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IN FOCUS

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Automation, Worker Training, and Federal Tax Policy

Technologies that partly or fully automate a variety of tasks are being used with increasing frequency in a range of industries and occupations. These technologies include robotics, machine learning, and other forms of artificial intelligence (AI). This increasing use of automation has fueled the concern that the substitution of machines for humans in a growing number of workplaces will result in massive job losses, especially for unskilled or low-skilled workers. Some predict that if such a scenario were to arise, many displaced workers would face a bleak future marked by fewer job opportunities at lower wages, long-term earnings losses, and poor health.

The worker-displacing potential of automation has given rise to a debate over what steps firms, governments, postsecondary schools, and other entities should take, if any, to help displaced workers find well-paying jobs that may or may not be linked to automation.

This In Focus looks at how federal tax policy might be used for that purpose. Specifically, it addresses the pros and cons of possible new business tax incentives to encourage employers to invest more in training their employees and to dissuade them from increasing automation investment. This overview does not address possible new tax incentives for individuals to acquire on their own the skills and knowledge they would need to find well-paying jobs.

Automation and Worker Displacement

The spread of workplace automation has raised many policy concerns in recent years. They include the jobs that are likely to disappear, the jobs that will be created, the wage effects of this churning automation's impact on how and where jobs are performed, and actions that employers and federal, state, and local governments might take to facilitate the transition of displaced workers to new jobs.

A number of studies have addressed these and other concerns. Of particular note is a 2020 paper by Daron Acemoglu and Pascual Restrepo on the impact of robots (narrowly defined) on U.S. employment and wages. The authors estimated that the addition of one robot for every 1,000 U.S. employees resulted in a slight decline in overall wages (0.42%) and the employment-to-population ratio (0.2 percentage points, which meant the loss of about 400,000 jobs) from 1993 to 2007. They also found that the declines varied by industry.

A broader perspective on the labor-saving potential of automation came from a 2019 report by the McKinley Global Institute. The study predicted that 49.1 million U.S. jobs might be lost because of automation from 2020 to 2030. But only one-third of those workers (14.9 million) would have to find jobs completely unrelated to their previous jobs; the other two-thirds (34.2 million) would likely fill jobs created by automation requiring new skills and knowledge. The study also estimated that low-wage workers were four times more likely to be displaced by automation in that decade than were highly paid workers.

Investment in Worker Training and Education

Investment in worker training and education is a key source of economic and productivity growth owing to its impact on human capital. In theory, both employees and employers reap benefits from this investment. Employees gain new skills and knowledge that they can use to obtain well-paying and more interesting jobs. Employers obtain a more productive, skilled, loyal, and motivated workforce.

Yet there is a possible employer downside to such investment in the form of a market failure. In general, such a failure refers to a condition that prevents or hinders economically efficient outcomes. In the case of employer investments in worker education and training, a market failure could arise when an employee transfers skills and knowledge he or she received from training from a former employer to another employer. Such a transfer allows the second employer to benefit from the enhanced human capital without bearing any of its cost. Economists regard these spillovers as a market failure because the inability of employers to capture all returns to their training and education investments is thought to lead them to invest too little in worker training and education relative to its overall economic benefits. Government subsidies might boost this investment to socially optimal levels.

Worker Training Investment and the Federal Income Tax

The federal income tax offers no targeted incentive for employers to invest in worker training. Internal Revenue Code (IRC) Section 162(a) permits businesses to deduct in full their "ordinary and necessary" expenses in the year they are paid or incurred in calculating their taxable income. Employee training expenses are among these expenses.

Some limits apply to employees who pay for classes on their own to improve their work skills and knowledge. In general, they may deduct the cost of the classes only if they are directly related to their current jobs.

Arguably, the federal tax code contains an implicit tax incentive for firms to invest in worker training. This incentive is known as expensing, which allows an employer to deduct the full amount of qualified training costs in the year they are incurred or paid. Expensing benefits employers by lowering the cost of capital for qualifying investments and boosting short-term cash flow—although

at the expense of reduced cash flow in the next several years.

While human capital's rate of depreciation is hard to measure, it seems reasonable to assume that the economic value from human capital created by worker education and training is not always used up in one year, as expensing presupposes. To the extent there is a gap between the useful life of human capital and one-year life under expensing, expensing would constitute a tax subsidy for employer investments in worker education and training.

In addition, there is a tax incentive for employers to directly and indirectly provide educational assistance to employees. IRC Section 127 permits an employee to exclude up to $5,250 a year in employer educational assistance that is provided under a written program. The cap has remained the same since 1986, and the program can include college-level courses and does not need to be job-related. Employers can deduct those costs only if they meet the criteria set forth in IRC Section 162(a).

Automation Investment and the Federal Income Tax

The federal tax code also provides no targeted incentive for businesses to invest in automation. But as with worker training, it implicitly encourages employer investment in automation through two expensing allowances. IRC Section 168(k) permits companies to deduct the full cost of certain assets (mostly software and equipment) in the year when they are placed in service. (This expensing option phases out between 2023 and 2026.) IRC Section 179 allows a company to expense up to $1.08 million in qualified assets placed in service in 2022. This allowance phases out dollar for dollar when the firm's total investment in those assets exceeds $2.7 million, a limitation that confines the allowance's benefits to small- and medium-sized firms. Those amounts are indexed for inflation.

Policy Issues

The question of how the federal government should respond to job market dislocations associated with automation has generated numerous policy proposals. Some would increase federal funding for job training tied to industry-based apprenticeships. Others would create new tax incentives to encourage greater employer investment in worker training for in-demand skills, and to discourage further use of automation. This section looks at proposed tax incentives.

Tax Incentives for Investment in Training

One idea that has gained support among some policymakers is a tax credit for increased employer spending on worker training. Bills to adopt such a proposal have been introduced in the 115th through 117th Congresses.

The efficacy and cost of such a credit hinges on its design and policy goals. Several design elements are key to a worker training credit's incentive effect.

One element concerns whether the credit should be incremental or flat. An incremental credit would apply to an employer's qualified training costs in a tax year above a base amount only. As such, it would incentivize employers to increase their worker training budgets, while managing the risk that firms would benefit from the credit for worker training investments they would undertake in any event.

An incremental credit's incentive effect would largely depend on both its statutory rate and how the base amount was determined. For example, companion bills in the 117th Congress (H.R. 2984 and S. 1422) would establish a 20% incremental credit for worker training expenses above a base amount that would equal an employer's average annual such expenses in the three previous years. This formula ties the base amount to a firm's recent worker training investments but dilutes the credit's incentive effect in the three years after an increase in this investment.

By contrast, a flat credit would apply to an employer's entire qualified training expenses in a tax year. As a result, a flat credit would be more generous to recipients than an incremental credit with the same statutory rate. A flat credit generally may be easier to administer and comply with than an incremental credit. The main argument against a flat credit is that it would subsidize worker training investments an employer would make in any event.

Other notable design considerations are whether a tax credit would apply to training expenses for all employees or only for low- or middle-wage employees, and the kinds of training programs that would qualify for the credit (e.g., industry apprenticeships or partnerships involving employers and educators).

Tax Incentives for Deterring Automation Investment

A more controversial approach to helping workers gain the knowledge and skills they would need for well-paying jobs at a time of increasing automation is to tax the use of automated technologies like robots. Proponents of such a tax claim that it would (1) protect current jobs by dissuading employers from replacing humans with robots for specific tasks; (2) curb the use of automation that does little to improve labor productivity; and (3) raise revenue that could pay for local, state, or federal training and reskilling programs for displaced workers.

Critics of such a tax say that it would do more economic harm than good. They cite evidence that firms adopting automated technologies hire more workers than comparable nonautomated firms. In their view, taxing robots and other forms of automation would have the undesirable effect of slowing domestic job and productivity growth. Then there is the difficult question of defining the automated technologies that would be taxed. Some say that the answer would be controversial, as some firms investing in automation might pay more in taxes than others making similar investments.

No bills to deter automation through the federal tax code have been introduced in the 117th Congress.

Gary Guenther, Analyst in Public Finance

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