JULY 2020

State-level policies to incentivize workplace learning: Impacts of California's incumbent worker training program

Marian Negoita
Social Policy Research Associates

Annelies Goger
Brookings Institution

Economic Studies at BROOKINGS

Abstract

The inability of labor markets to function effectively to satisfy the needs of employers and workers suggests that there is a growing need for policy interventions to promote workplace cultures of learning and innovation. Past research suggests that incumbent worker training programs may have a positive impact on an array of company-level outcomes, such as number of workers and labor productivity, and employee-level outcomes such as earnings. However, these studies were conducted more than a decade ago, in labor markets that were very different from what companies experience today. This paper examines the impact of a state program in California that uses a pay-for-performance approach to reimburse employers that train their employees – the California Employment Training Panel (ETP). Based on a mixed-method study of ETP, we found that, overall, ETP had positive and significant impacts on company sales and firm size. We also found variations in impact by company size, age of the company, and industry sector. The study's findings suggest that it is important to reduce administrative burdens associated with program participation and that services may need to be tailored differently for small, medium, and large companies.

Keywords: workforce development, job training, future of work, state policy, work-based learning, California

Introduction

Employers in the United States express growing concerns about skills shortages, especially in middle-market employers, digital skills, and for employability skills such as problem solving and critical thinking (Stewart, et al 2017; Deloitte and The Manufacturing Institute, 2018). In addition, firms tend to underinvest in worker training because of high employee turnover and the fear that trained employees would be "poached" by other companies (Lynch, 1992; Bishop, 1995). At the same time, labor markets have become increasingly precarious for workers in the US, who are contending with wage stagnation, labor market polarization (declining middle-skill occupation employment), expansion of low-wage jobs, the "fissuring" of work arrangements, and declining access to employer-provided benefits for low-wage workers (Howell and Kalleberg, 2019; Acemoglu and Autor, 2011; Weil, 2014). The inability of labor markets to function effectively to satisfy the needs of both employers and workers suggests market failures are occurring and that there is a growing need for policy intervention. Policymakers worldwide are also concerned about how new technologies such as automation and artificial intelligence will continue to transform and disrupt the nature of work, which they anticipate will require countries to reorient their education and training systems to facilitate lifelong learning and more agile firms and workers in the future (World Economic Forum, 2017).

Research on publicly funded incumbent worker training has been very limited in scope. Hollenbeck (2008) produced a detailed survey of state-funded programs, and Moore et al. (2003) and Hollenbeck & Klerk (2007) estimated the impact of state-level programs from California and Massachusetts on company-level outcomes. In general, past research suggests that incumbent worker training programs may have a positive impact on an array of company-level outcomes, such as number of workers and labor productivity, and employee-level outcomes such as earnings. However, these studies were conducted more than a decade ago, in labor markets that were very different from what companies experience today.

This paper examines the impact of a state program that funds employers to train their employees – the California Employment Training Panel (ETP). Created through state legislation in 1982, ETP reimburses employers that invest in approved training. The program draws on funds from an employer tax collected alongside state unemployment insurance taxes and through other sources of state funding to support special training initiatives.

The founding purpose of ETP was to retain businesses and jobs in the state, increase the competitiveness of companies in California, and enhance workforce skills. ETP is governed by an eight-member Panel that has representation from labor, business management, and state government. ETP prioritizes approving applications for training funds that align with statewide priorities and special initiatives, such as training in priority industries and training for veterans, youth with disabilities, and small businesses in areas with high unemployment.

In 2017, ETP contracted with Social Policy Research Associates (SPR) to conduct a mixed-methods study of the program, meeting a requirement for periodic third-party program evaluation in the ETP legislation. The study examined how employers and workers were benefitting from ETP investments, how ETP could promote continuous improvement, and how it could be updated to reflect current training needs, training delivery methods, and economic trends. The study included:

- **Qualitative interviews**: 23 semi-structured interviews with key informants, such as staff, intermediaries, employers, and labor organizations to understand how ETP is administered and gather qualitative information relevant to the research questions;

- **An employer survey**: a survey of 673 employers participating in ETP about their training practices, skill needs, and partnerships; and

- **Quantitative analysis**: an outcomes study of ETP administrative data and a quasi-experimental impact study at the firm level to understand the effects of the program on company sales and employment.

This paper summarizes key findings from this study. We begin by presenting background information about ETP and describing the characteristics of ETP-funded employers. Next, we present the main findings from key informant interviews and the employer survey. Lastly, the paper summarizes findings from a

quasi-experimental impact analysis of ETP training investments. In the concluding section, we draw out the main implications of the study and discuss policy recommendations. Throughout the study, California's economy was very strong and labor markets were tight, so the results should be interpreted in that context.

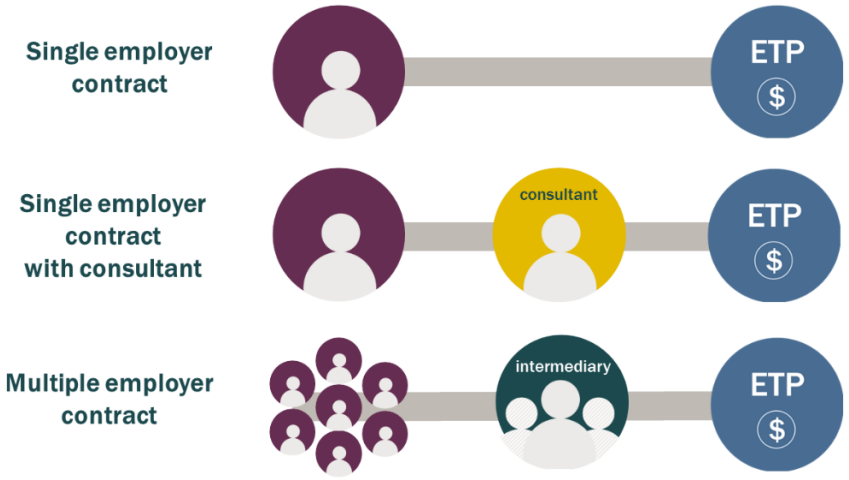
Background

ETP legislation allows considerable discretion to the eight-member Panel and Executive Director to implement the program and establish rules about what types of training are eligible for reimbursement, the rates of reimbursement, and the manner in which employers are required to document training. Under current rules, employers, worker representatives, and third-party consultants or intermediaries can apply for ETP funding through two main contracting mechanisms:

- **Single-employer contracts**: An individual employer applies for funds independently or with the help of a third-party consultant.

- **Multiple-employer contracts**: A third party—typically an industry association, community college, labor organization, workforce board, or similar intermediary—receives a master contract it can administer to multiple employers in smaller amounts.

Figure 1: Three options for structuring ETP contracts



ETP provides employers flexibility to choose the training providers they want and, to some extent, to choose the type of training – although the eligibility rules and reimbursement rates vary. ETP allows employers to be reimbursed for

classroom-based training, training off-site (e.g., at a community college or third-party provider), online training, and on-the-job training.[1]

The administrative process for single-employer applicants includes the initial application, contract drafting and approval, monitoring and reporting, and reimbursement. Users initially apply for ETP online, and then an ETP field staff member will assist them with the full application, which was paper based at the time of our data collection. The application requires that the user document the training plan, a justification, and the expected wage increment, among other things. Because the process is complex and it can be difficult to interpret how the program's rules apply to a specific company's application, many single-employer applicants hire third-party consultants who are familiar with the program for assistance.

Applications for multiple-employer contracts are managed through the same basic process, but the applicant is a third-party (herein referred to as an "intermediary") – such as an industry association, community college, labor organization, Joint Apprenticeship Training Council (JATC), or workforce development board. The intermediaries then either subcontract to employers in smaller amounts (providing easier access for small and mid-sized employers) or provide training directly through an apprenticeship program with apprentices who are also employed.

Once the contract is approved, users submit a list of trainees and then submit weekly reports to document training hours completed, which can be done in original hard copy or electronically with an approved learning management system. Typically, each contract covers a period of 1.5 to 2 years, and many companies have returned for additional contracts once the first contract was completed. ETP was upgrading its information systems to migrate more of the process online and make it more user driven.

Funding for ETP programs is disbursed based on a pay-for-performance model, meaning that employers do not receive funding until they demonstrate successful performance. Performance is assessed through completion of training hours, completion of all planned training, and retention in employment at a well-paying wage rate[2] after 90 days from the completion of training.

Characteristics of ETP-funded employers

ETP approved an average of 388 new contracts for training each year, with an average value of $208,165 per contract (ETP annual reports, 2012-2017). ETP approved new contracts totaling an average of $80.7 million per year (ibid.). The number of approved trainees varied widely from year-to-year, but it increased from roughly 62,000 in 2012–2013 to over 100,000 in 2016–2017—a trend associated with

[1] We use the terms "online training" and "on-the-job" training instead of ETP's terms of "computer-based training" and "productive lab," respectively, to make the language more accessible to a wide audience. The generic use of "On-the-job training" in this paper (meaning learning that takes place as an individual is engaged in productive work activities) should not be confused with the technical definition of "on-the-job training" in the Workforce Innovation and Opportunity Act.

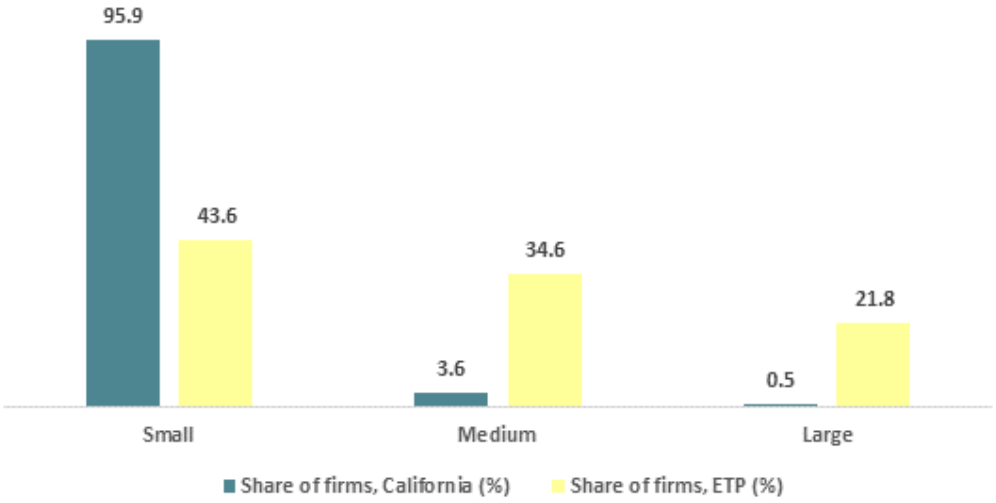
[2] The wage rates for meeting performance goals are specified in each contract before approval.

a significant increase in the total funding for approved contracts (ibid.). According to ETP administrative data, the multiple-employer contract structure enables more companies access to ETP funds, but the share of funds approved for those contracts was much lower. Ninety percent of companies receiving ETP funds used multiple-employer contracts to do so from 2014 to 2016 (ibid.). However, ETP administered two-thirds of approved funding (by value) to companies through single-employer contracts (ibid.).

The types of companies that participate in ETP through multiple-employer contracts are qualitatively different from those that participate through single-employer contracts. Companies accessing ETP through single-employer contracts tended to be larger (about half had 250 employees or more). Almost half were in the manufacturing sector, followed by technical services (10.2 percent) and wholesale distribution (9.1 percent). Employers participating in ETP through multiple-employer contracts, on the other hand, tended to be smaller (fewer than a quarter had 250 employees or more), and roughly half were in construction. This is because many multiple-employer contracts were operated by labor unions or JATCs in the building trades.[3]

Between 2014 and 2016, a total of 2,173 companies were funded by ETP. In these years, 22 percent of ETP participating companies were large, 35 percent were mid-sized, and 44 percent were small companies (administrative data, 2014-2016).[4] This distribution of approved funding by company size is skewed in a direction that is opposite to how companies are distributed in California generally (Figure 2).

Figure 2: Distribution of ETP companies by company size versus the size distribution of companies in California



[3] The number of companies that participate in each multiple-employer contract varied widely.
[4] ETP administrative data, 2014–2016.

Sources: ETP administrative data for completed contracts, 2014-2016, and State of California Employment Development Department: Size of Business Data for California, 2015 Q1.

Although more of ETP's contracts were concentrated in the construction industry, the highest share of the funding went to the manufacturing sector (ETP annual reports, 2012-2017).[5] On average, from 2012 to 2017, ETP approved 40 percent of new core funding for contracts in the manufacturing industry, distantly followed by construction (15 percent), high-tech and technical services (12 percent), and healthcare (10 percent) (ibid.).

Women were underrepresented among ETP trainees; on average, nearly two-thirds of the incumbent workers trained through ETP-funded programs were men (ETP annual reports, 2012-2017). This was likely because the industries and sectors in which many ETP-funded companies had operated in recent years, such as manufacturing and construction, tended to have a disproportionately male workforce. In 2012–2013, ETP funded a higher share of training in healthcare, which has a female-dominated workforce. In that year, the share of women receiving ETP-funded training increased to 44 percent.

Findings from key informant interviews and the employer survey

Employers and labor organizations ("users") reported many benefits to ETP participation. They said ETP funding helped them retain and motivate their workforce, establish or update internal human resources training systems, stay competitive by keeping their employees updated on the latest technologies, maintain more rigorous quality control processes, and train workers on new equipment or technology during major upgrades or expansions. Survey respondents provided many open-ended comments on how ETP involvement helped the company. Numerous respondents noted that ETP's support put "training in the forefront for our organization." This focus on training included getting buy-in from senior leadership about training needs, providing trainings that had been put off in prior years, and simply "help[ing] make training consistent." Employers also described benefits to employees, including increasing the self-confidence and self-esteem of employees who received training, improving morale, and developing leadership skills of staff.

In the survey, large and midsized ETP-participating companies reported offering more training in all content areas than small companies. For example, 55 percent of large companies and 48 percent of midsized companies reported offering basic computer skills training. In contrast, only about a third of small companies provided such training.[6] Similarly, 72 percent of large companies and 65 percent of

---

[5] The discrepancy is due to the fact that more companies participate in ETP through a multiple-employer contract (predominantly in construction), but more funding is approved through single-employer contracts, which is concentrated in the manufacturing sector.

[6] Note: To minimize the effects of nonresponse bias, all survey findings reported in this paper were weighted. Nonresponse weights were created using an iterative proportional fitting algorithm that

midsized companies said that they provided soft skills training compared with slightly over half of small companies. Since it is not feasible to assume that small companies need less training (and, in fact, there are many reasons to believe that they may need more), these findings suggest that small companies may underinvest in training, potentially due to resource constraints. This finding is consistent with previous research showing that use of training varies systematically by employer size,[8] and therefore, suggests that small companies may have a greater need for support with incumbent worker training compared to midsized and large companies.

In interviews, small and mid-sized employers tended to report a greater impact of ETP funding. They said that ETP helped them formalize internal training systems and facilitating expansion. These employers also reported more observable outcomes from the use of ETP funds, such as adding more employees and increasing revenue. Large firms reported typically using ETP to supplement existing training, retain workers, and adapt to new technologies.

In the interviews and survey, informants reported that ETP's administrative processes and information systems were overly cumbersome. In particular, eligibility, reporting requirements, and reimbursement rates were confusing to users and could be a barrier to access. Interview informants noted that administrative processes had become more efficient and flexible in recent years.

Overall, the qualitative and survey components of the study suggest that ETP provides a significant level of support to employers for incumbent worker training – especially in the manufacturing and building trades sectors of California's economy. The companies that participate in ETP tended to be larger and have a more male-dominated workforce compared to all workers and companies in California – most likely due to the cost and risk associated with participating given the program structure and processes (administrative cost and funding risk due to the reimbursement model) and due to occupational segregation in the sectors that participate most heavily. Users of the program reported a wide range of benefits from participating, such as building internal learning infrastructure and retaining and motivating existing workers. The next section summarizes the results from a quasi-experimental impact analysis on sales and company size.

Impact Study

As described above, employers, staff, and intermediaries that administered ETP funds generally perceived that ETP was valuable. The impact analysis tested whether these perceived benefits could be measured quantitatively, if they held true more broadly across a larger number of firms that received ETP funds, and

---

performs a stepwise adjustment of survey sampling weights to achieve known population margins. The adjustment process is repeated until the difference between the weighted margins of the variables and the population margins are deemed sufficiently close. More details are available in González, et al., 2020. *Survey Issue Brief: California Employer Training Needs*. Oakland, CA: Social Policy Research Associates on behalf of the California Employment Training Panel.

estimated the size and consistency of the impact for different types of firms. To do this, we conducted a quasi-experimental impact analysis of ETP training investments. In a quasi-experimental study, a comparison group is selected purposefully from available data sources such that it resembles the program (treatment) group as closely as possible. The comparison group serves as an estimation of what would have happened in the absence of the program (otherwise known as the counterfactual). The difference between the average outcomes in the two groups represents the program's average impact (the gains experienced by participants compared to a hypothetical status quo in which the program was not available).

Generally, investments in incumbent worker training are expected to generate several types of company-level improvements. Improved efficiency and quality/accuracy of the labor force are expected to increase labor productivity, and increased employee skills and knowledge are expected to increase competitiveness (Moore et al., 2003; Hollenbeck, 2008). Both increased productivity and competitiveness might then be expected to result in higher revenue. In addition, incumbent worker training might be expected to create new jobs or to save jobs from being eliminated (Hollenbeck, 2008), which can be expected to result in a larger number of employees. Based on these insights from the literature, we chose company size and sales as our main outcomes to estimate ETP's impact on companies.

We used a propensity score matching methodology to compare the outcomes of a sample of companies that were funded by ETP in the 2017-2018 program year (the treatment group) with the outcomes of a comparison group of similar companies that did not receive ETP funding. We used data provided by Dun & Bradstreet (henceforth D&B) to select the comparison group. D&B owns a large proprietary database that maintains records of more than 265 million companies with 30,000 global data sources, which is updated frequently. SPR acquired data from D&B for a random sample of the companies that were funded by ETP during the 2017-2018 program year (n=1,000), and a comparison pool of 3,000 companies that were not funded by ETP during the 2017-2018 program year. For each company, we obtained data on company-level outcomes (company size and yearly sales) and company-level characteristics such as industry code, geographic location, and the year of funding for several years before participation (2013, 2014, and 2015) and at two years after participation (2019).[7]

Findings

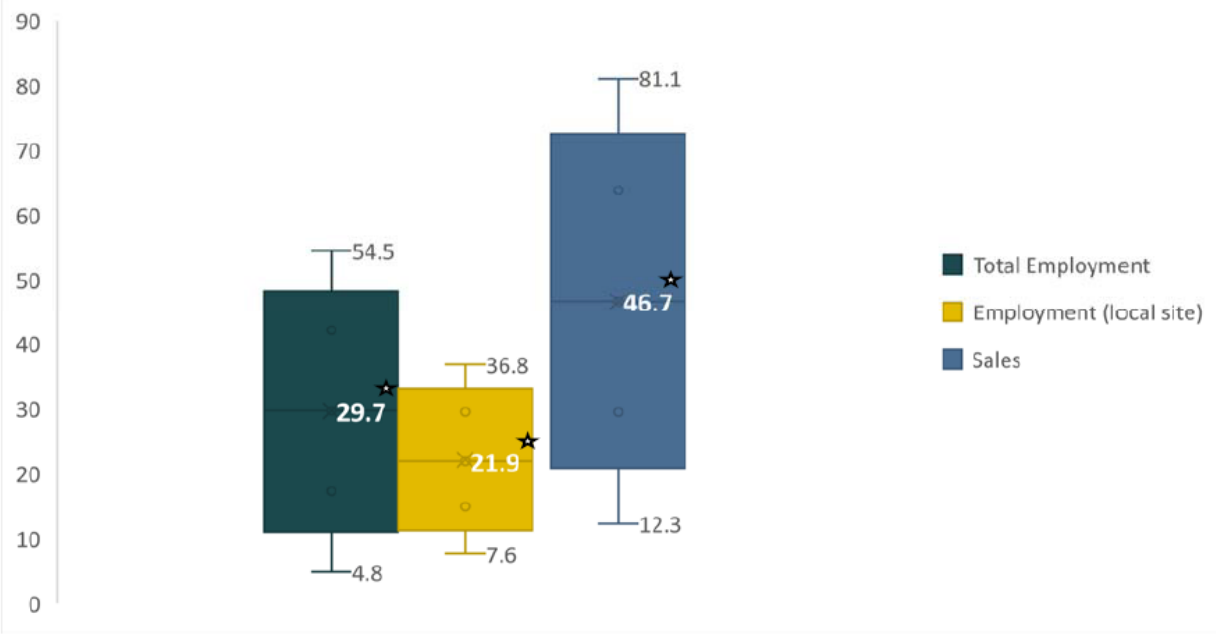
The results suggest that ETP-funded companies had, on average, more employees than a matched sample of comparison companies that were not funded

[7] A particularity of D&B data is that certain data fields (especially important outcomes such as employment and sales) are given as either actual (measured) or estimated using D&B's own proprietary methods. Using imputed data increases the possibility of measurement error. In addition, we were only able to analyze the impacts of ETP funding on two specific outcomes—firm size and sales—as D&B data do not include other important potential company-level outcomes such as labor turnover, innovation outcomes, and profitability.

by ETP. Specifically, ETP companies had, on average, 22 percent more employees at the funding site two years after receiving ETP training funds, a result that was statistically significant (Figure 3). Given the variability of the impact estimate, however, the impact of ETP might be expected to vary between eight and 37 percent, as suggested by the 95% percent confidence interval. In addition, our analysis indicated that ETP-funded companies had a statistically significant 30 percent more employees overall, although there was more variation in this outcome, making the estimate less precise. As shown in Figure 3, ETP also appeared to have a statistically significant overall positive effect on company sales (47 percent), with the true impact estimated to vary between 12 and 81 percent. This finding suggests that ETP funding may have improved labor productivity and competitiveness, leading to an increase in revenue.

Figure 3 summarizes the results of the impact analysis of ETP funding on all firms. It shows both impact estimates (shown in the middle of each bar) and the 95 percent confidence intervals (which represent the range within which the "true" impact estimates are predicted to lie with 95 percent certainty) shown as whiskers at the end of each bar. The impact estimates are an average prediction of impact, while the confidence intervals convey how much variation there was in impact estimates for the respective group.

Figure 3: Estimates of ETP Impact on Number of Employees (Firm Size) and Sales



Source: Dun & Bradstreet (2019). *Note:* The stars denote statistical significance at the 95% level.

The overall impact estimates provide compelling evidence that state investments in incumbent worker training benefit both firms and workers in terms of increased jobs and revenue. These findings are also consistent with previous impact findings from an earlier study (Moore et al., 2004)[8] and more generally insights from the literature that incumbent worker training programs have the potential to help firms by helping create new jobs or to saving jobs from being eliminated.

Does the Impact of ETP Vary for Different Types of Companies?

To provide additional insights into how ETP supports companies and workers, we also analyzed impacts for certain types of companies. This section examines the impacts of ETP by company size, the age of the company, and industrial sector.

Impacts of ETP Funding by Company Size

We compared the impacts of ETP by firm size to investigate whether the ETP affected small, medium, and large companies differently. To control for year-to-year fluctuations, we calculated, for each company, its average size recorded in 2013, 2014, and 2015. We divided the sample into four subgroups of roughly equal proportion[9] based on this average size and conducted an impact analysis for each subgroup.

The results are displayed in Figure 4 and show that, indeed, ETP seems to have a very different effect on companies depending on their size.[10] We obtained negative impact estimates for the smallest companies (1-18 employees) in terms of employment and sales, although the finding on the impact on sales was not statistically significant. By contrast, companies in the next size bracket (19-50 employees) appeared to experience large and positive impacts on both outcomes, with each hovering around 40 percent. The positive impacts persisted for the next larger size category (51-100 employees), although they decreased in size compared to the previous bracket. Finally, the impacts for the largest category were small and not statistically significant.

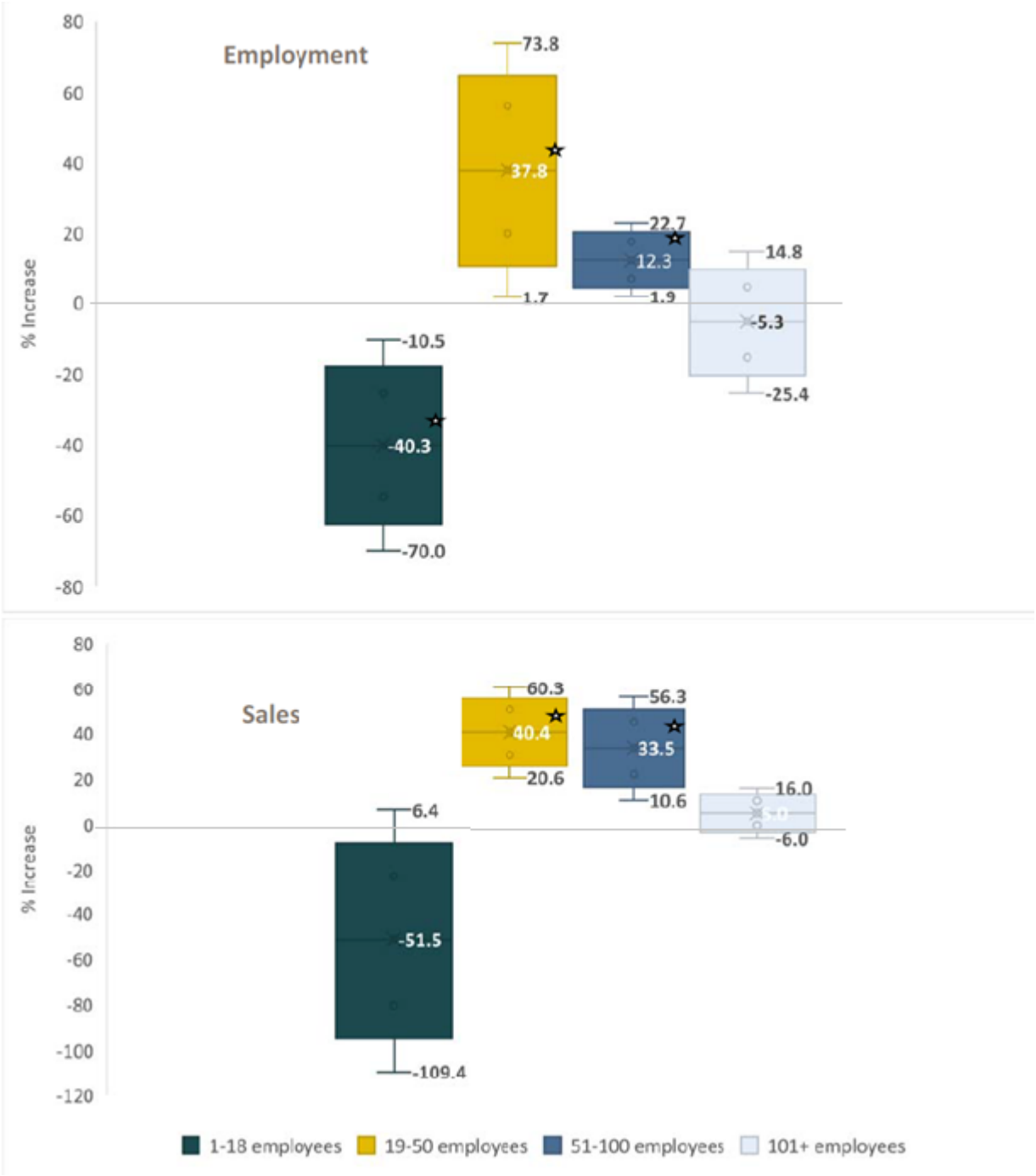
---

[8] Moore et al. (2004) estimated the impact of ETP on employment at approximately 15 percent. However, their methodology was different from the one used in this study and therefore the estimates are not directly comparable.

[9] We chose four groups as opposed to a lower or higher number because this strategy yielded the highest number of groups with a sample size that was large enough to analyze.

[10] We use different groupings than those used earlier in the paper because the earlier groupings would have resulted in unbalanced groups in terms of size.

Figure 4: ETP Impacts by Company Size



Source: Dun & Bradstreet, 2019. Note: The stars denote statistical significance at the 95% level.

These results suggest that ETP participation has its most strong and significant effect on companies that have between 19 and 100 employees—an encouraging result given that almost half of all ETP companies with non-missing employment data were in that range. This finding is consistent with insights

previously obtained from qualitative interviews, which suggested that ETP participation tends to have a particularly strong organizational effect on small and mid-sized companies as it frequently caused them to boost their internal training systems as they entered a growth spurt.

The negative effects of ETP participation on employment and sales of very small companies with 18 employees or less are concerning. These companies make up almost a quarter of the ETP companies with non-missing employment data, and the trend appears to be consistent across the industry sectors analyzed. However, these findings may help explain the survey finding that small employers tend to underinvest in training compared to midsized and large firms. It is possible that very small employers struggle to have the organizational capacity to train employees or to participate in ETP effectively, at least in the short run (i.e., within two years). For example, the administrative structure for participating in ETP (such as the pay-for-performance structure that requires employers to invest in training upfront and then wait for reimbursement) may put very small firms in an unstable position compared to larger firms that have a greater ability to absorb the risk or cost of participating.

The relatively small impact of ETP on the size or sales of large companies is not very surprising, based on our qualitative evidence that ETP was just one funding source of many funding sources available for training at large firms. In interviews, representatives from large firms said it was difficult to isolate the effects of ETP funding from other investments they were making in training. The employer survey also confirmed that large employers were much more likely to provide training to their employees than small employers (Gonzalez et al., 2019).

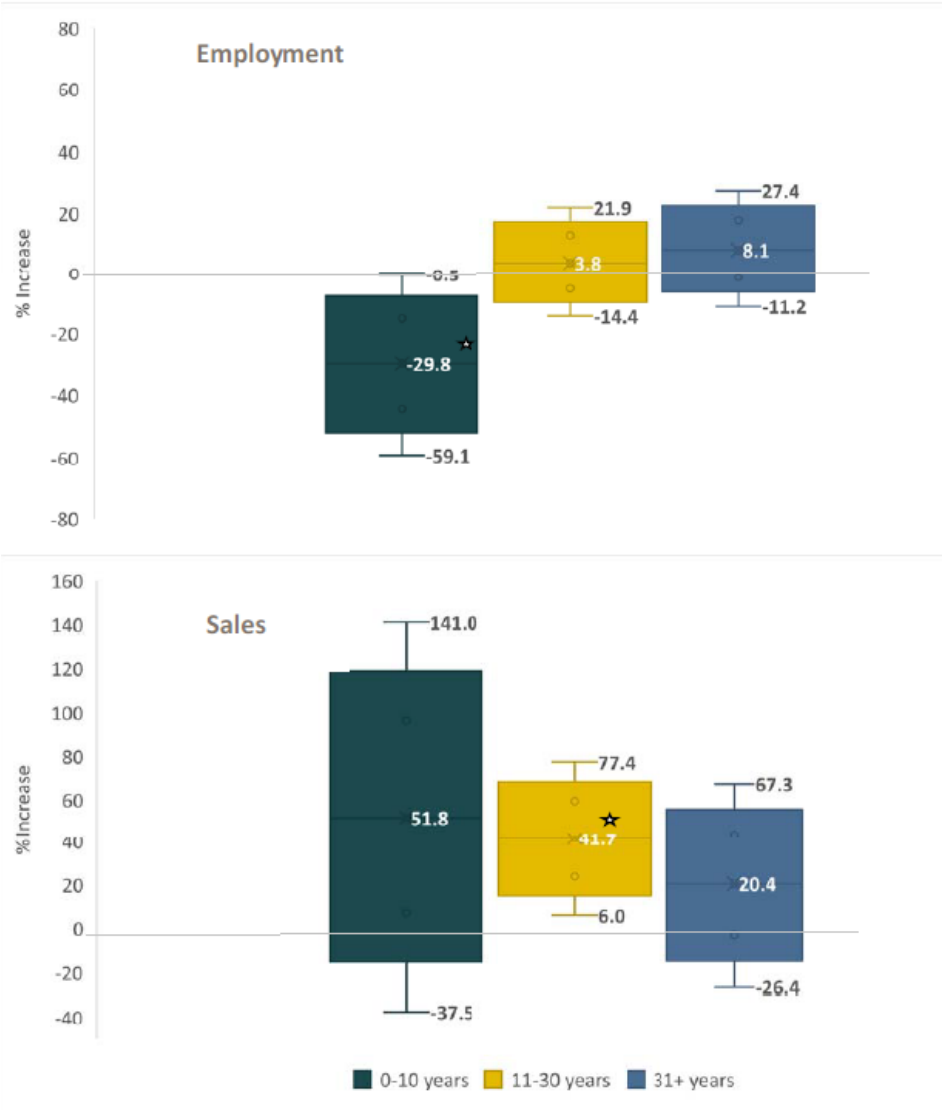
Impacts of ETP by Age of the Company

Another relevant dimension of variation for companies is their age—the number of years they have been in operation. An argument could be made that young companies (which include startups and companies that were founded recently) may have a considerable need for training, and a willingness to explore new areas, which would lead to a positive impact of training. However, young companies may not yet have defined priorities for training or established training systems, which may cause them to not invest optimally in training and therefore not benefit from it. More established companies can be expected to be more likely to possess adequate training systems, so they might be able to utilize the training to a larger extent. However, it is possible that these kinds of firms may have less of a need to access training given the availability of internal resources for training, which may lead to an insignificant impact of ETP training. We divided companies into three groups: young (0-10 years since establishment, as measured in 2017); relatively well established (between 11-30 years of age) and well-established (31 years or older).

The findings of the impact analysis by company age are shown in Figure 5. Most of the impact estimates were not statistically significant and were therefore inconclusive. However, ETP participation appeared to be associated with a

statistically significant decrease in employment for young companies, which appears to support the view that insufficiently developed training systems make young companies less likely to reap the benefits of training. Although only 16 percent of the companies served by ETP fell in this category, this finding suggests that young companies may be faced with similar circumstances that very small companies experience (in fact, the average size of young companies was much lower than that of older companies). Together with small companies, therefore, young companies may represent an important area for additional research that might illuminate the specific needs of these groups and might suggest additional strategies and policies that ETP can enact to boost the impact of training for these companies.

Figure 5: ETP Impacts by Company Age



*S*ource: Dun & Bradstreet, 2019. Note: The stars denote statistical significance at the 95% level.

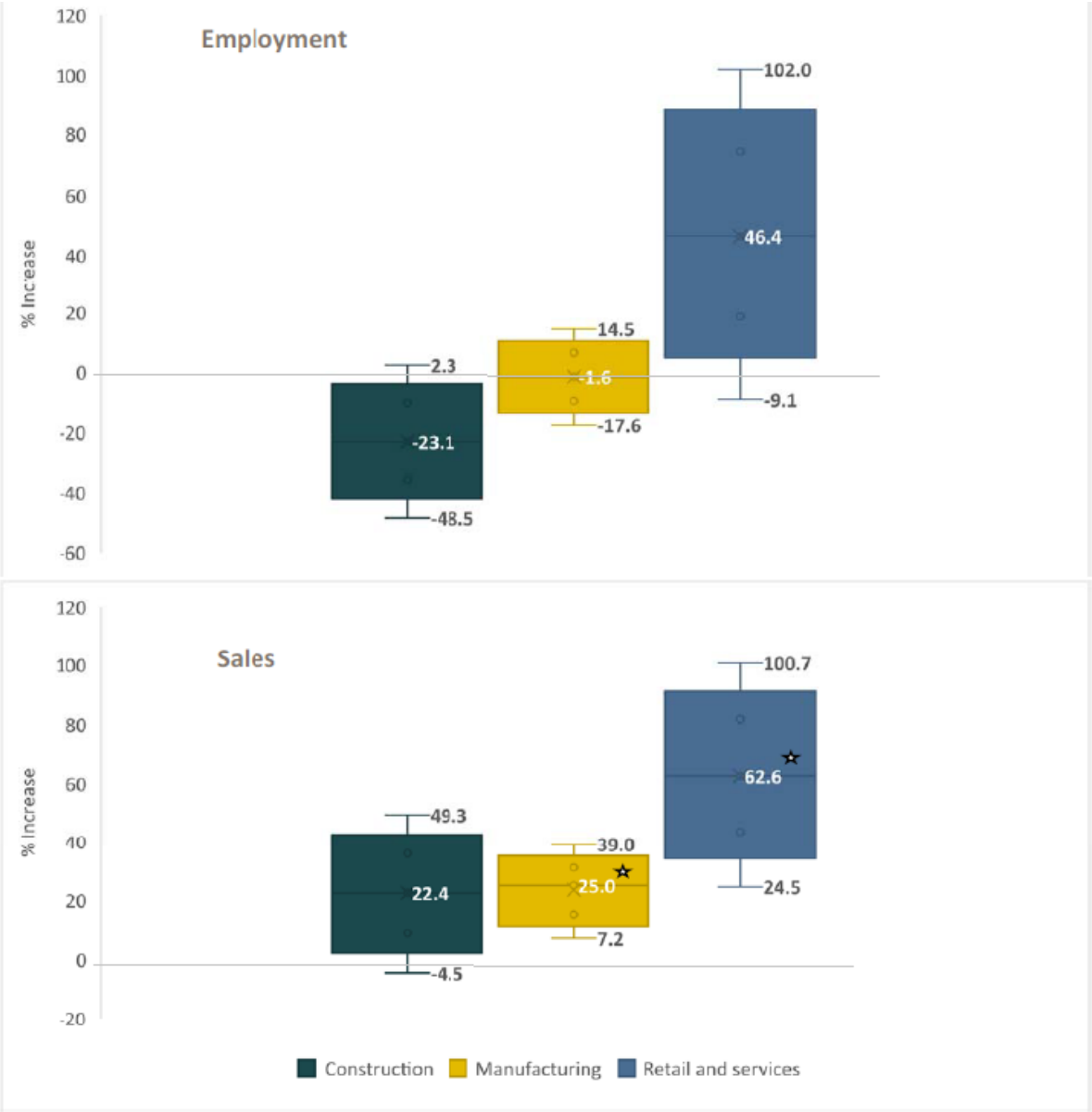
Participating in the program appeared to be associated with a significant boost in sales for relatively well-established companies (between 11 and 30 years of age). This finding reinforced the sense that ETP participation may be especially impactful for companies that fall in a "sweet spot"—both from the perspective of size and age. This category appears to include companies that are mature enough to have developed a training infrastructure, but which also may significantly underinvest in training. As in the case of size, further research may illuminate the processes that are involved in accessing training as companies age and may provide a more complete picture.

Impacts of ETP by Industrial Sector

Lastly, we examined impacts by industrial sector using Standard Industry Classification (SIC) codes. There is evidence that firms from some industrial sectors, particularly construction, tend to underinvest in training (Frazis, Herz, & Corrigan, 1995). Given the relatively small size of the sample, we opted for inclusive classification categories ("divisions" in SIC parlance). Even with this strategy, not all major industrial groups had sufficient sample size. As a result, the only industrial classifications that could be adequately analyzed were construction, manufacturing, and retail and services (combined).

Our analysis (shown in Figure 6) did not find any statistically significant impacts of ETP funding on employment growth. It appeared, however, that ETP's impact on sales for all types of companies was positive, although only the estimates for manufacturing and retail/services companies were statistically significant. Overall, therefore, there is encouraging evidence that ETP has a positive effect on sales for companies from manufacturing and retail/services sectors, whereas the evidence on employment was inconclusive.

Figure 6: ETP Impacts by Industrial Sector



Source: Dun & Bradstreet, 2019. Note: the stars denote statistical significance at the 95% level.

Conclusions and Policy Implications

As the pace of deployment of new technologies in the workplace increases, the findings from this study can shed light on the potential role that states and governments can play to incentivize more private investment in workforce training. Fostering a culture of ongoing learning in the modern workplace provides workers with more opportunities for career advancement and better wages, and benefits companies by enabling them to stay competitive and innovative. Overall, this research supports the hypothesis that public investments in incumbent worker training can help address market failures that result from employers underinvesting in employee training. ETP funding had a large and positive impact on company sales and employment, both overall and for some subgroups. The most precise estimate of overall impacts suggests that ETP funding increased jobs at the work site by 22 percent after two years, suggesting that the program benefits both companies and workers through either job creation or preventing job loss.

ETP had the strongest impacts on companies that were more than 10 years old (long enough to have established internal infrastructure and pathways for learning) and that were small or midsized businesses with between 19 and 100 employees. These findings suggest, more broadly, that this program model appears to work especially well for companies with those characteristics. Other states may want to consider using or adapting a similar program model with companies that fit this general profile and prioritize them for public investments due to their potential for job creation, job preservation, competitiveness, and productivity.

This study also found that ETP funding had negative impacts on businesses with less than 18 people and young companies, and that small businesses were likely to invest the least in training overall. These findings suggest a need for state policymakers to better understand the types of support that small and young businesses need most and pilot ways to make programs such as ETP more accessible than it currently is for these companies from a cost and risk perspective.

The estimated impacts of ETP-funded training on companies with 101 employees were not statistically significant, and the confidence interval suggests that even if they were positive in reality, they would be small (see Figure 4). Coupled with the fact that large companies already invest more in training compared to other types of companies, this raises the question of whether supporting very large firms is a judicious way to spend public money. A case could be made that allocating a greater share of the funding to small and medium companies not only places public funds into entities that are more likely to see greater impacts, but would also seem to contribute to a greater diversity (and viability) of local and regional economies, which is sorely needed to withstand shocks such the one recently brought on by the Covid-19 pandemic.

The impact analysis presented in this section has several limitations. First, although the comparison pool of companies received from D&B was three times as large as the treatment sample, which in theory should be sufficient to ensure high-quality matches, there were large initial imbalances between the two groups in

terms of baseline average employment and sales (the ETP group had much higher average numbers of employees and sales). As a result, achieving covariate balance, especially for small subgroups, proved challenging. Although all analyses presented in this chapter ultimately achieved good covariate balance,[11] this was sometimes accomplished by removing outliers (typically, ETP companies with very large values) from the analysis. Subsequent research that utilizes larger samples of both ETP and comparison companies might be able to offer a more precise estimation.

Overall, although these analyses are limited, they clearly suggest a strong potential impact of ETP funding, particularly for certain types of firms, and suggest potentially important policy implications. Our study suggests the following policy recommendations:

- State incumbent worker training programs can reach a more representative group of employers and trainees by enhancing outreach to small and midsized employers and employers in industry sectors that have more female workers, as many employers are not aware of ETP or clear about eligibility for and use of ETP funds.

- Reviewing and updating state regulations can help support programs in their efforts to streamline processes, align the program with current employer needs and training delivery methods, and communicate the rules effectively to employers.

- Consider establishing a separate set of rules, administrative processes, and funding structures for companies of different sizes. We found that large companies had different training needs compared to small and mid-sized companies, and that small and mid-sized companies tended to report greater impacts of ETP on their company overall. While the pay-for-performance structure appears to be working fine for most companies, the risk involved may limit the ability of very small firms to access funding, as suggested by the negative impacts calculated for these companies in the impact study. Taken together, these findings seem to justify developing a new set of rules and program structures that is more suitable for micro-enterprises and very young companies, while continuing with this model for businesses that are larger and more established.

- Enhance services to create a centralized customer service access point for employers to find information about publicly funded programs that are available to support their training needs and resources or technical advice about how to establish internal career ladders, mentoring, and other learning infrastructure to offer quality training. Employers and intermediaries who work with many employers throughout the state expressed that employers find the public workforce system very confusing to navigate, and that it is

[11] Covariate balance is the ability to match treatment and comparison groups very closely on pre-intervention characteristics.

difficult to tell what resources are available. Interviews with small and mid-sized companies suggested that employers might even be willing to pay for more assistance from ETP in dealing with these challenges and in trying to establish a more sophisticated system for continuous learning in their company. Although they reported relying on industry associations to some extent, these companies communicated a need for more detailed guidance on government services and assistance with how to improve internal training infrastructure.

In addition to the specific recommendations for California's program above, the evidence from this study is promising for further research. First, it appears that there is also a need to pilot and evaluate alternative approaches for meeting the training needs of young and very small businesses, such as approaches of collectively pooling training costs through shared training centers, apprenticeship program supports, or business incubator programs. Second, more research can be conducted at the training participant level to investigate how the dosage, subject matter, and delivery models of training shape internal career progressions, perceptions of upward mobility, and earnings changes. Third, given that ETP programs allow employers to choose the type of training they need, tracking and analyzing their training choices and satisfaction levels (both employer and trainee satisfaction) could generate very useful information for public education and training providers (from K-12 to bachelors' degree programs) to fill some significant curricula gaps and better align their courses and program offerings with the demand. Fourth, this study also builds a strong case for further research on state-level incumbent worker training programs across the country and in different labor market settings to see if the findings are generalizable to different regional and labor market contexts such as the pandemic-related recession. Fifth, similar research could be conducted with larger samples, more detailed datasets, and across longer time-frames to obtain more precision and a better sense of whether sustained investments over a long period of time have greater effects than one-off short-term investments.

Overall, we found compelling evidence that state-level programs that incentivize employers to train their workforce show promise for addressing employer-driven concerns about skills gaps, stimulating job creation and upward mobility, increasing competitiveness, and creating a stronger culture of lifelong learning within the workplace. As such, these programs appear an important policy tool for states to consider and pilot to prepare for the future of work.

References

Acemoglu, D. & Autor, D., 2011. Skills, tasks and technologies: Implications for employment and earnings. In *Handbook of labor economics* (Vol. 4, pp. 1043-1171). Elsevier.

Bishop, J.H. 1995. "Do Most Employers and Workers Underinvest in Training and Learning on the Job?" In *What Makes Workers Learn: The Role of Incentives in Workplace Education and Training,* D. Hirsh and D.A. Wagener, eds. Cresskill, New Jersey: Hampton Press, Inc.

Deloitte & The Manufacturing Institute. 2018. "2018 Deloitte and The Manufacturing Institute skills gap and future of work study." Deloitte Development LLC. Accessed 25 February 2020 from: https://www2.deloitte.com/us/en/pages/manufacturing/articles/future-of-manufacturing-skills-gap-study.html.

Hollenbeck, K., 2008. "Is there a role for public support of incumbent worker on-the-job training?' Upjohn Institute Working Paper, No. 08-138, W.E. Upjohn Institute for Employment Research, Kalamazoo, MI. Accessed 25 February 2020 from: http://dx.doi.org/10.17848/wp08-138.

Hollenbeck, K. & Klerk, S.M., 2007. Evidence about the Effectiveness of Public Training Programs for Incumbent Workers. *Employment Research Newsletter*, 14(2), p.1. https://doi.org/10.17848/1075-8445.14(2)-1.

Howell, D.R. & Kalleberg, A.L., 2019. Declining job quality in the United States: Explanations and evidence. *RSF: The Russell Sage Foundation Journal of the Social Sciences*, 5(4), pp.1-53.

Lynch, L.M., 1992. "Strategies for Workplace Training: Lessons from Abroad." Washington, D.C.: Economic Policy Institute.

Moore, R. W., Blake, D. R., Phillips, G. M., & McConaughy, D., 2003. "Training That Works: Lessons from California's Employment Training Panel Program." Kalamazoo, MI: W.E. Upjohn Institute for Employment Research.

Stewart, T.A., Farren, D., Gootman, M., Ross, M., 2017. "Help Wanted: How Middle Market Companies Can Address Workforce Challenges to Find and Develop the Talent They Need to Grow." Washington, DC: The National Center for the Middle Market and the Brookings Metropolitan Policy Program. Accessed 25 February 2020 from: http://www.middlemarketcenter.org/Media/Documents/how-to-find-and-develop-middle-market-company-employees_NCMM_Workforce_Development_FINAL_web.pdf.

Weil, D., 2014. *The fissured workplace*. Harvard University Press.

World Economic Forum, 2017. "Accelerating Workforce Reskilling for the Fourth Industrial Revolution: An agenda for Leaders to Shape the Future of Education, Gender and Work." Geneva, Switzerland: World Economic Forum. Accessed 25 February 2020 from: http://www3.weforum.org/docs/WEF_EGW_White_Paper_Reskilling.pdf.

Technical Appendix

We used propensity score matching to estimate the impacts of ETP funding. In propensity score matching, one or more comparison group companies are selected to match each treatment group company based on a set of matching variables. For this analysis, we used the following matching variables:

- Age of the company (measured as the number of years passed since the company's founding until 2017)
- Pre-participation size (an average of the number of employees for the three available pre-participation years-2013, 2014, and 2015)
- Pre-participation sales (an average of the sales for the three available pre-participation years-2013, 2014, and 2015)
- Industry group (using two-digit SIC classification codes). To ensure balanced groups, three SIC Divisions—Agriculture, Forestry, and Fishing; Mining; Transportation, Communications, Electric, Gas, And Sanitary Services; and Finance, Insurance, And Real Estate-were grouped together and labeled as "Other".
- Region of the state where the company was located. We used the California Economic Markets (Coastal, Eastern Sierra, Northern, Sacramento, San Francisco Bay Area, San Joaquin Valley, Southern, and Southern Border) developed by the California Employment Development Department (https://www.labormarketinfo.edd.ca.gov/geography/regional-economic-profiles.html). To ensure balanced groups, the Northern region was added to the Sacramento region and the Coastal region was added to the San Francisco Bay Area region.
- For select models, we also used a matching variable that measured whether employment was trending upward or downward during the pre-intervention years (2013-2015), which improved covariate balance for those models.

D&B data measures employment in two ways: number of employees at the site being funded by ETP (in the case a company has several sites, or branches); and the total number of employees. We computed an impact estimate for each of these outcomes, as well as for yearly sales. All impact estimates are obtained as differences in regression-adjusted outcomes between the treatment and the matched comparison groups and are expressed in percentage points increase:

$$\frac{t-c}{c} * 100,$$

where t represents the regression-adjusted treatment group mean and c represents the matched comparison group regression-adjusted mean.

All the variables used in the analyses had a small amount of missing data. Cases with missing data in either the matching characteristics or the outcomes were dropped from the analyses.

In a quasi-experimental impact design based on propensity score matching, the quality of matching (i.e., the ability to match treatment and comparison groups very closely on pre-intervention characteristics, otherwise known as covariate balance) is crucial. For each analysis, we tested many models; only the ones with the highest matching quality were included in the report. We used standardized mean differences and variance ratios for matching covariates, both before and after matching, to judge the quality of matching (well-balanced covariates should have a standardized mean difference that is close to zero and a variance ratio that is close to one).

In some cases, inverse probability weighting (IPW) was preferred to propensity score matching for estimating impacts. Rather than selecting a group of matched comparison cases for each treatment unit, IPW utilizes the entire comparison pool (i.e., it does not discard any comparison units from the analytic sample), but it weights the data such that comparison units that resemble the treatment units more receive a larger analytical weight.