseline through follow-up than the control group, the program had to spend more per participant to achieve these gains than was spent on the WIA services available to the control group. However, this conclusion must be interpreted within a broader context. The evaluation period examined outcomes for a relatively short period during and immediately following ATIM program implementation. By contrast, the cost-effectiveness study assigned all the costs of program planning, development, and implementation to the cost of serving the ATIM participants during the study period. Some of these expenditures—such as the development and implementation of new partnerships; the creation of an online system to handle applications, joint case management, individualized training & employment plans, and dashboards to track services and outcomes; and the development of contracts with and programs for training providers—can be thought of as investments in developing the longer-term capacity of the public workforce and education system to support sectoral initiatives. For example, the online system designed for ATIM is now being used to support the state's implementation of the U.S. Department of Agriculture's Employment Opportunities, Personalized Services, Individualized Training and Career Planning Initiative (EPIC). There is also the potential for adapting the joint case management functions to allow cross-program teams of WIOA partner staff to jointly manage services provided to co-enrolled individuals, and developing such capacity has immediate implications for the ability of participating LWIAs to deliver ATIM-type services in a cost-effective manner under WIOA. Because evidence suggests that sectoral training programs have longstanding, enduring impacts (e.g., Heinrich & King, 2011), it is reasonable to suppose that this short-term assessment of ATIM cost effectiveness may overestimate the ongoing marginal costs of the ATIM program for participants and underestimate the long-term gains accruing to program participants. A longer-term assessment of program costs and impacts may have yielded somewhat different conclusions about the ATIM program's cost effectiveness, and further research is needed to understand the true cost-effectiveness of models such as this one.

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Chapter VI: Summary and Conclusions

This chapter summarizes the findings from the impact evaluation, reviews the effectiveness of the ATIM program model, considers how different features of the ATIM model and the implementation experience may have influenced the study findings, and discusses the implications of ATIM evaluation findings for Illinois and other states interested in furthering the goals and implementing the key themes of the WIOA legislation.

Key Findings

ATIM participation had a positive impact on training enrollment, training completion, employment, and earnings.

- **ATIM participants were much more likely to enroll in training than members of the control group.** Nearly all ATIM participants enrolled in training, and over three quarters of ATIM participants enrolled in occupational skills training beyond the required MSSC Safety modules. By contrast, less than a quarter of control group participants enrolled in WIA-funded training in any field.

- **ATIM participants had higher rates of certificate attainment and earned more total certificates, on average, than those in the control group.** Over three-quarters of ATIM participants attained at least one certificate during the study period, compared with less than one-quarter of control group members, and ATIM participants earned, on average, two more certificates than control group members during the study period.

- **ATIM participants experienced higher rates of employment following random assignment than members of the control group.** Higher employment rates were documented during the second year after random assignment, and differences in employment rates between ATIM participants and control group members were statistically significant in the third, fifth, sixth and seventh quarters after random assignment.

- **ATIM participants experienced higher earnings following random assignment than members of the control group.** Statistically significant differences in earnings were documented during the second year following random assignment, with ATIM participants earning an average of approximately $4,334 more during that year than control group members.

The cost study showed that ATIM impacts were achieved at a relatively high cost per participant.

- **Costs per participant varied across regions, driven by the intensity of service uptake and type of training partners rather than by enrollment levels alone.** Regions with higher rates of training enrollment and those that engaged private training providers as key grant partners needed to spend more on both staffing and training, yielding higher costs per participant.

- **The average per-participant cost for ATIM was significantly higher than the per-participant cost for the WIA Adult and Dislocated Worker programs during the grant period.** The average per-participant cost for ATIM was $9,991, which is over three times the average per-participant cost under WIA for regions during the program implementation period.

- **Although ATIM participants enjoyed higher earnings and higher rates of employment, the program had to spend high amounts to achieve these gains.** Overall, ATIM spent approximately $1,900 for every additional week an ATIM participant was employed relative to a member of the control group. Additionally, ATIM spent approximately $1.36 to achieve a $1 increase in earnings for an ATIM participant relative to a member of the control group.

On some measures, similar outcomes were observed for ATIM participants and members of the control group.

- **Neither ATIM participants nor control group members participated to a significant extent in work-based training, such as internships or on-the-job training.** A total of 12 percent of the program group participated in one of the ATIM program's work-based training offerings (work experience, internships, or on-the-job training). Only two individuals in the control group participated in work-based training through the WIA program.

- **There was no significant difference in time to employment or job retention between ATIM participants and the control group during the study period.**

Interpreting and Applying the ATIM Evaluation Findings

The evaluation findings provide further evidence for the effectiveness of sectoral employment training strategies and the use of employer-recognized credentials and stackable certificates. The results of this evaluation, however, may not be generalizable to the universe of all potential participants of sectoral training programs, particularly those whose characteristics are different from those of the participants who went through random assignment for the ATIM net impact study.

Validation of the Effectiveness of Key Features of the ATIM Model

The generally positive impacts of the program on training participation and employment for ATIM participants adds to the existing evidence supporting the efficacy of the program features that were most fully realized by the ATIM model—a focus on preparing individuals for employment in expanding sectors of the economy offering relatively high wages, the use of employer-driven training, and the use of stackable credentials that allow students to enter and exit career pathways training at multiple points. The evaluation findings offer less conclusive evidence about the value of program features that were incorporated into the program model to a lesser extent, such as the utilization of work-based training and the provision of accelerated training schedules. The evaluation findings offer no information about the

effectiveness of intended program features that were not realized by the ATIM model as implemented; these include collaborative case management shared by workforce development staff members, employers, and training providers and the use of bridge-program models for individuals with limited basic skills preparation.

Limits to Generalizability of Study Findings

The screening procedures implemented during the time between ATIM application and random assignment—a drug test, objective assessments of academic skills, and face-to-face interviews to assess general job readiness skills—were intended to increase the likelihood that participants would be able to benefit from program services and meet employer expectations. This extensive process, together with the relatively long period that elapsed between application submission and the initiation of services, probably influenced the characteristics of the study participants in unintended ways. As noted in Chapter II, those who ultimately made it into the study tended to be particularly motivated to seek out, and have relevant skills or experience to obtain manufacturing-related employment. Looked at from another perspective, the extended period required to review applications and determine eligibility and fit appeared to have discouraged participation by a number of individuals, including those who had a pressing need for immediate employment income.

Both ATIM participants and members of the control group generally had a history of previous employment experience, had earned at least a high school diploma or GED, and did not self-report significant barriers to employment other than the prior misdemeanor or felony convictions reported by about one-fourth of those randomly assigned. Slightly more than half of the members of the study groups noted that they had previously worked in a position related to manufacturing. In addition, the study population reported relatively short spells of unemployment before entering the ATIM program—approximately half of the participants had earnings during the quarter prior to random assignment.

Because a significant number of those individuals in the broader population who might seek employment training—both in Illinois and elsewhere—have more barriers to employment, the study findings may not be generalizable to all WIOA participants. One must be cautious in generalizing the positive employment impacts noted for the typical ATIM participant to a broader set of program participants—those, for example, with less education, a more sporadic employment history, more serious employment barriers, or some combination of these.

These limits to the generalization of program results do not undermine the findings that the ATIM model was effective for participants with recent employment experience and transferrable skills. Moreover, the effectiveness of the model was robust enough to show positive impacts on employment even though ATIM was initiated at a time when the manufacturing sector was going through an economic downturn.

Lessons Learned about Implementation Feasibility

The regions participating in ATIM had difficulty realizing several features of the program model, as detailed in the implementation study report. In dealing with these challenges and coming to

understand their causes, the regions and the state had opportunities for learning lessons that can be applied to future initiatives with elements like those of ATIM and WIOA.

One key feature of the intended ATIM model that was difficult to achieve was developing close collaboration with employers and education and training institutions in designing and operating ATIM. The regional grantees had difficulty engaging employers, particularly during the early phases of program implementation, because many of the regions did not have a track record of working closely with employers on training initiatives and did not yet have trained participants ready for hire. Further, education and training institutions, although initially envisioned as key partners in the ATIM initiative, were not treated as equal partners in the early implementation efforts because of a state requirement that regions procure ATIM training provider partnerships through a competitive bid process. The ATIM experience taught the ATIM regions and the state that to do a better job of creating regional partnerships in future sectoral employment projects, they will need to (1) develop working partnerships with key players in advance of a particular initiative and (2) make sure that different stakeholder groups each have something to gain from participating in the collaborative effort.

A second unanticipated barrier to implementing ATIM as envisioned was the cumbersome and time-consuming nature of the participatory intake process developed by the regions to assess the readiness of ATIM applicants to enter manufacturing training, and the lack of sufficient case management staff in each of the local intake sites to implement the prescribed procedures in a timely fashion. In the next iteration of a sectoral training strategy, the state and local program areas learned that it will be important to ensure that the applicant review process is strong but streamlined and less time-intensive.

A third difficulty was implementing the ATIM program in largely rural regions of broad geographic extent. In these regions, it was difficult to match individuals to training providers and to employment opportunities that were within convenient commuting distance of their homes. The lesson here was clear: sectoral strategies are easier to implement in smaller geographic areas with higher concentrations of jobseekers, employers, and training providers.

Issues for Further Research

The ATIM evaluation findings confirm the value of many of the features of the ATIM program, providing evidence for their inclusion in the design of future training approaches under WIOA. Several additional research studies currently underway are working to advance the field's understanding of the effectiveness of sector-specific training initiatives in improving participant outcomes. Findings from the ATIM evaluation as well as other recent studies of sectoral training and career pathways initiatives (Hendra et al., 2016; Michaelides et al., 2014) confirm the potential of these training strategies and their potential applicability under WIOA. Together, these evaluation studies help confirm the effectiveness of using training programs that focus on providing the specific skills that are important in the local labor market. They also agree on the desirability of involving employers as active partners in providing high quality jobs that lead to career advancement opportunities for low-income workers. However, the evaluation findings

to date do not reveal the relative importance of different service components in bringing about these positive impacts.

To further specify the "active ingredients" of effective sectoral training program designs implemented under WIOA, additional research would be helpful in exploring the details of effective program design and implementation, including:

- What particular features of sector-focused training initiatives make the most difference in bringing about the desired program impacts?
- What are the most effective models for employer engagement?
- What program models work best for low-income individuals with serious employment barriers, including limited basic skills, which the WIOA legislation targets for priority access to services?
- To what extent are positive program impacts sustained over time?
- How can programs promote employment retention and further career advancement, once individuals are placed in their initial jobs after training?

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Appendix B: Supplemental Tables

Services and Training Outcomes for ATIM Participants by Region

Exhibit B-1: Enrollment in and Completion of Training, by Region

Region	N	Enrollment		Successful Completion	
		Count	Percent of All ATIM Participants in Region	Count	Percent of Enrolled
Central	90	88	97.8	67	76.1
Collar Counties	204	192	94.1	162	84.4
North Central	88	83	94.3	40	48.2
Northern Stateline	112	110	98.2	85	77.3
Southwest	20	18	90	12	66.7
Overall	**514**	**491**	**95.5**	**366**	**74.5**

Sources: Illinois Workforce Development System (IWDS) database and ATIM Tracking System

Exhibit B-2: Average Number of Credentials Attained for ATIM Participants, by Region

Region	Mean	Standard Deviation	Minimum	Maximum
Central	4.1	2.4	0	10
Collar Counties	3.0	2.0	0	7
North Central	0.7	1.2	0	7
Northern Stateline	1.8	1.2	0	5
Southwest	1.7	2.4	0	6
Overall	**2.5**	**2.1**	**0**	**10**

Source: Illinois Workforce Development System (IWDS) database

Exhibit B-3: Enrollment in and Completion of MSSC Training Modules, by Region

MSSC Training Module	Central		Collar Counties		North Central		Northern Stateline		Southwest		Overall	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Intro to Manufacturing & Safety												
Enrolled, % of ATIM Participants	83	92.2	165	80.9	72	81.8	103	92.0	15	75	438	85.2
Successful Completion, % of Enrolled	72	86.7	125	75.8	19	26.4	94	91.3	11	73.3	321	73.3
Quality Practices & Measurement												
Enrolled, % of ATIM Participants	63	70	—	—	—	—	—	—	6	30	70	13.6
Successful Completion, % of Enrolled	54	85.7	—	—	—	—	—	—	5	83.3	60	85.7
Manufacturing Process & Production												
Enrolled, % of ATIM Participants	61	67.8	—	—	—	—	—	—	6	30	68	13.2
Successful Completion, % of Enrolled	56	91.8	—	—	—	—	—	—	5	83.3	62	91.2
Maintenance Awareness												
Enrolled, % of ATIM Participants	44	48.9	—	—	—	—	—	—	6	30	51	9.9
Successful Completion, % of Enrolled	39	88.6	—	—	—	—	—	—	5	83.3	45	88.2

Source: ATIM Tracking System

Notes: Collar Counties and Northern Stateline are excluded from the MSSC Quality Practices & Measurement, Manufacturing Process & Production, and Maintenance Awareness training enrollment results because they had no enrollees in the additional MSSC modules. The results from North Central for the MSSC Quality Practices & Measurement, Manufacturing Process & Production, and Maintenance Awareness trainings are suppressed because they consist of fewer than the minimum 3 required participants for inclusion.

Exhibit B-4: Enrollment in and Completion of Additional Occupational Skills Training, by Region

Training Field	Central		Collar Counties		North Central		Northern Stateline		Southwest		Overall	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Machining												
Enrolled, % of ATIM Participants	32	35.6	108	52.9	25	28.4	52	46.4	—	—	219	42.6
Successful Completion, % of Enrolled	28	87.5	94	87	19	76	45	86.5	—	—	187	85.4
Welding												
Enrolled, % of ATIM Participants	11	12.2	33	16.2	27	30.7	30	26.8	—	—	104	20.2
Successful Completion, % of Enrolled	8	72.7	30	90.9	13	48.1	26	86.7	—	—	79	76
Mechatronics												
Enrolled, % of ATIM Participants	—	—	43	21.1	4	4.5	—	—	—	—	48	9.3
Successful Completion, % of Enrolled	—	—	37	86	4	100	—	—	—	—	42	87.5
Logistics												
Enrolled, % of ATIM Participants	—	—	—	—	19	21.6	—	—	—	—	20	3.9
Successful Completion, % of Enrolled	—	—	—	—	3	15.8	—	—	—	—	4	20

Source: Illinois Workforce Development System (IWDS) database

Notes: Northern Stateline and Southwest and Central, Collar Counties, and Southwest regions are respectively excluded from mechatronics and logistics training enrollment results because they did not enroll any participants in training in these fields. Results in machining and welding sectors for the Southwest region, mechatronics for the Central region, and logistics for Northern Stateline are suppressed because they consist of fewer than the minimum 3 required participants for inclusion.

Exhibit B-5: ATIM Participant Time to Training and Program Completion, by Region

Time to Completion and Exit	Median	Standard Deviation	Minimum	Maximum
Time from RA to First Training Completion, in Months				
Central	2.9	3.4	2.5	14.7
Collar Counties	5.3	3.9	1.1	20.2
North Central	4.2	5.2	1.1	23.2
Northern Stateline	3.5	2.0	1.2	13.6
Southwest	12.2	7.3	3.7	23.3
Overall	**4.6**	**4.0**	**1.1**	**23.3**
Time from RA to Program Exit, in Months				
Central	8.0	4.2	1.1	20.0
Collar Counties	9.1	5.5	1.2	26.9
North Central	12.4	5.6	1.0	23.2
Northern Stateline	7.2	4.4	0.7	19.5
Southwest	11.0	6.2	3.0	21.2
Overall	**8.8**	**5.3**	**0.7**	**26.9**

Sources: Illinois Workforce Development System (IWDS) database and ATIM Tracking System

Notes: The training referred to in this table is the additional occupational skills type training described in Exhibit B-4. Start and end dates were not available for the MSSC training modules.

Exit Outcomes by Region for ATIM Participants

Exhibit B-6: ATIM Employment Outcomes by Region

Region	N	Exited with Employment		Training-Related Employment	
		Percent	Count	Percent	Count
Central	90	86%	77	66%	51
Collar Counties	199	75%	149	64%	95
North Central	87	45%	39	54%	21
Northern Stateline	112	71%	80	64%	51
Southwest	17	76%	13	46%	6

Source: ATIM Tracking System

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Appendix C: Methods for Data Analysis

This technical appendix describes the methods and approach used to verify the estimated impacts of the ATIM program. These methods include examination of regression analysis and various statistical approaches conducted as part of a sensitivity analysis not described in the main body of the report. These additional statistical analyses include hierarchical linear modeling (HLM) and adjusting for multiple comparisons. This appendix presents the results of those additional sensitivity analyses.

Statistical Models Used

Study sample members within each of the five regions were randomly assigned to either participate in the program or be part of a control group. Random assignment, by design, enables unbiased estimates of the effects of ATIM on program participants by generating program and control groups that do not systematically differ in any way *except* in their exposure to the program.

To verify that the program and control groups were indeed comparable, sample means for the program and control groups were compared on observable background characteristics measured at baseline (described in more detail in Chapter II). These characteristics included the participant's age, racial and ethnic background, gender, barriers to employment, employment history, and educational attainment. Generally, participants selected into the program group were not statistically different from those in the control group on these background characteristics, with the exception of the two characteristics discussed in Chapter II—with similar equivalence expected for unobserved characteristics as well. Therefore, the difference in means on outcomes is generally expected to produce an unbiased estimate of the treatment effect.

However, there were region-based variations in the probability of assigning study participants to the program group; to account for these variations, the evaluation team applied weights using the inverse of the probability of program assignment to equalize the odds of selection to the respective groups. The weighted adjustment values are listed in Exhibit C-1.

Exhibit C-1: Analytical Weights Applied to Regions

Region	Probability of Selection into Program Group	Weight for Program Group	Probability of Selection into Control Group	Weight for Control Group
Central	0.68	0.7331	0.32	1.5723
Collar Counties	0.69	0.7278	0.31	1.5974
North Central	0.78	0.6418	0.22	2.2624
Northern Stateline	0.65	0.7680	0.35	1.4327
Southwest	0.83	0.6002	0.17	2.9940

Regression Analysis

Regression analysis was used to improve precision of impact estimates through the inclusion of covariates. Including covariates in the analytical model is beneficial to explaining relationships in the data if these covariates are correlated with the outcome. This may increase the model's explanation of variance, thereby reducing unexplained error and improving overall model fit (Gelman & Hill, 2006).

Two types of regression models were used for this study: ordinary least squares (OLS) for outcomes that are continuous, and logistic regressions for outcomes that are dichotomous. Logistic regressions are needed for assessing the binary outcomes of this study because the distribution of errors for these outcome measures follows a binomial distribution and, therefore, violates the distributional assumptions of OLS.

The regression models included a vector of individual-level characteristics, as represented in Equation 1:

$$\mathbf{Y}_n = \beta_0 + \beta_1 Group\ Assignment_n + \Sigma\, \beta_p \mathbf{X}_{pn} + \varepsilon_n \qquad (1)$$

In this equation, β_1 provides the estimated treatment effect of ATIM on outcome **Y**. $\mathbf{X}_p$ represents each of the covariates p with β_p providing the corresponding coefficients for these covariates; the error term (ε) represents the difference between the observed and predicted outcome for person n. Exhibit C-2 details the covariates for the individual-level characteristics included in the regression analysis. Individual-level predictors were collected at baseline and included the person's age, racial or ethnic background, gender, educational attainment, and employment history, among others.

Exhibit C-2: Descriptive Statistics of Individuals' Background Characteristics

Variable	Mean	Standard Error
ATIM program participation	50.0%	2.0%
Male	79.1%	1.7%
Age	40.2	0.5
Minority	38.0%	2.0%
Has at least a H.S. diploma or GED equivalent	56.3%	2.0%
Prior manufacturing-related employment	54.9%	2.0%
Has criminal history	35.0%	1.9%
Timing of RA (late)	50.5%	2.0%
Program Foci		
Machining	26.6%	1.6%
Mechatronics	6.4%	0.9%
Logistics	2.0%	0.4%
Welding	11.6%	1.1%

Source: ATIM application and IWDS database

Note: Estimates were weighted to equalize the odds of selection into the groups. Binary variables are coded 0 if that indicator is not true and 1 if the indicator is true. So, for the binary variables, the mean represents the proportion of the sample with the characteristic. Gender was not provided for three of the 738 participants in the full analytical sample.

Not all baseline characteristics reported in Chapter II were included in the regression analysis. Participants did not vary much in some characteristics, such as prior work experience or disability status. Because including these variables would not increase the explanation of variance in the data or increase model fit, and because the analysis prioritized parsimony in model specification, these covariates were ultimately dropped from the models. Additionally, very few sample members reported any race/ethnicity other than non-Hispanic white, so the covariate included in the regression analysis is only for any minority status, not for individual races or ethnicities.

Hierarchical Linear Modeling

The ATIM program was implemented across five grantees, where program impacts could potentially vary by those regions. For this reason, the evaluation team implemented a HLM approach to account for when errors are correlated within subgroups. HLM takes into account the clustering of data and provides clustered random effects in the estimation, accounting for the nested structure of participants across grantees (Chaplin, 2003).

The intraclass correlation coefficient (ICC) examines how much of the total variance in the outcome measure can be attributed to group identification and is calculated by dividing the group-level variance over the total variance (see Equation 2). Examining a baseline model, with

neither individual nor group-level covariates, a multilevel model would only be required if the ICC was non-trivial (Lee, 2000).

$$ICC = \frac{var(U_{0j})}{var(\varepsilon_{ij}) + var(U_{0j})} \quad (2)$$

In this case, the multilevel model used in this study is represented through the following multilevel equation:

$$\mathbf{Y}_{nj} = \beta_{0j} + \beta_{1j} Group\ Assignment_{nj} + \Sigma\, \beta_{pj} \mathbf{X}_{nj} + \varepsilon_{nj} \quad (3)$$

$$\beta_{pj} = \gamma_{p0} + \Sigma \gamma_{pt} \mathbf{Z}_j + U_{pj}, \text{ for}$$

individual n, site j, covariate p at the individual level, and covariate t at the site level

Equation 3 is identical to Equation 1 but with the addition of a level-2 equation, which allows estimation to vary by site j. The level-2 equation estimates site-level intercept and slopes (β) using site-level covariates (Z_j) and corresponding coefficients (γ_p).

For the ATIM program, participants in the study were selected from five regions. Because the selected participants are clustered within these five regions, the possibility of these clusters correlating with outcomes exists, biasing the estimation of standard errors—typically downward. An HLM approach allows for the examination of potential heterogeneous treatment effects across sites and enables greater precision in estimating the program effect. For the purposes of a sensitivity analysis, the evaluation team estimated the impact of program group assignment using an HLM approach.

Multiple Comparisons

Research that relies on numerous hypotheses tests, such as this study, risks increased probability of falsely rejecting the null hypothesis (a Type I error). This problem is traditionally addressed through adjustments to the significance level needed to reject the null hypothesis (Glickman, Rao, & Schultz, 2014). One method of estimating the multiple comparisons problem is through the familywise error rate (FWER), which calculates the probability of committing at least one Type I error. The commonly-used approach to addressing the FWER is through the Bonferroni correction (Glickman, Rao, & Schultz, 2014), which determines a stricter criterion to reject the null hypothesis based on the number of hypothesis tests conducted. For example, if the *p*-value to reject the null hypothesis is less than 0.10 and hypothesis testing assessed program impacts on two outcomes, the threshold to establish statistical significance, using a Bonferroni correction, is

$$\text{p value} < \frac{0.10}{2} \text{ or } 0.05 \quad (4)$$

However, a FWER adjustment—like the Bonferroni correction—potentially increases the possibility of a Type II error (determining no effect when one exists) when correcting for the occurrence of *any* Type I error. Therefore, a recommended alternative to a FWER adjustment is an adjustment using the false discovery rate (FDR). Unlike the FWER, the FDR is the expected proportion of Type I errors among the significant findings *only*. One approach to control for the FDR is the Benjamini-Hochberg procedure, which determines statistical significance when

$$p\text{-value} < \frac{i}{M} * (0.10), \text{ where} \quad (5)$$

$$i = \text{ordered rank of unadjusted } p\text{-values}$$

$$M = \text{number of all significant findings}$$

The FDR provides a less stringent control of Type I errors compared to FWER and, subsequently, is less likely to generate Type II errors through correction.

Results of the Sensitivity Analysis

The sensitivity analysis utilized regression analysis, HLM, and the Benjamini-Hochberg procedure to assess the robustness of the results presented in Chapters III and IV. The evaluation team ran each of these three models for these five key measures:

1. Average number of certificates earned
2. Employed at any time in the first and second year following random assignment
3. Total earnings in the first and second year following random assignment

The results of the impact analysis showed positive impacts on certificates earned as well as employment and total earnings in the second year following random assignment through ATIM participation.

Exhibit C-3 compares four different ways of estimating the impacts of the ATIM program on the credential and employment outcomes discussed in Chapters III and IV.

- Model 1: Regression analysis of the outcome variables regressed on the group assignment (a baseline model).
- Model 2: Adjusted statistical significance of Model 1 using the Benjamini-Hochberg correction.
- Model 3: Regression analysis with inclusion of the control variables listed in Exhibit C-2. The results are adjusted using the Bonferroni correction.
- Model 4: HLM with inclusion of the same set of control variables. The results are adjusted using the Bonferroni correction.

For all four models, consistent with Chapter IV, the sensitivity analysis relied on weight-adjusted data.

The ICCs were assessed to determine the need for utilizing a multilevel model. Generally, the ICCs were considered trivial. As revealed in Exhibit C-3, credential attainment was generally robust to model specification, with the exception of the multi-level approach. ATIM impacts on credential attainment as well as earnings in the second year after random assignment were robust to model specification. However, the inclusion of covariates as well as a multilevel framework did alter the significance levels slightly for earnings in the first year of random assignment—though the direction of program impacts remained unchanged. This supports

earlier findings that ATIM may impact particular subgroups more than others in the short-term and, a larger sample size permitting, a program evaluation further exploring key subgroups would be informative to policymakers.

Exhibit C-3: Employment Impacts

Impacts	Baseline	Benjamini-Hochberg Adjustment ($\frac{i}{M}\alpha$)	Regression with Covariates	HLM with Covariates
Average number of certificates earned	2.0***	2.0†	1.4†	1.4†
Employment				
1st Year after RA	0.1	0.1	0.2	0.3
2nd Year after RA	0.4*	0.4†	0.3	0.3
Earnings				
1st Year after RA	-$230.64	-$230.64	$1,882.06	$2,525.76
2nd Year after RA	$4,334.05*	$4,334.05†	$5,475.61†	$6,977.61†

Source: IDES wage data

Notes: Estimates were weighted to equalize the odds of selection into the groups. The estimates in the first column represent the impact of the program, excluding covariates. The second column adjusts the significance of the baseline results, using the Benjamini-Hochberg procedure. The third column is a replication of group differences using regression models, with the inclusion of covariates, alongside the multiple comparisons adjustment. Lastly, the fourth column replicates model 3, including the multiple comparisons adjustment, through a hierarchical linear model (HLM).

*/**/*** Statistically significant at the .1/.05/.01 level.

†Statistically significant following Benjamini-Hochberg adjustment.